Bids to be opened at 2:00 P.M.
on December 23, 2025
at Marina Coast Water District
920 2nd Avenue
Marina, California 93933

# SPECIFICATIONS

## MARINA COAST WATER DISTRICT

## RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT
## CIP GW-2404GN

**DISTRICT BOARD**

Jan Shriner, President

| | |
|---|---|
| Herbert Cortez | Thomas Moore, Ph.D. |
| Gail Morton | Matt Zefferman |

**APPROVED BY:**

_____

Jack Gao, PMP, Senior Project Manager, Marina Coast Water District

**PREPARED BY:**

Wallace Group
San Luis Obispo, California

November 20, 2025

## CERTIFICATION

In accordance with the provisions of Section 6735 of the Business of Professions Code of the State of California, these specifications have been prepared by or under the direction of the following Professional Engineers licensed in the State of California.

**Zachary C. Markow** **November 20, 2025**
**License #92952**



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**MARINA COAST WATER DISTRICT**
Monterey County, California

**RESERVATION ROAD DESAL PLANT RENOVATION PROJECT**
**CIP GW-2404GN**

The work embraced herein is shown on a set of plans for the rehabilitation, renovation, and replacement of existing desalination plant infrastructure, entitled "**RESERVATION ROAD DESAL PLANT RENOVATION PROJECT, CIP GW-2404GN",** dated November 20, 2025.

The work, as indicated by the Plans shall be done in accordance with the Supplementary Conditions, Technical Specifications, and the Contract annexed hereto, including the General Conditions, and also in accordance with the MCWD Standard Specifications and the Standard Specifications 2025 of the State of California, Department of Transportation, referred to herein as the "State Standard Specifications", which are hereby incorporated by reference.

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**MARINA COAST WATER DISTRICT**
**MARINA, CA**
**CIP #GW-2404GN**
**RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT**

INVITATION TO BIDDERS

Sealed Bids for the construction of the **RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT** will be received by the Marina Coast Water District (herein after referred to as MCWD), at **920 Second Avenue, Marina, CA 93933,** until **2:00PM** local time on **Tuesday, December 23, 2025**, at which time the Bids received will be publicly opened and read. The Project consists of the following work:

**CIP GW-2404GN:**

1. Installation of Replacement Intake Well Pump, Piping, and Vault:
    a. Intake well pump shall be furnished by the District and installed in existing Intake Well by Contractor.
    b. Furnish and install replacement intake well vault, including all necessary earthwork and pre-cast vault base.
    c. Furnish and install replacement Schedule 80 PVC well discharge piping, including all fittings and appurtenances, as shown in the Plans and in compliance with the District Standard Specifications and these Technical Specifications.
2. Pipe Inspection and Testing:
    a. Inspection and pressure testing of existing intake supply and brine discharge piping.
3. Replacement Intake Well and Brine Discharge Piping:
    a. Furnish and install approximately 200 LF of 6" DR 13.5 HDPE pipe from the intake well piping to the connection with the existing 12" C900 PVC supply line, as shown in the Plans.
    b. Installation of approximately 15 LF of 6" Schedule 80 PVC at the existing Desalination Plant building.
    c. Installation of approximately 150 LF of 8" Schedule 80 PVC pipe from the existing brine discharge line to the existing discharge well, including all fittings, valves, appurtenances, and wellhead connection, as well as the location and condition assessment of existing brine discharge pipeline.
4. Replacement Electrical Systems:
    a. Removal of existing switchgear and installation of Owner-furnished replacement switchgear, including coordination with Owner for delivery of replacement switchgear to the Project Site.
    b. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances required to connect replacement intake well pump to replacement switchgear as shown in the Plans.
    c. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances as shown in the Plans, for the intake and discharge well level transducers, flow meter, pressure transducers, and pressure switch.
    d. Furnish and install level transducers in the rehabilitated intake and injection wells, as shown in the Plans.

**CIP GW-2404GN BID ALTERNATIVES:**

1. Full Replacement of Intake Supply Line:
    a. Abandon existing 12" C900 PVC intake well supply line and replace with 12" DR 13.5 HDPE water main in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 450 LF of 12" DR 13.5 HDPE pipe. This includes the utility location and potholing at all crossings.
2. Full Replacement of Brine Discharge Line:
    a. Remove and replace existing 8" brine discharge line with 8" Schedule 80 PVC pipe in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 225 LF of 8" Schedule 80 PVC pipe. This includes the utility location and potholing at all crossings.
3. Well Rehabilitation:
    a. Rehabilitation of three (3) existing groundwater monitoring wells located on the Owner's existing desalination plant property.
    b. Intake Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents, including the construction and maintenance of a temporary, unpaved access road to the existing intake well located on Marina State Beach property.
    c. Discharge Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents.

Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis, with additive alternate bid items as indicated in the Bid Form.

The Issuing Office for the Bidding Documents is:
Marina Coast Water District – Engineering Office
920 Second Avenue, Suite A
Marina, CA 93933

Point of Contact:
Jack Gao
(831) 883 - 5962
jgao@mcwd.org

Prospective Bidders may examine the Bidding Documents at the Issuing Office on Mondays through Thursdays between the hours of 8:00 a.m. to 5:00 p.m. and may obtain copies of the Bidding Documents from the Issuing Office online at www.mcwd.org.

Hard copies of the Bidding Documents are not available for purchase; the Bidding Documents are only available as a free download from the Issuing Office website at www.mcwd.org. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office.

A pre-bid conference, including a site visit, will be held at **10:00am** local time on **Tuesday, December 2, 2025** at the MCWD Engineering Office, **920 Second Avenue, Suite A, Marina, CA 93933**. Attendance at the pre-bid conference is non-mandatory.

Bid security shall be furnished in accordance with the Instructions to Bidders.

The right is reserved, as the interest of MCWD may require, to reject any or all bids, to waive any informality in bids, and to accept or reject any items of the bid. If the Contractor's bid is accepted, the MCWD will execute the Contract as governed by Public Contract Code 22030 through 22045. The award of the contract, if it is to be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Such award, if made, will be made within **60** days after the bid opening, unless an extension is agreed to by the lowest responsible bidder.

The bidder and any of his subcontractors must be licensed as a **Class A General Engineering** Contractor with the Contractors State License Board of the State of California Department of Consumer Affairs. Bids will not be considered from contractors not licensed as a **Class A** unless they hold a specialty license for the specific classification(s) to be performed.

To be qualified to bid on, be listed in a bid proposal or engage in the performance of any public work contract subject to Labor Code section 1720, contractors and subcontractors must be registered with the Department of Industrial Relations. Please see http://www.dir.ca.gov/Public-Works/PublicWorks.html for more information. No contract will be entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. If awarded a contract, the bidder and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the project.

Public Works projects exceeding $1,000.00 require the payment of the general prevailing rate of per diem wages, copies of which are on file at the State of California, Department of Consumer Affairs Office. (Labor Code 1770, et seq.).

The MCWD contact person assigned to this project is: **Jack Gao**. All inquiries regarding the project shall be directed to MCWD at (831) 883-5962 (phone), (831) 384-0197 (fax), or jgao@mcwd.org (e-mail). Requests for information will be received in writing until **4:00p.m.** on **Tuesday December 16, 2025**.

| | |
|---|---|
| Owner: | **Marina Coast Water District** |
| By: | **Jack Gao** |
| Title: | **Senior Project Manager** |
| Date: | **November 20, 2025** |

+ + END OF INVITATION TO BIDDERS + +

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**ARTICLE 1 – DEFINED TERMS**

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued, which is the MCWD Engineering Office, 920 Second Avenue, Suite A, Marina, CA 93933.

**ARTICLE 2 – COPIES OF BIDDING DOCUMENTS**

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

**ARTICLE 3 – QUALIFICATIONS OF BIDDERS**

3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.

B. Bidder's state or other contractor license number, if applicable.

C. Subcontractor qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors and Others."

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

**ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE**

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

B. Access to the existing intake well and MCWD facilities located on Marina Dunes State Beach requires coordination with both the Owner and the California Department of Parks and Recreation (State Parks).

C. Contractor shall coordinate with the Agency having jurisdiction (City of Marina and/or State Parks) over the area in which the Work is to be performed.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:

a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

A. A site visit will be performed during the pre-bid meeting. If Contractor cannot attend the pre-bid meeting, Contractor shall coordinate a separate site visit with the Owner pursuant to Paragraph 4.03.C below.

B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

**ARTICLE 5 – BIDDER'S REPRESENTATIONS**

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

F. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

I. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

**ARTICLE 6 – PRE-BID CONFERENCE**

6.01 A non-mandatory pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

**ARTICLE 7 – INTERPRETATIONS AND ADDENDA**

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Owner in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received after March 5, 2025 may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

**ARTICLE 8 – BID SECURITY**

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 10% (ten percent) of Bidder's maximum Bid price (determined by adding the base bid and all alternates, if any) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract

Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

**ARTICLE 9 – CONTRACT TIMES**

9.01 The number of days within which, or the dates by which, the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement.

**ARTICLE 10 – LIQUIDATED DAMAGES**

10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

**ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS**

11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

**ARTICLE 12 – SUBCONTRACTORS AND OTHERS**

12.01 A Bidder shall be prepared to retain specific Subcontractors or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor or other individual or entity against which Contractor has reasonable objection.

12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner qualifications information for the Subcontractors proposed for the portions of the Work of which the Subcontractor will assume responsibility thereof.

If requested by Owner, such qualifications information shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.04 If the apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors or other individuals or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

**ARTICLE 13 – PREPARATION OF BID**

13.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.

13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.

13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.

13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.

13.07 All names shall be printed in ink below the signatures.

13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

**ARTICLE 14 – BASIS OF BID**

14.01 Base Bid with Alternates

A. Bidders shall submit a Bid on a lump sum basis for the total base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

14.02 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. 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.

14.03 *Allowances*

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02. B of the General Conditions.

B. If the Owner includes reimbursement allowances, the allowance value will be pre-entered in the Bid Form.

**ARTICLE 15 – SUBMITTAL OF BID**

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the

notation "BID ENCLOSED." A mailed Bid shall be addressed to Marina Coast Water District, 920 Second Avenue, Suite A, Marina, CA 93933, ATTN: District Engineer.

15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

**ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID**

16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

**ARTICLE 17 – OPENING OF BIDS**

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

**ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

**ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT**

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.03 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors proposed for those portions of the Work for which the identity of Subcontractors must be submitted as provided in the Bidding Documents.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors.

19.06 Bid Protests

A. Any bid protest must be in writing and received by District's District Engineer at 920 Second Avenue, Suite A, Marina, CA 93933 at or before 4:00 p.m. (local time) two (2) working days after bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

B. General. Only a bidder who has actually submitted a bid is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder but must timely pursue its own protest. For purposes of this Section 1.1, a "working day" means a day that District is open for normal business, and excludes weekends and holidays observed by District. Any untimely protest or protest submitted without the requisite bid protest fee will be returned to the protestor without further action.

C. Non-refundable Bid Protest Fee. The protesting bidder must submit the following non-refundable fee via cashier's check made payable to "Marina Coast Water District" to reimburse its costs to administer the bid protest:

1. Five Hundred Dollars ($500), where the protesting bidder's bid is less than $1,000,000;
2. One Thousand Dollars ($1,000), where the protesting bidder's bid is $1,000,000 or more but less than $5,000,000;
3. Two Thousand Dollars ($2,000), where the protesting bidder's bid is $5,000,000 or more.

This applicable fee must be submitted to District no later than the Bid Protest Deadline, unless otherwise specified in the District's bid solicitation documents. Failure to make timely payment shall result in the bid protest being rejected as being incomplete.

D. Protest Contents. The bid protest must state (a) all of the specific grounds for the protest, (b) the specific facts that support each ground, including but not limited to the specific provision(s) of the bid solicitation documents and the specific portion on

the face of the bid being protested that are the basis of the protest, and (c) must provide all supporting documentation. Additional grounds and supporting facts for the bid protest and documentation submitted after the Bid Protest Deadline will not be considered. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder. The protest must be signed and submitted under penalty of perjury.

E. Copy to Protested Bidder. The protesting bidder must be concurrently transmitted by fax or by email or by personal delivery by or before the Bid Protest Deadline, a copy of the protest and all supporting documentation to the bidder whose bid is being protested ("protested bidder") and to any other bidder who has a lower bid than the protesting bidder.

F. Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by District at or before 4:00 p.m., within two working days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation. Documentation submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder. The response must be signed and submitted under penalty of perjury.

G. Copy to Protesting Bidder. A copy of the response and all supporting documents must be concurrently transmitted by fax or by email or by personal delivery, by or before the Response Deadline, to the protesting bidder and any other bidder who has a lower bid than the protesting bidder.

H. Exclusive Remedy. The procedure and time limits set forth in this section are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a claim pursuant to the California Government Code or initiation of any other legal proceedings.

I. Right to Award. The District Engineer will review the bid protest for completion within a reasonable amount of time prior to the bid award. The District has the authority to issue a final determination on all bid protests. Possible actions by the District on any bid protest include (a) upholding the protest and awarding the bid to the next lowest responsible bidder, (b) rejecting the protest and awarding to the lowest responsible bidder, or (c) rejecting all bids. Nothing in this section shall be construed as a waiver of the District's right to reject all bids.

**ARTICLE 20 – BONDS AND INSURANCE**

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

**ARTICLE 21 – SIGNING OF AGREEMENT**

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver

the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

**ARTICLE 22 – SALES AND USE TAXES (NOT USED)**

**ARTICLE 23 – RETAINAGE**

23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Supplemental Conditions.

**ARTICLE 24 – PREVAILING WAGE**

24.01 Prevailing wage requirements are set forth in the Supplementary Conditions.

**END OF DOCUMENT**

# BID FORM

## CIP #GW-2404GN
## RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

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## ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

**Marina Coast Water District**

**920 Second Avenue, Suite A**

**Marina, CA 93933**

**ATTN: District Engineer**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

## ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

## ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

| Addendum No. | Addendum Date |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

**ARTICLE 4 – BIDDER'S CERTIFICATION**

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

**ARTICLE 5 – BASIS OF BID**

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

| Item No. | Description | Unit | Estimated Quantity | Bid Unit Price | Bid Price |
|---|---|---|---|---|---|
| **CIP GW-2404GN** | | | | | |
| 1 | Mobilization / Demobilization | 1 | LS | | |
| 2 | Construction Survey | 1 | LS | | |
| 3 | Erosion, Sediment, and Water Pollution Control | 1 | LS | | |
| 4 | Traffic Control | 1 | LS | | |
| 5 | Sheeting, Shoring, and Bracing | 1 | LS | | |
| 6 | Intake Well Access Road and Pad Grading | 1 | LS | | |
| 7 | Intake Well Pump, Vault, and Piping | 1 | LS | | |
| 8 | Site Electrical Improvements | 1 | LS | | |
| 9 | Connection to Existing Piping | 2 | EA | | |
| 10 | 6" HDPE Intake Piping | 200 | LF | | |
| 11 | 8" PVC Discharge Piping | 150 | LF | | |
| 12 | Desalination Plant Yard Piping | 1 | LS | | |
| 13 | Discharge Wellhead Piping | 1 | LS | | |
| **Total of All Lump Sum Bid Items** | | | | | $ |
| **Total of All Unit Price Bid Items** | | | | | $ |
| **Total Bid Price** | | | | | $ |

| BID ALTERNATIVES | | | | | |
|---|---|---|---|---|---|
| **Item No.** | **Description** | **Unit** | **Estimated Quantity** | **Bid Unit Price** | **Bid Price** |
| ALT 1 | Remove and Replace 12" Intake Well Pipe | 450 | LF | | |
| ALT 2 | Remove and Replace 8" Brine Discharge Pipe | 225 | LF | | |
| ALT 3 | Well Rehabilitation | 1 | LS | | |

ALW = Allowance, CF = Cubic Foot, CY = Cubic Yard, DY = Day, EA = Each, HR = Hour, LF = Linear Foot, LS = Lump Sum, SF = Square Foot, SY = Square Yard

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

**Total of Lump Sum and Unit Price Bids = Total Bid Price** $ _____

**ARTICLE 6 – TIME OF COMPLETION**

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

**ARTICLE 7 – ATTACHMENTS TO THIS BID**

7.01 The items listed in Document 00 43 93, Bid Submittal checklist, are submitted with and made a condition of this Bid.

**ARTICLE 8 – DEFINED TERMS**

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

**ARTICLE 9 – BID SUBMITTAL**

9.01 See next page for submittal form.

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
*[Signature]* _____

*[Printed name]* _____

*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:
*[Signature]* _____

*[Printed name]* _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's Contractor License No.: _____

(where applicable)

# BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name, and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:
Marina Coast Water District
920 Second Avenue, Suite A
Marina, CA 93933

BID

Bid Due Date: *Tuesday, December 23, 2025*

Description: The Work includes rehabilitation of existing desalination plant facilities within the Marina Coast Water District (MCWD) service boundary, in the specific locations shown in the Plans. This Work will include coordination with MCWD, the City of Marina, and the California Department of Parks and Recreation. A summary of the Work is as follows:

*A. Scope of Work:*
1. *Installation of Replacement Intake Well Pump, Piping, and Vault:*
    a. *Intake well pump shall be furnished by the District and installed in existing Intake Well by Contractor.*
    b. *Furnish and install replacement intake well vault, including all necessary earthwork and pre-cast vault base.*
    c. *Furnish and install replacement Schedule 80 PVC well discharge piping, including all fittings and appurtenances, as shown in the Plans and in compliance with the District Standard Specifications and these Technical Specifications.*
2. *Pipe Inspection and Testing:*
    a. *Inspection and pressure testing of existing intake supply and brine discharge piping.*
3. *Replacement Intake Well and Brine Discharge Piping:*
    a. *Furnish and install approximately 200 LF of 6" DR 13.5 HDPE pipe from the intake well piping to the connection with the existing 12" C900 PVC supply line, as shown in the Plans.*
    b. *Installation of approximately 15 LF of 6" Schedule 80 PVC at the existing Desalination Plant building.*
    c. *Installation of approximately 150 LF of 8" Schedule 80 PVC pipe from the existing brine discharge line to the existing discharge well, including all fittings, valves, appurtenances, and wellhead connection, as well as the location and condition assessment of existing brine discharge pipeline.*
4. *Replacement Electrical Systems:*
    a. *Removal of existing switchgear and installation of Owner-furnished replacement switchgear, including coordination with Owner for delivery of replacement switchgear to the Project Site.*

*b. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances required to connect replacement intake well pump to replacement switchgear as shown in the Plans.*

*c. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances as shown in the Plans, for the intake and discharge well level transducers, flow meter, pressure transducers, and pressure switch.*

*d. Furnish and install level transducers in the rehabilitated intake and injection wells, as shown in the Plans.*

*B. Bid Alternates : As identified in the Bid Schedule, bid alternate items include:*

*1. Full Replacement of Intake Supply Line:*

*a. Abandon existing 12" C900 PVC intake well supply line and replace with 12" DR 13.5 HDPE water main in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 450 LF of 12" DR 13.5 HDPE pipe. This includes the utility location and potholing at all crossings.*

*2. Full Replacement of Brine Discharge Line:*

*a. Remove and replace existing 8" brine discharge line with 8" Schedule 80 PVC pipe in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 225 LF of 8" Schedule 80 PVC pipe. This includes the utility location and potholing at all crossings.*

*3. Well Rehabilitation:*

*a. Rehabilitation of three (3) existing groundwater monitoring wells located on the Owner's existing desalination plant property.*

*b. Intake Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents, including the construction and maintenance of a temporary, unpaved access road to the existing intake well located on Marina State Beach property.*

*c. Discharge Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents.*

**BOND**

Bond Number:
Date:
Penal sum _____ $ _____
(10% (ten percent) of the Total Bid Value, in Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

| **BIDDER** | **SURETY** |
|---|---|
| _____ (Seal) | _____ (Seal) |
| Bidder's Name and Corporate Seal | Surety's Name and Corporate Seal |
| By: _____ | By: _____ |
| Signature | Signature (Attach Power of Attorney) |
| _____ | _____ |
| Print Name | Print Name |
| _____ | _____ |
| Title | Title |
| Attest: _____ | Attest: _____ |
| Signature | Signature |
| Title | Title |

*Note: Addresses are to be used for giving any required notice.*
*Provide execution by any additional parties, such as joint venturers, if necessary.*

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

**BID SUBMITTAL CHECKLIST**

All information required by the terms of the Bid Documents must be furnished. Important items to be submitted are including, but not limited to, those listed below:

ARTICLE 1 - SUBMIT WITH BID

| | Form Number | Form Name |
|---|---|---|
| ☐ | 00 41 00 | Bid Form |
| ☐ | No form included | Certificate of Contractor's License |
| ☐ | 00 43 00 | Bid Bond (or Bid Security) |
| ☐ | 00 43 93 | Bid Submittal Checklist (this page) |
| ☐ | 00 45 12 | List of Project References |
| ☐ | 00 45 14 | Designation of Subcontractors |
| ☐ | 00 45 18 | Designation of Insurance Agent or Broker |
| ☐ | 00 45 20 | Stop Notice Information |
| ☐ | 00 45 22 | Non-Collusion Statement |
| ☐ | 00 45 24 | Prevailing Wage Statement |
| ☐ | 00 45 26 | Public Works Contractor Registration Certification |
| ☐ | 00 45 28 | Local Hiring for Public Works |
| ☐ | 00 45 30 | Iran Contracting Act Certification |

ARTICLE 2 – SUBMIT PRIOR TO OWNER'S EXECUTION OF CONTRACT (After Notice of Award)

| | | |
|---|---|---|
| ☐ | 00 52 00 | Agreement |
| ☐ | 00 61 00 | Performance Bond |
| ☐ | 00 61 50 | Payment Bond |
| ☐ | No form included | Insurance Certificates |

**END OF DOCUMENT**

## LIST OF PROJECT REFERENCES

RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT
CIP #GW-2404GN

*SUBMIT WITH BID*

The Bidder shall provide three projects that they have successfully completed in the last ten years of like nature and equaling $800,000, or greater, in total value. The Bidder shall provide the project name, owner representative and phone number. The projects listed shall be of similar scope and type as the project identified in this document.

| | Project Name | Owner Representative | Owner Phone / Email Address | Contract Amount |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

**END OF DOCUMENT**

**DESIGNATION OF SUBCONTRACTORS**

RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

*SUBMIT WITH BID*

In compliance with the provisions of Sections 4100-4113 of the Public Contract Code of the State of California, and any amendments thereof, and, if applicable, with the requirements of County relating to projects for the construction, improvement or repair of Public Works, the undersigned bidder has set forth below the name and location of the place of business of each subcontractor who will perform work or labor or render service to the undersigned in or about the construction of the work, and each subcontractor who, under subcontract, will specially fabricate and install a portion of the work or improvement according to detailed drawings contained in the plans and specifications, for such work to be performed under the Contract Documents to which the attached bid is responsive, and the portion of the work which will be done by each subcontractor and for each subcontract in excess of one half of one percent of the undersigned's total aggregate bid.

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Attach additional sheets, as needed.

COMPANY NAME: _____

By: _____
Bidder's Signature

Date: _____

**END OF DOCUMENT**

**DESIGNATION OF INSURANCE AGENT OR BROKER**

RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

*SUBMIT WITH BID*

It is proposed that the following insurance agent/broker and insurance company will provide policies of insurance or insurance certificates as required by the bid documents.

Insurance Agent or Broker: _____

Street: _____

City, State and Zip: _____

Telephone: _____

Name of Insurance Company
Providing Coverage _____

Best's Key Rating Guide of at least A VII? Yes _____ No _____

It is proposed that the following bonding agent or surety will provide payment and performance bonds as required by the bid documents.

Bonding Agent or Broker: _____

Street: _____

City, State and Zip: _____

Telephone: _____

Name of Surety Company
Providing Bonds: _____

1. Admitted in California? Yes _____ NO _____

*OR*

Current Treasury Listed Surety (Federal Register)? Yes _____NO _____

*AND*

Current A.M. Best B or better rating? Yes _____NO _____

2. (in lieu of 1)

An admitted surety insurer which complies with the provisions of the code of Civil Procedure, Section 995.660*.

California Code of Civil Procedure Section 995.660 in summary, states that an admitted surety must provide 1) the original, or a certified copy of instrument authorizing the person who executed the bond to do so; 2) a certified copy of the Certificate of Authority issued by the Insurance Commissioner, 3) a certificate from county Clerk of Monterey County that Certificate of Authority has not been surrendered, revoked, canceled, annulled or suspended; 4) a financial statement showing the assets and liabilities of the insurer at the end of the quarter calendar year, prior to 30 days next preceding the date of the execution of the bond.

OR

3. In lieu of 1 and 2, a company of equal financial size and stability that is approved by the MCWD Insurance/Risk Manager.

By signing below, the bidder certifies that:

The above comply with the MCWD standards for liability insurers and sureties pursuant to Article 6 of the General and Supplementary Conditions: Yes _____ NO _____. If "No", your bid is subject to rejection.

COMPANY NAME: _____

BY: _____
(Bidder's signature)

DATE: _____

**END OF DOCUMENT**

**STOP NOTICE INFORMATION**

*SUBMIT WITH BID*

PROJECT NAME: RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

CONTRACTOR'S NAME AND ADDRESS: _____

_____

_____

Reference: California Civil Code, Division 3, Part 4, Title 15, Chapter 4

The following is provided for the information of contractors, subcontractors and suppliers of labor, materials, equipment, and services under MCWD contracts, and is not intended as legal advice. Advice of legal counsel should be obtained to ensure compliance with legal requirements relating to public works stop notices.

WHERE TO FILE: All original stop notices and preliminary-20 day notices (if required by California Civil Code 53098) must be filed with the Marina Coast Water District, 920 Second Avenue, Suite A, Marina, CA 93933.

STOP NOTICE CONTENTS: See California Civil Code 3103. written notice, signed and verified by the claimant and including information such as the kind of labor, equipment, materials or service furnished or agreed to be furnished by the claimant; the name of the person/entity to or for whom the same was done or furnished; the amount in value of that already done or furnished and/or agreed to be done or furnished. Blank stop Notice forms are commercially available.

WHO MAY SERVE STOP NOTICE: See California Code 53181. All persons furnishing labor, materials, equipment or services to the job (except the original contractor) and persons furnishing provisions, provender or other supplies.

HOW THE STOP NOTICE IS SERVED: See California Code S3103. Served by personal service, registered mail, or certified mail.

TIME FOR SERVICE: See California Civil Code 3184. Stop notices must be served before the expiration of 30 days after the recording of a Notice of Completion (sometimes referred to as a Notice of Acceptance) or Notice of Cessation, if such notice is recorded or if no Notice of Completion or Notice of Cessation is recorded, 90 days after actual completion or cessation.

NOTICE OF PUBLIC ENTITY (OWNER): See California Civil Code 3185. Provided that a stop notice claimant has paid to the Clerk of the Board of Supervisors the sum of $2.00 at the time of filing a stop notice, the Clerk shall provide each stop notice claimant with notice of filing of a Notice of

Completion or after the cessation of labor has been deemed a completion of a public work or after the acceptance of completion, whichever is later, to each stop notice claimant, by personal service or registered or certified mail.

RELEASE OF STOP NOTICE: See California Civil Code 3196 and following. A stop notice can be released if the original contractor files a corporate surety bond with the Clerk of the Board of Supervisors, in the amount of 125% of the stop notice claim. Alternatively, the original contractor may file an affidavit pursuant to California Civil Code S3198, stating objections to the validity of the stop notice. A counter affidavit may be filed by the claimant pursuant to 53200 and a summary legal proceeding may be held pursuant to 3201 and following, to determine the validity of the stop notice. If no counter affidavit is filed, the stop notice funds shall be released. Alternatively, the Stop Notice claimant may file a Release in a form which substantially complies with California Civil Code 3262.

STOP NOTICE LAWSUIT: See California Civil Code 53210 through 3214. These sections provide that a stop notice is perfected only by the filing of a lawsuit. A lawsuit must be filed no sooner than 10 days after service of a stop notice and no later than 90 days after the expiration of the time for filing stop notices. Notice of suit must be given to the Clerk of the Board within 5 days after commencement. The Court has the discretionary right to dismiss the lawsuit if it is not brought to trail within two years.

I HEREBY ACKNOWLEDGE THAT I RECEIVED AND READ THE ABOVE STOP NOTICE INFORMATION AND IF I AM AWARDED THIS CONTRACT, I AGREE TO INCLUDE A COPY OF THIS PAGE IN ALL SUBCONTRACTS AND CONTRACTS FOR LABOR, MATERIALS, EQUIPMENT, AND SERVICES THAT I ENTER INTO FOR THIS PROJECT:

Bidder's Signature: _____

Bidder's Name and Title (Print): _____

Date: _____

**END OF DOCUMENT**

**NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER**

RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

*SUBMIT WITH BID*

I, _____, am the
(name)

_____ of _____,
(Position Title) (Company)

the party 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 the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid; and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; 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 the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, 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.

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

_____ _____

**Signature** **Date**

**END OF DOCUMENT**

**PREVAILING WAGE STATEMENT**

*SUBMIT WITH BID*

If awarded the contract, we and our subcontractors shall pay all the workers we assign to the project not less than the prevailing wage as determined by the state of California, Director of Industrial Relations in compliance with Article 7 of the Supplementary Conditions. We are aware that the contractor shall be penalized for non-compliance by either the contractor or his subcontractor(s).

In addition, we are informed of the following:

Copies of the prevailing wage rates are on file at:

Marina Coast Water District
920 Second Avenue, Suite A
Marina, CA 93933

or
State of California Department of Industrial Relations
Division of Labor Statistics and Research
455 Golden Gate Avenue, 10th Floor
San Francisco, CA 94104
(415) 703-4774
On-line at https://www.dir.ca.gov/oprl/DPreWageDetermination.htm

The successful bidder shall be required to post the prevailing wage determinations at each job site.

Each contractor and subcontractor shall keep accurate payroll records showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per them wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection the public work.

Certified copies of such payroll records must be furnished to the State Department of Industrial Relations electronically. Certified copies of such payroll records must be furnished to the Marina Coast Water District upon request.

*By signing below, the bidder certifies that he shall comply with the prevailing wage laws.*

Company Name: _____

Bidder's Signature: _____

Date: _____

**END OF DOCUMENT**

**PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION**

*SUBMIT WITH BID*

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See http://www.dir.ca.gov/Public-Works/PublicWorks.html for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and the bidder and all bidder's subcontractors are currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Bidder further acknowledges:

1. Bidder shall maintain a current DIR registration for the duration of the project.

2. Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.

3. Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Bidder's Signature: _____

Bidder's Name and Title: _____

Firm: _____

Date: _____

**END OF DOCUMENT**

**LOCAL HIRING FOR PUBLIC WORKS**

*SUBMIT WITH BID*

This contract is for a Marina Coast Water District public works project. All Contractors and Subcontractors are required to comply with all of the provisions of Ordinance 53 Local Hiring (Chapter 2.10 of the District Code). Failure to comply with the local hiring ordinance may subject the Contractor herein with disqualification from any future Marina Coast Water District public works contracts.

The Bidder hereby certifies that (initial as applicable):

_____ Bidder has read Ordinance 53, Local Hiring for District Public Works, and

_____ Bidder can meet the local hiring requirements of Ordinance 53, or

_____ Bidder has made a good faith effort to meet the requirements of Ordinance 53 as documented on the attached pages, and anticipates a total of _____ percent of the workforce will be residents of the Monterey Bay Area, or

_____ Bidder requires an exception because a suitable pool of persons does not exist locally for the specialized skills listed below. These workers will constitute ____ percent of the workforce.

| **Specialized Skill** | **No. of Workers** | **County of Residence** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Company Name: _____

Contractor's Signature: _____

Date: _____

**Efforts to Hire Employees (submit only if needed)**

| Classification | Agency Contacted | Date | Results |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Efforts to Hire Subcontractors (submit only if needed)**

| Work Item | Company Contacted | Date | Results* |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

* Standard codes: DNR-did not respond, NA-not available for job, NB-not bidding, USED-included in bid, HIGH-selected lower cost bid

**END OF DOCUMENT**

**IRAN CONTRACTING ACT CERTIFICATION**

*SUBMIT WITH BID*

Reference: Public Contract Code Section 2200 et seq.

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 et seq.) is true and correct:

☐ The Contractor is not:

(i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(ii) a financial institution that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

☐ MCWD has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, MCWD will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

☐ The amount of the Contract payable to the Contractor for the Project does not exceed $1,000,000.

Bidder's Signature: _____

Bidder's Name and Title: _____

Firm: _____

Date: _____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

**END OF DOCUMENT**

# AGREEMENT
# BETWEEN MARINA COAST WATER DISTRICT
# AND CONTRACTOR
# FOR
# RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

THIS AGREEMENT is by and between Marina Coast Water District ("Owner") and _____ ("Contractor").

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

**ARTICLE 2 – THE PROJECT**

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT.

**ARTICLE 3 – ENGINEER**

3.01 The part of the Project that pertains to the Work has been designed by WALLACE GROUP, 612 CLARION CT, SAN LUIS OBISPO, CA 93401.

3.02 The Owner has retained WALLACE GROUP ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The Work will be substantially completed within **90** calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **150** calendar days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the

delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $,1000 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

4.04 *Special Damages*

A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.

B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

**ARTICLE 5 – CONTRACT PRICE**

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

**ARTICLE 6 – PAYMENT PROCEDURES**

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the

requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract:

   a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

   b. 0 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

**ARTICLE 7 – INTEREST**

7.01 All amounts not paid when due shall bear interest at the rate of 2 percent per annum.

**ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; and the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures

of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

E. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

F. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

I. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

**ARTICLE 9 – CONTRACT DOCUMENTS**

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement.
2. Performance bond.
3. Payment bond.
4. General Conditions.
5. Supplementary Conditions.
6. Specifications as listed in the table of contents of the Project Manual.
7. Drawings (not attached but incorporated by reference) .
8. Addenda (numbers 1 to ___, inclusive).
9. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (Document 00 41 00).
    b. Contractor's Representations (Documents 00 45 12 to 00 45 30, as included in the Bid)
10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.

11. The standard Plans and Specifications of the Marina Coast Water District, dated November 2007 (not attached but incorporated by reference).

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

**ARTICLE 10 – MISCELLANEOUS**

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

A. Owner stipulates that the General Conditions that are made a part of this Contract are the EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, with modifications made solely in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

| OWNER: | CONTRACTOR: |
|---|---|
| _____ | _____ |
| By: _____ | By: _____ |
| Title: General Manager | Title: _____ |
| | *(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)* |
| Attest: _____ | Attest: _____ |
| Title: _____ | Title: _____ |
| Address for giving notices: | Address for giving notices: |
| Marina Coast Water District | _____ |
| 920 Second Avenue, Suite A | _____ |
| Marina, CA 93933 | _____ |
| | License No.: _____ *(where applicable)* |

# PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:
Marina Coast Water District
920 Second Avenue, Suite A, Marina, CA 93933

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

| **CONTRACTOR AS PRINCIPAL** | **SURETY** |
|---|---|
| _____ *(seal)* | _____ *(seal)* |
| Contractor's Name and Corporate Seal | Surety's Name and Corporate Seal |
| **By:** _____ | **By:** _____ |
| Signature | Signature *(attach power of attorney)* |
| _____ | _____ |
| Print Name | Print Name |
| _____ | _____ |
| Title | Title |
| **Attest:** _____ | **Attest:** _____ |
| Signature | Signature |
| _____ | _____ |
| Title | Title |

***Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.***

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of

action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

# PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address):*
Marina Coast Water District
920 Second Avenue, Suite A, Marina, CA 93933

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

_____ *(seal)*
Contractor's Name and Corporate Seal

**By:** _____
Signature

_____
Print Name

_____
Title

**Attest:** _____
Signature

_____
Title

**SURETY**

_____ *(seal)*
Surety's Name and Corporate Seal

**By:** _____
Signature *(attach power of attorney)*

_____
Print Name

_____
Title

**Attest:** _____
Signature

_____
Title

***Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.***

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,

      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

# DOCUMENT 00 72 00
# STANDARD GENERAL CONDITIONS
# OF THE CONSTRUCTION CONTRACT

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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**ARTICLE 1 – DEFINITIONS AND TERMINOLOGY**

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer


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has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.


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24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.


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37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.


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48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.


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3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

**ARTICLE 2 – PRELIMINARY MATTERS**

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and


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3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or


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computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

**ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,


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error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any 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).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.


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3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

**ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.


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2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.


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G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

**ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part


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by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.


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5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,


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c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after


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becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.


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5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.


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F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.


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**ARTICLE 6 – BONDS AND INSURANCE**

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is


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maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).


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4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result


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of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.


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6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).


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5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

8. allow for the waiver of the insurer's subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. not include a co-insurance clause.

11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. include performance/hot testing and start-up.

13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.


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6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the


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policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

**ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and


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guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) it has a proven record of performance and availability of responsive service; and

4) it is not objectionable to Owner.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.


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D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and


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2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.


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E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.


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O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work


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7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;


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2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. 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.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or


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exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to


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provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine 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 a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.


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8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.


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D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop


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Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

**ARTICLE 8 – OTHER WORK AT THE SITE**

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.


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8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.


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D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

**ARTICLE 9 – OWNER'S RESPONSIBILITIES**

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.


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9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during


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or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.


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B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

**ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an


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adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on


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the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under


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the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.


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B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

**ARTICLE 12 – CLAIMS**

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim


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submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

**ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable


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thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes


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other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.


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B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.


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**ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If 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, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to


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cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.


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B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will


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include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

**ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner 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, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:


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a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or


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e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount


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remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.


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E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of


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inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,


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including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

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


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E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

**ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,


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and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for


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expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

**ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

**ARTICLE 18 – MISCELLANEOUS**

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.


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18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.


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# SUPPLEMENTARY CONDITIONS

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## I. General

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, Document 00 72 00 (EJCDC® C-700, 2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

---

## II. Specific Items

### ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

*SC-1.01 Defined Terms*

SC-1.01.A.28 Add the following sentence to the end of Paragraph 1.01.A.29:

The Terms "Owner", "District" and "MCWD" shall be used interchangeably and shall have the same meaning.

### ARTICLE 2 – PRELIMINARY MATTERS

*SC-2.02 Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor four (4) copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

### ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

*SC-3.01 Intent*

SC-3.01.F Add the following new paragraphs immediately after Paragraph 3.01.E:

F. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:

1. Change Orders, Field Orders or Work Change Directives
2. Permits from Agencies having jurisdiction
3. Addenda
4. Supplementary Conditions (Document 00 73 00)

5. Technical Specifications (Divisions 01 to 48)
6. Drawings
7. Agreement (Document 00 52 00)
8. General Conditions (Document 00 72 00)
9. Contractor's Bid Forms (Documents 00 41 00 – 00 45 38)
10. Standard Specifications
11. Standard Plans (Drawings)
12. Reference Documents

G. With respect to the Drawings, the order of precedence shall be as follows:

1. Figures govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda, Change Orders, Field Orders or Work Change Directives govern over Contract Drawings, with the most recent governing over earlier changes
4. Contract Drawings govern over Standard Drawings
5. Contract Drawings govern over Shop Drawings

**ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

*SC--5.02 Use of Site and Other Areas*

SC-5.02.E Add the following new paragraph immediately after Paragraph 5.02.D

E. Contractor shall submit copies of all agreements made with property owners for property use related to this project such as material and/or equipment storage, material disposal, etc.

*SC-5.03 Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.B:

C. The following reports of explorations and tests of subsurface conditions at or adjacent to the Site are known to Owner:

1. Report dated January 13, 2024, prepared by EKI Environmental & Water, entitled: *"Review of Available Video Logs and Other Data on Former Desalination Plant Wells (EKI B60094.23)",* consisting of 13 pages. The Technical Data contained in such report upon whose accuracy Contractor may rely are those indicated in the definition of Technical Data in the General Conditions.

D. Contractor may examine copies of reports and drawings identified in SC 5.03.C that were not included with the Bidding Documents at Marina Coast Water District, Engineering Office, 2840 4th Avenue, Marina, CA 93933, during regular business hours, or may request copies from Engineer.

*SC-5.06 Hazardous Environmental Conditions*

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

SC 5.06.I Delete Paragraph 5.06.I in its entirety.

*SC-5.07 Environmental Reports*

Add the following new subparagraphs immediately before Article 6:

SC-5.07 Environmental Reports

A. Environmental Report(s) have been prepared for this project under the California Environmental Quality Act (CEQA), as listed below. Contractor shall familiarize himself with these reports and implement the applicable mitigation measures during construction as outlined therein.

1. Report dated *November 2005, prepared by Denise Duffy & Associates, Inc., Monterey, CA, entitled: "Initial Study / Negative Declaration for the Marina Station Property Annexation", consisting of 36 pages*.

B. Copies of reports itemized in SC-5.07.A that are not included with Bidding Documents may be examined at Marina Coast Water District, Engineering Office, 2840 4th Ave, Marina, CA 93933 during regular business hours. These reports are not part of the Contract Documents, but the controls and mitigation measures contained therein which are required for performance of the Work are incorporated therein by reference.

**ARTICLE 6 – BONDS AND INSURANCE**

*SC-6.02 Insurance—General Provisions*

SC-6.02.A Replace 6.02.A with the following text:

"Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions."

SC-6.02.B Delete the words "Owner or" in first sentence of 6.02.B.

SC-6.02.C Add the following paragraph immediately after Paragraph 6.02.C:

All insurance shall be provided on policy forms acceptable to the Owner (Accord Form 25-S or equivalent), signed by the insurer's representative. Such evidence shall include an original copy of the additional insured endorsement signed by the insurer's representative. Each policy shall contain a cross liability or severability of interest clause or endorsement.

SC-6.02.D Delete paragraph 6.02.D in its entirety.

SC-6.02.E Delete paragraph 6.02.E. and replace with following text:

"Failure of Owner to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance."

SC-6.02.I Delete paragraph 6.02I in its entirety.

*SC-6.03 Contractor's Insurance*

SC-6.03.C.7 Remove the following text:

"; or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent".

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

| | |
|---|---|
| State: | Statutory |
| Federal, if applicable (e.g., Longshoreman's): | Statutory |
| Employer's Liability: | |
| Bodily injury, each accident | $ 1,000,000.00 |
| Bodily injury by disease, each employee | $ 1,000,000.00 |
| Bodily injury/disease aggregate | $ 1,000,000.00 |
| Foreign voluntary worker compensation | Statutory |

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

| | |
|---|---|
| General Aggregate | $ 10,000,000.00 |
| Products - Completed Operations Aggregate | $ 5,000,000.00 |
| Personal and Advertising Injury | $ 5,000,000.00 |
| Each Occurrence (Bodily Injury and Property Damage) | $ 5,000,000.00 |

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

| | |
|---|---|
| Bodily Injury: | |
| Each person | $ 1,000,000.00 |
| Each accident | $ 1,000,000.00 |

Property Damage:

Each accident $ 1,000,000.00

4. Excess or Umbrella Liability:

Per Occurrence $ 1,000,000.00

General Aggregate $ 1,000,000.00

5. Contractor's Pollution Liability:

Each Occurrence $ 5,000,000.00

General Aggregate $ 10,000,000.00

☐ If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following:

a. City of Marina

b. California State Department of Parks and Recreation

7. Contractor's Professional Liability:

Each Claim $ 1,000,000.00

Annual Aggregate $ 2,000,000.00

8. All insurance maintained by the Contractor shall include coverage for work in and around areas of with munitions and explosives of concern, or claims, damage or injury which arise from munitions or explosives of concern.

9. Insurance coverage identified above may be satisfied with a combination of a primary policy and excess or umbrella policy.

*SC-6.05 Property Insurance*

SC-6.05.A.1 Add the following new subparagraph after subparagraph 6.05.A.1:

a. In addition to Owner, Contractor, and all Subcontractors, include as insureds the following:

1. City of Marina, CA

2. California State Department of Parks and Recreation

SC-6.05.A. Add the following to the list of items in Paragraph 6.05.A, as numbered items:

14. include by express endorsement coverage of damage to Contractor's equipment.

15. be payable to MCWD as trustee for the insureds as their interests may appear. Any insured loss shall be adjusted with MCWD as trustee.

16. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

    a. Grundfos 625S250 submersible vertical turbine pump, valued at $10,000.

*SC-186.07 Receipt and Application of Property Insurance Proceeds*

**ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

*SC-7.02 Labor; Working Hours*

SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:

1. Regular working hours will be *[here insert schedule of regular working hours]*
2. Owner's legal holidays are:
    a. New Year's Day
    b. Martin Luther King Day
    c. President's Day
    d. Memorial Day
    e. Independence Day
    f. Labor Day
    g. Veterans Day
    h. Thanksgiving Weekend (Thursday and Friday)
    i. Working Day immediately preceding Christmas Day
    j. Christmas Day

*SC-7.08 Permits*

SC-7.08 Add the following new subparagraph immediately after Paragraph 7.08.A:

B. The Owner shall provide the following permits:
    1. CEQA Notice of Exemption
    2. Right of Entry (ROE) to Marina State Beach

*SC-7.10 Laws and Regulations*

SC-7.10 Add the following new paragraphs immediately after Paragraph 7.10.C:

7.10.D. Public Contract Provisions

1. The Contractor is responsible for his own compliance, and is responsible for all Subcontractors' compliance, with all applicable sections of the California Labor Code regarding the payment of wages, the employment of apprentices, and hours of work, all

as set forth in Section 1170 through Section 1815 of that Code. Those requirements are set forth below.

2. Payment of Prevailing Wages

   a. Pursuant to Sections 1774 and 1775 of the Labor Code, unless the contract price is under $1,000.00, the Contractor and any subcontractor under him, shall pay not less than the general prevailing rate of per diem wages, including holiday and overtime pay, to all workmen employed in the execution of this Contract. Failure to so comply will result in a fine of $25.00 per day per violation, and the obligation to compensate each such employee the difference between the wage actually paid and the prevailing wage applicable to that employee's craft.

   b. Pursuant to Section 1773.2 of the California Labor Code, the District has on file at its principal office, copies of the prevailing rate of per diem wages for each craft, and classification or type of workman needed to execute the contract, and a copy shall be available to any interested party upon request.

   c. The Contractor shall obtain and post copies of the prevailing per diem wage rates at the job site during the term of this project.

   d. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor or subcontractor in connection with the project, and such other information as required by law, and such payroll records shall be certified and made available for inspection and release all in accordance with Labor Code Section 1776 and 8 California Code of Regulations Section 16000 et seq. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement). The Contractor shall file with the District certified copies of its and all its subcontractors' payroll records within thirty (30) calendar days after completion of each payroll period at no cost to the District.

   e. Pursuant to Section 1773.8 of the Labor Code, travel and subsistence payments shall also be paid to each workman needed to execute such work if such travel and subsistence payments are set forth in the applicable collective bargaining agreements and filed with the Department of Industrial Relations thirty (30) days prior to the call for bids.

   f. Unless the Contract amount is under $30,000 or will be completed in less than twenty (20) days (or if this Contract involves a specialty contractor under $2,000 or less than 5 days) the Contractor shall comply with Section 1777.5 regarding the employment of registered apprentices upon public works by hiring, and by requiring that all subcontractors hire apprentices at the wage rate and ratio required, if at all, and by requiring the contribution of funds to appreciable crafts or trades as applicable under Section 1777.5.

   g. The Contractor shall, as a penalty to the District, forfeit not more than two hundred dollars ($200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of the Department of

Industrial Relations for such work or craft in which such worker is employed for any public work done under this contract by the Contractor or by any subcontractor under the Contractor. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor. Labor Code Section 1775.

h. Required California Department of Industrial Relations provisions:

- 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)].
- No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

i. The Contractor certifies that the Contractor and all subcontractors for this public works project have been registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

j. The District shall not recognize any claim for additional compensation from the Contractor because of the payment by the Contractor of any wage rate in excess of the prevailing rate of per diem wages. The possibility of wage increases is one of the elements to be considered by the Contractor in determining its bid and will not, under any circumstances, be considered as the basis of a claim against the District under this contract.

3. Hours of Labor

a. Pursuant to Sections 1810 through 1815 of the Labor Code, eight hours of labor constitutes a legal day's work, and work performed by employees of the Contractor or any subcontractor in excess of eight hours per day, and forty hours in any one week, shall be compensated at not less than one and one-half times their basic rate of pay. Violation of this condition shall result in a penalty of $25.00 per day per workman so underpaid.

4. Unidentified Utilities – Costs (Government Code 4215)

a. The District shall be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the construction site, if such utilities are not identified in the plans and specifications for the work. The Contractor shall be compensated for his actual costs of locating, repairing damage not due to his failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and specifications with reasonable accuracy and for equipment on the project necessarily idled during such work. If the Contractor discovers utility facilities not identified in the contract plans or specifications, he shall immediately notify the District and the utility in writing. The Contractor shall not be assessed liquidated damages for delay if caused by the failure of the District or the owner of the utility to provide for removal or relocation

of such utility facilities. The District shall provide a layout of all main lines and existing service laterals. The Contractor shall exercise due care in verifying the locations provided by the District and shall notify the District of site conditions that differ from those indicated.

5. Dispute Resolution Procedures for Claims of Less Than $375,000

   a. Sections 20104 - 20104.6 of the Public Contract Code set forth required procedures for the parties to resolve claim disputes involving less than $375,000, including the presentation of written claims with substantiating documents on or before the date of final payment, requests for additional documentation, time limits for responding to written claims, and requiring a conference to meet and confer; and also relating to filing a claim before suit, and required arbitration provisions in the event of a civil action filed to resolve the claim. All of such procedures, time limits and requirements shall be complied with if such Code sections are applicable to disputed claim.

6. Assignment of Antitrust/Unfair Business Practice Claims

   a. Pursuant to Public Contract Code Section 7103, Contractor and any subcontractors supplying goods, services or materials under this contract agree to assign District all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C Sec. 15) or under the Cartwright Act (Chapter 2 commencing with Section 16700 of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to this contract or the subcontract.

7. Substitution of Securities for Retention. Pursuant to Public Contract Code Section 22300 and upon Contractor's request, the District will make payments into escrow of funds which would otherwise be retained from progress payments under the payments to contractor provisions in the Agreement and the Supplementary and General Conditions if the Contractor deposits into that escrow securities eligible for investment under Public Contract Code Section 22300 (hereafter collectively referred to as "securities"), upon the following terms and conditions:

   a. The escrow agent shall be either the District Treasurer or a state or federal chartered bank acceptable to the District.

   b. The Contractor shall bear all expenses of the District and of the escrow agent in connection with the escrow.

   c. The fair market value of the securities shall be at least equal to 100 percent of the cash amount withheld as retention under the contract and the amount of the required securities shall be adjusted from time to time based upon changes in the fair market value of the securities on deposit with the escrow agent. Such securities shall be valued by the District Treasurer whose decision on valuation of the securities shall be final.

   d. The Contractor shall enter into an escrow agreement substantially similar in form to that prescribed in Public Contract Code Section 22300.

   e. The Contractor shall obtain the written consent to the escrow agreement of the surety or sureties furnishing Contractor with its performance and payment bonds.

*SC-7.12 Safety and Protection*

SC-7.12 Add the following new paragraphs after paragraph 7.12.G:

H. In carrying out his/her work, the Contractor shall at all times, exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed, and be in compliance with all federal, state and local statutory and regulatory requirements including California Department of Industrial Relations (Cal/OSHA) regulations; and the U.S. Department of Transportation Omnibus Transportation Employee Testing Act (as applicable). Safety precautions as applicable shall include, but shall not be limited to, adequate life protection, and lifesaving equipment; adequate illumination for underground and night operations; instructions in accident prevention for all employees such as machinery guards, safe walkways, scaffolds, ladders, bridges, gang planks; confined space procedures; trenching and shoring; fall protection; and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents, injuries, or illnesses; and adequate facilities for the proper inspection and maintenance of all safety measures.

I. The Contractor shall be responsible for the safeguarding of all utilities. At least two working days before beginning work, the Contractor shall call the Underground Service Alert (USA) in order to determine the location of sub-structures. The Contractor shall immediately notify the District and the utility owner if he/she disturbs, disconnects, or damages any utility.

J. In accordance with Section 6705 of the California Labor Code, the Contractor shall submit to the District specific plans to show details of provisions for worker protection from caving ground during excavations of trenches of five feet or more in depth. The excavation/trench safety plan shall be submitted to and accepted by the District prior to starting excavation. The trench safety plan shall have details showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such a plan varies from the shoring system standards established by the Construction Safety Orders of the California Department of Industrial Relations (Cal/OSHA), the plan shall be prepared by a California registered civil or structural engineer. As part of the plan, a note shall be included stating that the registered civil or structural engineer certifies that the plan complies with the Cal/OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the plan is not less effective than the shoring, bracing, sloping or other provisions of the Safety Orders. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders. Submission of this plan in no way relieves the Contractor of the requirement to maintain safety in all areas. If excavations or trench work requiring a Cal/OSHA permit are to be undertaken, the Contractor shall submit his/her permit with the excavation/trench work safety plan to the District before work begins.

K. Trench Excavation: Approval of Plan for Protection from Caving

1. If the contract involves an estimated expenditure of more than $25,000, for the excavation of any trench or trenches five feet or more in depth, the Contractor shall submit, for acceptance and approval by the District or its designated engineer, in advance of excavation, a detailed plan showing the design of shoring, bracing,

sloping, or other provision to be made for worker protection from the hazard of caving ground during such excavation, all in accordance with Labor Code Section 6705.

L. Excavations Deeper than Four Feet Involving Hazardous Wastes or Materially Different Site Conditions

1. If the contract involves digging trenches or other excavations that extend deeper than four feet below the surface:

a. The Contractor shall promptly, and before any of the following conditions are disturbed, notify the District, in writing, of any:

(1) Material that the Contractor believes may be material that is hazardous waste as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;

(2) Subsurface or latent physical conditions at the site differing from those indicated;

(3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

b. The District shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work, it shall issue a change order under the procedures described in the Agreement.

c. In the event that a dispute arises between the District and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Agreement, but shall proceed with all work to be performed under the Agreement. The Contractor shall retain any and all rights provided either by contract or by law, which pertains to the resolution of disputes and protests between the contracting parties.

*SC-7.16 Shop Drawings, Samples and Other Submittals*

SC-7.16.E Delete Paragraph 7.16.E.2 in its entirely and insert the following in its place:

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than two submittals. Engineer will record Engineer's time for reviewing a third or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

*SC-7.18 Indemnification*

SC-7.18.A Delete paragraph 7.18.A in its entirety and insert the following in its place:

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work or the failure, neglect or refusal of the Contractor to perform the Work and all obligations under the Contract, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

**ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

*SC-11.01 Amending and Supplementing Contract Documents*

SC-11.01 Insert the following subparagraphs immediately following 11.01.A.1.b.

c. In signing a Change Order, the Owner and Contractor acknowledge and agree that:

1) the stipulated compensation (Contract Price or Contract Times, or both) set forth in the Change Order includes not only all direct costs of Contractor such as labor, material, job overhead, and profit markup, but also includes any costs for modifications or changes in sequence of work to be performed, delays, rescheduling, disruptions, extended direct overhead or general overhead, acceleration, material or other escalation which includes wages and other impact costs. This document will become a supplement to the Contract and all Contract provisions will apply hereto. It is understood that this Change Order shall be effective on the date approved by the Owner's Representative.

2) the Change Order constitutes full mutual accord and satisfaction for the change to the Work;

3) no reservation of rights to pursue subsequent claims on the Change Order will be made by either party; and

4) no subsequent claim or amendment of the Contract Documents will arise out of or as a result of the Change Order.

*SC-11.05 Change of Contract Times*

SC-11.05 Add the following new paragraphs immediately after 11.05.B:

C. Use of Float:

1. A request for adjustment of Contract Times (or Milestones), otherwise

allowable under the Contract Documents, shall be granted only when the time lost or gained exceeds the float for the activity at the time of the event giving rise to the claim. Float, the amount of time between the early start date and the late start date, or the early finish date and the late finish date, is jointly owned by both Owner and Contractor whether expressly disclosed or implied in any manner.

2. Contractor shall not use float suppression techniques (including, but not limited to, preferential sequencing caused by late starts of follow-up trades, unreasonably small crews, extended durations, or imposed dates) in information provided to Engineer.

D. Weather Days:

1. The Contract Time includes a weather day allowance of 20 working days. No extension in Contract Time will be allowed for the first 20 working days lost due to weather conditions.

**ARTICLE ARTICLE 12 - CLAIMS**

*SC-12.01 Claims*

SC-12.01 Delete Paragraph 12.01 in its entirely and insert the following in its place:

SC-12.01 Claims:

A. Claims between the Owner and Contractor shall be addressed as provided by California Public Contract Code Section 9204, which is set forth in its entirety:

9204. Legislative findings and declarations regarding timely and complete payment of contractors for public works projects; claims process

(a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:

(1) "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

(C) Payment of an amount that is disputed by the public entity.

(2) "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

*(3) Public entity definition*

(A)"Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

(B) "Public entity" shall not include the following:

(i) The Department of Water Resources as to any project under the jurisdiction of that department.

(ii) The Department of Transportation as to any project under the jurisdiction of that department.

(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.

(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.

(v) The Military Department as to any project under the jurisdiction of that department.

(vi) The Department of General Services as to all other projects.

(vii) The High-Speed Rail Authority.

(4) "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

(5) "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

*(d) Claims Process*

*(1) Claims review and response*

(A) Upon receipt of a claim pursuant to this Section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.

(B) The claimant shall furnish reasonable documentation to support the claim.

(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to 3 days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

(D) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

*(2) Claims dispute*

(A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this Section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed

portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this Section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.

(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on their own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2027, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2027, deletes or extends that date.

*End of PCC Section 9204*

B. Claims Process Additional Requirements:

1. Claims asserted by the Owner against the Contractor shall be submitted according to the procedures set forth above.

2. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled. Such a claim shall be submitted promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal.

3. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

C. Mediation:

1. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision.

D. Claims of $375,000 or less shall be resolved in accordance with California Public Contract Code Section 20104 et seq. unless Owner elects to resolve the dispute in accordance with California Public Contract Code Section 10240 et seq.

**ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

*SC-13.02 Allowances*

SC 13.02 Add the following new subparagraph immediately paragraph 13.02.D:

E. *Reimbursement Allowance*: Contractor agrees that a reimbursement allowance, if any, is for reimbursement of the actual cost or fee for which it is designated (typically permits), without additional markup for overhead, profit or handling. If the Owner includes a reimbursement allowance in the Bid Form, the Owner will establish its value.

*SC-13.03 Unit Price Work*

SC 13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the extended price of a particular item of Unit Price Work amounts to 25 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 10 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

**ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

*SC-15.01 Progress Payments*

15.01.C Delete Paragraph 15.01.C.1 in its entirety and insert the following in its place:

1. Engineer will, within 7 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

15.01.D Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

1. Thirty calendar days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

*SC-15.03 Substantial Completion*

SC 15.03.A Add the following subparagraphs immediately after Paragraph 15.03.A:

1. To be considered substantially complete, all Work must be operational and ready for Owner's continuous use as intended.

2. Portions of the Work not essential to operation, which can be completed without interruption operation, may be completed after the Work is accepted as Substantially Complete, and may include the following items:

    a. Final O&M manuals.
    b. Spare parts.
    c. As-built documents.
    d. Final clean-up.

SC 15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

**ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

*SC-17.01 Methods and Procedures*

SC-17.01 Add the following subparagraphs immediately after Paragraph 17.01.B.3:

4. Resolve claims of $375,000 or less pursuant to California Public Contract Code Section 20104 et seq., unless Owner elects to resolve the dispute pursuant to California Public Contract Code Section 10240 et seq.

*SC-17.02 Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 Arbitration

A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of JAMS Endispute Streamlined Arbitration Rules and Procedures, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.

C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

**ARTICLE 18 – MISCELLANEOUS**

*SC-18.06 Survival of Obligations*

SC-18.06 Delete paragraph 18.06.A in its entirety and replace it with the following:

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations in accordance with California Commercial Code, Section 1101 et seq., and as indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

*SC-18.07 Controlling Law*

SC-18.07 Delete paragraph 18.07.A in its entirety and replace it with the following:

A. This Contract shall be construed and enforced according to the laws of the State of California, and the parties hereby agree that the County of Monterey shall be the proper venue for any dispute arising hereunder.

# MARINA COAST WATER DISTRICT

## CIP GW-2404GN

## RESERVATION ROAD DESALINATION PLANT RENOVATION PROJECT

### TECHNICAL SPECIFICATIONS

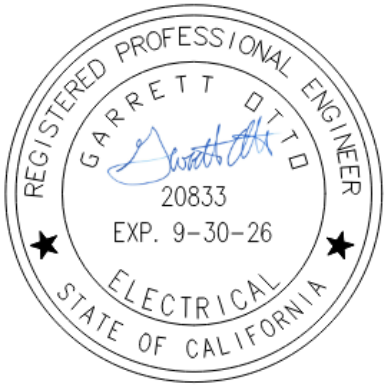
**MARINA COAST WATER DISTRICT (MCWD)**

**CIP GW-2404GN**
**RESERVATION ROAD DESAL PLANT RENOVATION PROJECT**

These technical specifications were prepared by professional(s) qualified in their respective disciplines. The following professional(s) were responsible for preparing these technical specifications, and their initials are indicated by each specification section as being the responsible engineer of record (EOR) for corresponding sections prepared by each respective EOR. If only one professional engineer is listed below, he/she will serve as the EOR for the entirety of these Technical Specifications. The professional seal(s) on these technical specifications correspond to each individual listed and the respective specification sections each is responsible for:

- Zachary C. Markow, P.E. (ZCM), Wallace Group, License C92952
- Garrett Otto, P.E. (GO), Otto Electrical, Inc., License E20833




**TECHNICAL SPECIFICATIONS GROUP**

**GENERAL REQUIREMENTS SUBGROUP**
**Division 01 – General Requirements (in conjunction with SSCWD Standards)**


| | | |
|---|---|---|
| 01 11 00 | Summary of Work | ZCM |
| 01 20 00 | Price and Payment Procedures | ZCM |
| 01 30 00 | Administrative Requirements | ZCM |
| 01 32 16 | Construction Progress Schedule | ZCM |
| 01 33 00 | Submittal Procedures | ZCM |
| 01 35 00 | Special Project Procedures | ZCM |
| 01 50 00 | Temporary Facilities and Controls | ZCM |
| 01 57 13 | Temporary Erosion and Sediment Control | ZCM |
| 01 57 23 | Temporary Storm Water Pollution Control | ZCM |
| 01 70 00 | Execution and Closeout Procedures | ZCM |


**FACILITY CONSTRUCTION SUBGROUP**
**Division 02 – Existing Conditions**


| | | |
|---|---|---|
| 02 21 00 | Surveying | ZCM |
| 02 42 00 | Removal and Storage of Construction Materials | ZCM |

**Division 03 – Concrete**
03 30 00 Cast-in-Place Concrete .....ZCM

**Division 04** – Not Used

**Division 05 – Metals**
05 05 19 Post-Installed Concrete Anchors .....ZCM

**Divisions 06 to 07** – Not Used

**Division 08 – Openings**
08 31 13 Access Doors and Frames .....ZCM

**Division 09 – Finishes**
09 90 00 Painting and Coating .....ZCM

**Divisions 10 to 13** – Not Used

**FACILITY SERVICES SUBGROUP**
**Divisions 21 to 25** – Not Used

**Division 26 – Electrical**
26 05 05 Selective Demolition for Electrical .....GO
26 05 19 Low-Voltage Electrical Power Conductors and Cables .....GO
26 05 29 Hangers and Supports for Electrical Systems .....GO
26 05 33.13 Conduit for Electrical Systems .....GO
26 24 13 Switchboards .....GO
26 29 13 Enclosed Controllers .....GO

**Divisions 27 to 28** – Not Used

**SITE AND INFRASTRUCTURE SUBGROUP**
**Division 31 – Earthwork**
31 00 01 Earthwork Special Provisions .....ZCM

**Division 32 – Exterior Improvements**
32 11 23 Base Courses .....ZCM
32 12 00 Flexible Paving .....ZCM
32 17 23 Pavement Markings .....ZCM

**Division 33 – Utilities**
33 01 10.53 Flushing of Water Utility Piping .....ZCM
33 01 10.58 Disinfection of Water Utility Piping Systems .....ZCM
33 01 10.91 Rehabilitation of Water Supply Wells .....ZCM
33 05 23 Stainless Steel Utility Pipe and Tubing .....ZCM
33 05 31 Polyvinyl Chloride Pressure Pipe .....ZCM
33 05 33 Polyethylene Utility Pipe .....ZCM
33 16 01 Double Ball Expansion Joint .....ZCM
33 39 14 Polymer Concrete Manholes .....ZCM

**Divisions 34 and 35** – Not Used

**PROCESS EQUIPMENT SUBGROUP**
**Division 40 – Process Interconnections**
40 05 00 Common Work Results for Process Interconnections .....ZCM
40 05 65.23 Swing Check Valves .....ZCM
40 71 13 Magnetic Flow Meters .....ZCM
40 73 26 Gauge Pressure Transmitters .....ZCM

**Divisions 41 through 42 –** Not Used

**Division 43 – Process Gas and Liquid Handling, Purification, and Storage Equipment**
43 25 00 Submersible Vertical Turbine Pumps .....ZCM

**SECTION 01 11 00**

**SUMMARY OF WORK**

## PART 1 GENERAL

1.1 WORK INCLUDED

A. The Work includes construction of replacement raw water supply and brine discharge facilities, as well as replacement electrical equipment for the Marina Coast Water District (MCWD, District, or Owner) Reservation Road Desalination Plant (Plant), located at 11 Reservation Road, Marina, CA 93933. This work will require coordination with MCWD, the California Department of Parks and Recreation (State Parks), and the City of Marina (City). A summary of the Work is as follows:

1. Installation of Replacement Intake Well Pump, Piping, and Vault:
    a. Intake well pump shall be furnished by the District and installed in existing Intake Well by Contractor.
    b. Furnish and install replacement intake well vault, including all necessary earthwork and pre-cast vault base.
        1) All earthwork shall comply with Specification Section 31 00 00.
    c. Furnish and install replacement Schedule 80 PVC well discharge piping, including all fittings and appurtenances, as shown in the Plans and in compliance with the District Standard Specifications and these Technical Specifications.
2. Pipe Inspection and Testing:
    a. Inspection and pressure testing of existing intake supply and brine discharge piping.
3. Replacement Intake Well and Brine Discharge Piping:
    a. Furnish and install approximately 200 LF of 6” DR 13.5 HDPE pipe from the intake well piping to the connection with the existing 12” C900 PVC supply line, as shown in the Plans.
    b. Installation of approximately 15 LF of 6”AP Schedule 80 PVC at the existing Desalination Plant building.
    c. Installation of approximately 150 LF of 8” Schedule 80 PVC pipe from the existing brine discharge line to the existing discharge well, including all fittings, valves, appurtenances, and wellhead connection, as well as the location and condition assessment of existing brine discharge pipeline.
4. Replacement Electrical Systems:
    a. Removal of existing switchgear and installation of Owner-furnished replacement switchgear, including coordination with Owner for delivery of replacement switchgear to the Project Site.
    b. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances required to connect replacement intake well pump to replacement switchgear as shown in the Plans.
    c. All conduit, condulets, pull boxes, cabling, pull wire, and associated appurtenances as shown in the Plans, for the intake and discharge well level transducers, flow meter, pressure transducers, and pressure switch.

d. Furnish and install level transducers in the rehabilitated intake and injection wells, as shown in the Plans.

B. Bid Alternates: As identified in the Bid Schedule, bid alternate items include:
1. Full Replacement of Intake Supply Line:
a. Abandon existing 12" C900 PVC intake well supply line and replace with 12" DR 13.5 HDPE water main in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 450 LF of 12" DR 13.5 HDPE pipe. This includes the utility location and potholing at all crossings.
2. Full Replacement of Brine Discharge Line:
a. Remove and replace existing 8" brine discharge line with 8" Schedule 80 PVC pipe in the alternative alignment shown in the Plans. Alternative alignment results in the installation of approximately 225 LF of 8" Schedule 80 PVC pipe. This includes the utility location and potholing at all crossings.
3. Well Rehabilitation:
a. Rehabilitation of three (3) existing groundwater monitoring wells located on the Owner's existing desalination plant property. Refer to Specification 33 01 10.91
b. Intake Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents, including the construction and maintenance of a temporary, unpaved access road to the existing intake well located on Marina State Beach property. Refer to Specification 33 01 10.91.
c. Discharge Well Rehabilitation in compliance with the Well Rehabilitation Plan incorporated into these Contract Documents. Refer to Specification 33 01 10.91.

C. The Work consists of items listed in the Base Bid Schedule. Refer to Section 01 20 00 for further definition.

D. All Work in this Contract shall be subject to the Contract Documents, applicable requirements of encroachment permits from the City of Marina, right-of-entry form State Parks, and environmental permitting requirements.
1. Contractor shall prepare and implement a Traffic Control Plan (TCP) as required by the City of Marina.

E. Project Coordination and Considerations:
1. Cooperate with Marina Coast Water District, State Parks, and the City of Marina staff, contractors, and sub-contractors, and all other agencies requiring such coordination/cooperation throughout the construction of the Work, including coordination of lay down and construction staging areas.
2. Complete all work required by Section 01 57 13 Temporary Erosion and Sediment Control and Section 01 57 23 Temporary Storm Water Pollution Control of these specifications.
3. Furnish, install, and maintain all ESA fencing as shown in the Plans and in compliance with the requirements of Section 01 50 00.

4. Establish a construction schedule and sequence of events in compliance with the provisions of Paragraph 1.9, this Section.
5. Complete all other legal and environmental requirements applicable to the Contractor's operations and construction work for the project.

1.2 SUBMITTALS

A. In accordance with Section 01 33 00 – Submittal Procedures, submit the following:
1. Construction Work Plan. Submit a detailed Construction Work Plan for review and approval by Owner and Engineer. Plan shall be of sufficient detail to adequately describe the elements of Work, timing and sequencing of tasks and subtasks and coordinated with Project Schedule (per Section 01 30 00); in particular, plan shall identify:
   a. Equipment, materials, and procedures for pressure testing and inspection of existing supply and discharge pipes,
   b. Pipeline flushing plan, including management of flush water, in compliance with Section 33 01 10.53,
   c. demolition, removal, and salvage procedures,
   d. management and disposal of well test water and all sediment and debris removed from the wells during rehabilitation efforts,
   e. coordination with all agencies,
   f. temporary erosion control and sediment control BMPs,
   g. staging/laydown areas and coordination thereof,
   h. and all other aspects of the Work.
2. Submit Construction Work Plan at the pre-construction meeting, or within 14 days following Notice to Proceed, whichever occurs first.
   a. Physical Work on the Project site shall not commence until such time this Work Plan is approved (except for pressure testing and disinfection plan which may be submitted a minimum of 14 days prior to such Work).
3. Pressure Testing and Disinfection Plan. Prior to performing any testing on installed water mains, the Contractor shall provide a detailed pressure testing, flushing, and disinfection plan clearly identifying the necessary equipment, materials, and procedures utilized to meet the requirements of District Standards and these Specifications. Refer to Section 33 01 10.53 – Flushing of Water Utility Piping, Section 33 01 10.58 - Disinfecting of Water Utility Piping, and MCWD Standard Specification 15042, Hydrostatic Testing of Pressure Pipelines. Contractor shall provide the Engineer and/or Owner at least 14 days to review and approve the submitted plans prior to the commencement of the work.
4. Well Access Plan. Prior to performing any work on the existing intake well, the Contractor shall provide a detailed Well Access Plan, identifying the necessary equipment, materials, and procedures utilized to access the intake well site. This plan shall include, but is not limited to, the items identified in Paragraph 1.03.A.2 of Specification 31 00 01, Earthwork Special Provisions.
5. Tie-In Plans. For each connection to existing pipelines, Contractor shall provide a detailed Tie-In Plan in accordance with Paragraph 1.9.B.7 herein.
6. Cutover Plan. Contractor shall provide to Owner, for review and approval, a cutover plan outlining the equipment, materials, and procedures followed for replacement of the existing switchgear with the replacement switchgear

furnished by the Owner. Information included in the Cutover Plan shall include, but is not limited to, the following:

a. Scheduled duration for the cutover
b. Coordination efforts between Contractor and PG&E for all de-energizing, energizing, and inspections, and when these events will take place during the cutover.

7. Traffic Control Plans. Submit the Traffic Control Plans at the pre-construction meeting, or within 21 days following receipt of Notice to Proceed, whichever occurs first.

1.3 WORK NOT INCLUDED

A. Except for such auxiliary work as is shown or specified or is necessary as a part of the construction, the following work is NOT included in this Contract.

1. Work shown but marked "NIC" (Not in Contract), or otherwise designated to be performed by others.
2. Procurement of items marked “OFCI” (Owner Furnished, Contractor Installed). Note that this does not relieve the Contractor of the requirements to install any OFCI items, and to perform the work as shown in the Plans and in compliance with these Specifications.

1.4 LOCATION OF PROJECT SITE

A. The Project is composed of existing infrastructure owned by Marina Coast Water District at their existing Reservation Road Desalination Plant, located at 11 Reservation Road, in Monterey County, in the incorporated area east of the City of Marina, as well as their existing intake supply well, which is located within easements granted to the District on property owner and operated by State Parks. Contractor’s attention is directed to the Project and Vicinity Maps provided in the Plans.

1.5 SPECIFICATIONS

A. The Specifications are those bound in the Project Manual and otherwise incorporated by reference. All sections of the Project Manual, including Notice Inviting Bids and Instructions to Bidders, are part of the Contract Documents for this Work. The Project Manual consists of the Notice Inviting Bids, Instructions to Bidders, General Conditions of the Contract for Construction, Supplementary Conditions of the Contract for Construction, including Division 01 through 43 of these Technical Specifications, MCWD Standard Specifications, and Caltrans 2025 Standard Specifications, where referenced.

1.6 SPECIAL PROVISIONS

A. Throughout these technical specifications, Division 01 through Division 43, where conflict exists between the Supplementary Conditions and these Technical Specifications, the requirements of the Supplementary Conditions shall prevail.

1.7 DRAWINGS

A. The Drawings consist of 18 sheets prepared by Wallace Group, dated November 19, 2025.

1.8 INTERRUPTION OF SERVICES

A. Contractor shall identify all planned interruptions of water service and system shutdowns in the Construction Work Plan and in all construction schedules.

B. Timing of any service disruption(s) shall be approved by Owner, and such Work shall be scheduled during dry periods with no rainfall in the forecast for the duration of the Work.

C. Contractor shall provide door tags or similar notices to residents impacted by any interruptions of services. Contractor shall coordinate with MCWD, if necessary, to define the language and contact information provided on the notices.

D. Interruptions to water service, if necessary, shall be limited to no more than 8 hours in duration, and service shall be restored to all affected residents prior to the end of the work day.

1.9 COORDINATION OF THE WORK/SEQUENCING OF WORK

A. Permits:
   1. City of Marina will require an encroachment permit for the rehabilitation of the desalination plant pipelines and conduits within the paved City right of way (Reservation Road). Contractor shall be responsible for securing this permit, including any permit fees, at no additional cost to Owner.
   2. Owner is obtaining right-of-entry from State Parks to provide access to the existing facilities located on the Marina State Beach property.

B. General Scheduling Requirements
   1. Contractor shall, as the preliminary work item, perform pressure testing on the existing intake supply and brine discharge piping. Contractor shall document the test results and submit to the Owner and Engineer for review and approval.
      a. If one of both portions of the existing piping fail the pressure test and leaking is detected, the Owner may direct to execute one of both alternative bid items summarized in Paragraph 1.1.B above.
      b. Contractor shall submit the pressure testing plan outlined in Paragraph 1.2.A for review and approval by Owner prior to commencement of pressure testing work.
   2. Well Rehabilitation: Contractor shall follow the task order identified in the Well Rehabilitation Plan in Specification Section 33 01 10.91. Any Contractor proposed variations to this task order shall be submitted to the Owner for review and approval.
   3. Discharge Well Renovations: All rehabilitation tasks for the existing discharge well, as identified in the Well Rehabilitation Plan in Specification Section 33 01 10.91, shall be performed prior to installation of replacement discharge wellhead piping.

4. Intake Well Renovations: All rehabilitation tasks for the existing intake well, as identified in the Well Rehabilitation Plan in Specification Section 33 01 10.91, shall be performed prior to installation of replacement intake well, vault, and piping.
5. Prior to installation of replacement pipelines and electrical and communication conduits, Contractor shall pothole all utilities and submit the resulting Potholing Report to Owner and Engineer, in compliance with Section 01 35 00, Special Project Procedures.
6. Contractor shall coordinate with MCWD and State Parks at least 7 days prior to accessing the existing intake well and MCWD facilities located on State Parks property.
7. For each connection to existing process water pipes, provide detailed tie-in and cut-over plans as required, detailing timing, equipment and requirements to tie into the existing MCWD water piping.
    a. Submit tie-in plan and method statement, a minimum of 14 days prior to commencing work.
    b. Contractor shall coordinate tie-in with Owner-designated representative a minimum of 14 days in advance of work.
8. Include and address the requirements of subsection 1.1.D. above in Contractor's Work Plan for review and approval by MCWD and Engineer.

C. At least 14 days prior to the commencement of Work, Contractor shall verify and confirm, to the Owner's Representative in writing, the existing grades, elevations, and conditions of the Project Site. Any discrepancies between existing conditions and the contract documents must be brought to the Owner's attention during that time frame.

D. At least 14 days prior to the commencement of Work, Contractor shall perform potholing of all underground utilities within the Project Site. Any discrepancies between existing conditions and the contract documents must be brought to the Owner's attention during that time frame. Refer to Section 01 35 00 for additional potholing requirements.

E. For the duration of the intake well and discharge well rehabilitation efforts, Contractor shall securely install a temporary wellhead cover on both the intake and discharge wells at the end of each working day. Temporary wellhead cover shall be fastened to the wellhead by anchor bolts, as shown in the Plans.

F. Prepare schedules as set forth in Section 01 30 00, Administrative Requirements.

1.10 HOURS OF WORK

A. Perform Work of this Contract on normal workdays and within normal work hours; 7:00 am to 5:00 pm Monday through Friday. After hours work and work on Saturdays, Sundays, and Owner holidays, may be permitted if approval is received from the Owner and from State Parks and/or the City of Marina at least 3 working days in advance, at no additional cost to Owner. When Contractor schedules Work on non-working days or after-hours work, the Contractor shall be responsible for the overtime costs incurred by the Owner for inspections and other related activities, unless such schedule was requested by Owner or Engineer.

B. Continuously keep existing drainage facilities, walks, and paved areas clean and free of mud and dirt, obstacles, etc., and protect against damage.

C. Closeout Timetable. Coordinate with Owner to establish dates for equipment, testing, acceptance periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the Owner and their authorized representatives sufficient time to schedule attendance at such activities.

D. Final Submittals: Prior to requesting final payment, obtain and submit the following items to the Engineer for transmittal to the Owner:
   1. Written guarantees, where required.
   2. Operating manuals and instructions, where required.
   3. Completed record drawings per Section 01 70 00.
   4. Certificates of inspection and acceptance by local governing agencies having jurisdiction, including but not limited to, MCWD, State Parks and the City of Marina.
   5. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.11 TRAFFIC CONTROL

A. Prepare traffic control plans to address traffic control, work along, and ingress/egress to and from each of the project locations as described in Paragraph 1.4.A in accordance with the latest edition of the CA MUTCD, for approval by the City of Marina. Coordinate traffic control requirements with the Designated Representative, City of Marina.

B. Traffic control shall be permitted Monday through Friday, from 7am to 5pm. Contractor shall file with the County a separate Traffic Control Plan for any weekend or night work, if approved by the Owner.

C. One full lane of traffic, regulated by flaggers, shall be left open for traffic at all times.

D. Portable changeable message signs (PCMS) are not required for this Project.

1.12 SITE ACCESS

A. All Work, except for all work associated with the Intake Well and Intake Well Piping is in either the City right-of-way, permanent easements owned by MCWD, temporary construction easements, or right-of-entries granted from State Parks, and access shall be subject to requirements specified in these technical specifications.

B. Coordination with State Parks is required for the work associated with the existing intake well. All requests for access to State Park property shall be made at least 7 days in advance of the planned work.

1.13 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. Refer to Article 5 of the EJCDC General Conditions and other Division 01 Sections for Contractor responsibilities. Where conflicts between the General Conditions and these Technical Specifications occur, the provisions of these Technical Specifications shall prevail.

B. Damage to existing improvements caused by Contractor's operations, either on-site or on adjacent sites, shall be repaired to their original condition as approved by the County Engineer and the owner of the damaged property. Cost of such repair shall be borne entirely by Contractor.

C. Drawings indicate existing structures, drainage lines, water, gas, electrical and other similar items and utilities that are known to the Owner. Locate known existing structures and utilities before proceeding with construction. Maintain them in service, except as otherwise specified. Provide protection and repair damage to them caused by the Work at no increase in Contract price.

D. A geotechnical investigation was performed for the proposed work. This report will be provided to the Contractor for reference. This report may be used for the following purposes:
   1. In regard to the soils and road section conditions to be encountered in and around the project area, the data contained in the report may be used for information only as to the soil and pavement section conditions encountered at the location/address shown and on the date stated. The Contractor is solely responsible for satisfying itself as to the kind and type of soil, and characteristics of road sections to be encountered in the alignment of the work, and any water or other subsurface conditions which might affect the construction of the project.
   2. Only where specifically called out in these specifications, the report may be used for design parameters in the preparation of shop drawings for the Project.
   3. Conclusions and recommendations contained in the report, which are not specifically referenced in these specifications, are not a part of the Contract.

**END OF SECTION**

## SECTION 01 20 00

## PRICE AND PAYMENT PROCEDURES

### PART 1 GENERAL

1.01 This Section describes the methods of measurement and payment for the specific bid items. All other provisions of the Contract Documents which relate to measurement and payment are applicable, except that where conflicts occur between this section and other provisions of the technical specifications or reference specifications, this measurement and payment section shall prevail.

### PART 2 PRODUCTS

Not Used.

### PART 3 EXECUTION

3.01 GENERAL

A. All work shown, described, or otherwise required by the Contract Documents, shall be included within the given bid items.

B. Payment for all bid items shall include full compensation for all equipment, materials, labor, tools, trucking, and all other incidental work necessary to construct complete and operational systems which conform to the Contract Documents.

3.02 MEASUREMENT AND PAYMENT FOR BID ITEMS

A. All lengths shall be measured in a horizontal plane (plan view dimensions), unless otherwise specified. All areas measured shall be based on the specified measurement definition included in each bid item description.

B. All work shown, described, or otherwise required by the Contract Documents, shall be included within the given bid items.

C. Basis for the submitted bid shall be on the quantities shown for the items on the Bid Sheet.

D. Unit definitions of Measurement and Payment

1. “Lump Sum”, or “LS”, shall mean a single Lump Sum Payment for the identified bid item. Partial payments may be made, based on the Engineer’s estimate of the percent completion of the specified item. Provide schedule of values for lump sum bid items in accordance with Para 3.03 of this Section.

2. "Each", or "EA", shall mean the actual number of identified bid items provided. Payment for the identified bid item will be based on providing each item, complete and in place in accordance with the contract documents.

3. Measurable units of quantity expressed in "Linear Feet" or "LF"; "Cubic Yard or CY"; "Ton"; "SF" or "SY" shall mean the number of indicated measurable quantities of the bid item. Payment for the identified bid item will be based on actual and measured quantities of the bid item complete and in place in accordance with the contract documents.

4. For extra work, and quantity changes for unit price work, refer to the General Conditions.

E. Final Pay Quantities.

1. The quantity shown on the bid sheet for a Final Pay Quantity shall be the final pay quantity used for the purpose of payments, unless the dimensions of any portion of the item are modified by the Engineer, or the item or any portion of the item is eliminated.

2. If the dimensions of any portion of a Final Pay Quantity bid item are changed, and the changes result in an increase or decrease in the quantity of the item, the final pay quantity will be revised by the change in quantity.

3. If a portion of a Final Pay Quantity item, or the item is eliminated, the final pay quantity will be adjusted by the quantity eliminated.

4. The estimated quantity shown on the bid sheet for a Final Pay Quantity bid item shall be considered as an estimate only and no guarantee is made that a quantity computed based on the details and the Plans, will equal the estimated quantity shown on the bid sheet. No allowance is made in the event that a computed quantity does not equal the estimate quantity.

5. In the case of a discrepancy between a quantity shown on the plans, and an estimated quantity shown on the bid sheet for a Final Pay Quantity item, payment will be based on the quantity shown on the bid sheet.

3.03 SCHEDULE OF VALUES

A. The Contractor shall submit to the Owner for acceptance, in the form directed by or acceptable to the Owner, a complete schedule of the values for each item in the bid schedule, breaking down the various portions of the Work, including quantities and unit prices, aggregating the Contract Price (except in cases and to the extent that accepted unit prices form the basis for payment).

B. The schedule shall subdivide the items of Work into component parts in sufficient detail to serve as the basis for progress payments during construction and to coordinate with the progress schedule required for this Work, and shall be supported by such data to substantiate its correctness as the Owner may require.

C. Each item in the schedule of values shall include its proper share of overhead and profit. An unbalanced breakdown providing for overpayment to the Contractor on items of Work which would be performed first will not be approved.

D. The schedule of values, when accepted by the Owner, shall be used only as a basis for the Contractor's applications for payment and not for additions to, or deductions from, the Contract Price. The initial submittal for the schedule of values shall be provided at the preconstruction conference or within 10 days following the Notice to Proceed, whichever comes sooner.

# BASE BID

**Bid Item No. 1 – Mobilization/Demobilization**

A. Units: Lump Sum

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Mobilization/Demobilization.

1. Partial payment for Mobilization/Demobilization work will not be made until listed items in the schedule of values have been completed to the satisfaction of the Owner.
2. Mobilization/Demobilization shall not be more than 5% of the overall contract price.
3. Contractor shall be compensated no more than 70% of total bid value for Mobilization/Demobilization for mobilization; and 30% for mobilization/demobilization for demobilization following completion of Work.

D. Scope of bid item: Mobilization/Demobilization includes, but is not limited to the following:

1. Mobilization/demobilization.
2. Obtaining all required bonds, insurance, and permits.
3. Compliance with State Parks encroachment permit requirements, City of Marina encroachment permit requirements, and other agency permit requirements for the Work.
4. Posting all Cal-OSHA required notices and establishment of safety programs and injury and illness prevention plan (IIPP).
5. Maintaining project schedule.
6. Preparation of work plans required to complete all work.
7. All Contractor's facilities and equipment required for project operations.
8. Arranging for and erection of Contractor's work areas and storage yards and coordinating such work areas and storage yards with Marina Coast Water District staff, State Parks, the City of Marina, and other agencies as necessary.
9. Coordination with utility companies during construction activities adjacent to utility agency facilities.

10. Potholing utilities and providing pothole reports.
11. Coordinating with Marina Coast Water District, State Parks, the City of Marina, and other agencies during construction.
12. Providing and installing temporary communication facilities.
13. Providing and installing construction water and on-site sanitary facilities.
14. Providing temporary wellhead covers.
15. Designation of the Contractor's superintendent(s) who will be present at the job site full time.
16. Documenting construction progress, including pre- and post-construction photographs and videos, and progress photographs.
17. Preparing and submitting field record drawings, close-out submittals, including all locations of potholed utilities.
18. Removing equipment, personnel, temporary facilities, and other construction resources at job completion.
19. Site cleanup.
20. All other incidental work as specified in Division 01 of these Specifications, Project Supplementary Conditions, District Standard Specifications, referenced Caltrans standard specifications, permit requirements, and as necessary to complete Mobilization/Demobilization in accordance with the Contract Documents.

**Bid Item No. 2 - Construction Survey**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Construction Survey.

D. Scope of bid item: Construction Survey includes, but is not limited to the following:

1. Establishing horizontal control based on survey information provided in the Plans.
2. All survey Work related to existing and proposed water main works, as described in Section 02 21 00 – Surveys and the Drawings.
3. Re-setting monuments that may be damaged or need to be removed as part of the Work.
4. Replacement of property corner markers, including proper recordation.
5. All other incidental work necessary to complete Construction Survey in accordance with the Contract Documents.

**Bid Item No. 3 – Erosion, Sediment, and Water Pollution Control**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Erosion, Sediment, and Water Pollution Control.

D. Scope of bid item: Work for Erosion, Sediment, and Water Pollution Control includes, but is not limited to the following:

1. Proper management of storm water, dust, sediment, and erosion with best practices, where required, including pr. Refer to Section 01 57 13 – Temporary Erosion and Sediment Control and 01 57 23 Temporary Storm Water Pollution Control.
2. Complying with all reporting, monitoring, inspection and permitting requirements for protection of water quality.
3. All labor, equipment and materials to perform Erosion, Sediment, and Water Pollution Control activities.
4. All other incidental work necessary to complete Erosion, Sediment, and Water Pollution Control in accordance with the Contract Documents.

**Bid Item No. 4 – Traffic Control**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Traffic Control.

D. Scope of bid item: Work for Traffic Control includes, but is not limited to the following:

1. Traffic control in accordance with City of Marina requirements, and as required for execution of the Work.
2. Required plans and submittals.
3. All other incidental work necessary to complete Traffic Control in accordance with the Contract Documents.

**Bid Item No. 5 - Sheeting, Shoring and Bracing**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Sheeting, Shoring and Bracing.

D. Scope of bid item: Work for Sheeting, Shoring and Bracing includes, but is not limited to the following:

1. Required fees, permits, plans, and submittals, prepared by California registered civil or structural engineer.
2. Compliance with all requirements for Cal-OSHA construction safety in the excavation of trenches and pits, and other technical requirements in Division 31 specifications, and trench details on the plans.
3. Trench excavation plans, as required.
4. Providing adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which shall conform to the applicable construction safety orders.
5. All other incidental work necessary to complete Sheeting, Shoring and Bracing in accordance with the Contract Documents.

**Bid Item No. 6 – Intake Well Access Road and Pad Grading**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Intake Well Access Road and Pad Grading.

D. Scope of bid item: Work for Intake Well Access Road and Pad Grading includes, but is not limited to, the following.

1. Rough and finish grading of as shown in the Plans and in compliance with these Specifications.
2. Furnish and install temporary matting, as shown in Plans, for access road stabilization and as necessary to allow access to the existing intake well.
3. Control/management of groundwaters, where required.
4. Verification of adjacent utilities and potholing of potential conflicting utilities.
5. Protection of existing utilities.
6. All clearing and grubbing work defined in Specification 31 00 00, Section 3.02, including disposal of removed objectionable material.
7. All other incidental work necessary to complete Intake Well Access Road and Pad Grading in accordance with the Contract Documents.

**Bid Item No. 7 – Intake Well Pump, Vault, and Piping**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Intake Well Pump, Vault, and Piping.

D. Scope of bid item: Work for Intake Well Pump, Vault, and Piping includes, but is not limited to, the following.

1. Complete installation of OFCI stainless steel well pump, including the procurement and installation of pump discharge elbow, piping, valves, fittings, and appurtenances.
2. Provide fittings and fasteners required to make connection to 6" HDPE intake well piping.
3. Furnish and install precast polymer concrete vault structure, including base, riser, lid, access hatch, and penetration seals.
4. All earthwork required for placement of vault and piping, including all sub-grade preparation, excavation, scarification, backfill, and compaction, including removal, hauling, and disposal of all debris and deleterious materials.
5. Furnish and install pressure-treated lumber barricade, including all fasteners and Class B concrete footings.
6. Patching and rehabilitation of concrete wellhead structure and anchors.
7. All other incidental work necessary to complete Intake Well Rehabilitation in accordance with the Contract Documents.

**Bid Item No. 8 – Site Electrical Renovations**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Site Electrical Renovations.

D. Scope of bid item: Work for Site Electrical Renovations includes, but is not limited to, the following.

1. Furnish and install all above-ground and underground conduit, including all fittings and conduit supports/hangers and pull rope, where shown on the Drawings.
2. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required, including providing and placing cement slurry backfill.
3. Install owner-furnished replacement switchgear.
4. Furnish and supply all paneling, cabinets, disconnects, and electrical equipment associated with the Owner-furnished replacement switchgear, as shown in the Plans.
5. Furnish, install, and land all cabling and conductors, including nylon string for pulling/fishing conductors through installed conduit runs as shown in the Plans.
6. Furnish and install all flow meter(s), pressure and level transducers, and pressure switch(es) in the quantity and location as shown in the Plans.

7. Provide adequate grounding conductors, rods, connectors, and other infrastructure to ground completely, and in compliance with local, state, and national codes, all electrical components.

8. Removal, hauling, and disposal of existing switchgear and any and all electrical waste resulting from work described herein. Dispose of materials in compliance with local ordinances and these Specifications.

9. All other incidental work necessary to complete Site Electrical Renovations in accordance with the Contract Documents.

**Bid Item No. 9 – Connection to Existing Piping**

A. Units: Each (EA)

B. Measurement: Each individual completed connection to existing water piping and facilities at the locations shown in the Plans.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Connection to Existing Piping.

D. Scope of bid item: Work for Connection to Existing Piping includes, but is not limited to the following:

1. Tie-in to existing water piping as shown on the Plans.

2. Verification of adjacent utilities.

3. Pipe, adapters, fittings, thrust blocks, all joints and restraints, and connections to existing pipes.

4. Furnish and install valves in accordance with the Plans and Specifications.

5. Removal of existing piping, temporary bulkheads, fittings, blow offs, thrust blocks and blind flanges, as required.

6. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.

7. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.

8. Removal and disposal of any vegetation within the point of connection, as shown in the Plans, including all labor, equipment, materials, and miscellaneous costs to perform this work

9. Coordination and notification requirements to water service providers and customers for temporary disruption of service.

10. Control/management of groundwaters and dewatering, as needed.

11. Disinfection of all wetted parts used to establish connections to existing mains, in accordance with these Specifications.

12. Potholing of any utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed connection(s).

13. All other incidental work necessary to complete Connection to Existing Piping in accordance with the Contract Documents.

**Bid Item No. 10 – 6" HDPE Intake Piping**

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of water line constructed using open trench construction methods per the Contract Documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for 6" HDPE Intake Piping shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: 6" HDPE Intake Piping shall include, but is not limited to the following:

1. Furnish and install completely, in accordance with the Plans and Specifications, all pipe, adapters, fittings, valves, and associated appurtenances.
2. Furnish and install completely all Identification/warning tape and tracer wire.
3. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Potholing of any existing utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed water main(s).
7. Verification and protection of adjacent existing utilities.
8. Control/management of groundwaters.
9. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.
10. And all other incidental work necessary to implement 6" HDPE Intake Piping complete, in place, and in accordance with the Contract Documents.

**Bid Item No. 11 – 8" PVC Discharge Piping**

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of water line constructed using open trench construction methods per the Contract Documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for 8" PVC Discharge Piping shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: 8" PVC Discharge Piping shall include, but is not limited to the following:

1. Furnish and install completely, in accordance with the Plans and Specifications, all pipe, adapters, fittings, valves, and associated appurtenances.
2. Furnish and install completely all Identification/warning tape and tracer wire.
3. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Potholing of any existing utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed water main(s).
7. Verification and protection of adjacent existing utilities.
8. Control/management of groundwaters.
9. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.
10. And all other incidental work necessary to implement 8" PVC Discharge Piping complete, in place, and in accordance with the Contract Documents.

**Bid Item No 12 – Desalination Yard Piping**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Desalination Yard Piping.

D. Scope of bid item: Work for Desalination Yard Piping includes, but is not limited to the following:

1. Removal of existing piping, temporary bulkheads, fittings, and valves, as shown in the Plans.
2. Furnish and install completely, in accordance with the Plans and Specifications, all pipe, adapters, fittings, restraints, valves, and associated appurtenances.
3. Coating of above ground PVC piping as shown in Plans and in compliance with the Specifications.

4. Verification of adjacent utilities.
5. Potholing of any utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed piping.
6. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
7. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
8. Control/management of groundwaters and dewatering, as needed.
9. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.
10. All other incidental work necessary to complete Desalination Yard Piping in accordance with the Contract Documents.

**Bid Item No 13 – Discharge Wellhead Piping**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Discharge Wellhead Piping.

D. Scope of bid item: Work for Discharge Wellhead Piping includes, but is not limited to the following:

1. Removal of existing piping, temporary bulkheads, fittings, and valves, as shown in the Plans.
2. Furnish and install completely, in accordance with the Plans and Specifications, all above ground pipe, adapters, fittings, restraints, support, valves, and associated appurtenances, including the proposed stainless steel wellhead cover and fasteners/anchors for the Discharge Well.
3. Coating of above ground PVC piping as shown in Plans and in compliance with the Specifications.
4. Verification of adjacent utilities.
5. Potholing of any utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed piping.
6. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
7. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
8. Control/management of groundwaters and dewatering, as needed.
9. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.

10. All other incidental work necessary to complete Discharge Wellhead Piping in accordance with the Contract Documents.

# ALTERNATE BID ITEMS:

### ALT 1 – Remove and Replace 12" Intake Well Pipe

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of water line constructed using open trench construction methods per the Contract Documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Remove and Replace 12" Intake Well Pipe shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: Remove and Replace 12" Intake Well Pipe shall include, but is not limited to the following:

1. Furnish and install completely, in accordance with the Plans and Specifications, all pipe, adapters, fittings, valves, and associated appurtenances.
2. Furnish and install completely all Identification/warning tape and tracer wire.
3. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Potholing of any existing utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed water main(s).
7. Verification and protection of adjacent existing utilities.
8. Control/management of groundwaters.
9. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.
10. And all other incidental work necessary to implement Remove and Replace 12" Intake Well Pipe complete, in place, and in accordance with the Contract Documents.

### ALT 2 – Remove and Replace 8" Brine Discharge Pipe

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of water line constructed using open trench construction methods per the Contract Documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Remove and Replace 8" Brine Discharge Pipe shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of bid item: Work for Remove and Replace 8" Brine Discharge Pipe includes, but is not limited to the following:

1. Removal of existing piping, temporary bulkheads, fittings, and valves, as shown in the Plans.
2. Furnish and install completely, in accordance with the Plans and Specifications, all pipe, adapters, fittings, restraints, valves, and associated appurtenances.
3. Furnish and install completely all Identification/warning tape and tracer wire.
4. Coating of above ground piping as shown in Plans and in compliance with the Specifications.
5. Verification of adjacent utilities.
6. Potholing of any utilities, either shown on the plans or marked in the field, in advance of excavation that may conflict with the proposed piping.
7. Trenching, hand-digging, exposing, backfilling, compaction, and surface pavement and striping restoration, where required.
8. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
9. Control/management of groundwaters and dewatering, as needed.
10. Pressure testing and disinfection per MCWD Standard Specifications and these Specifications.
11. All other incidental work necessary to complete Remove and Replace 8" Brine Discharge Pipe in accordance with the Contract Documents.

**ALT 3 – Well Rehabilitation**

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Well Rehabilitation.

D. Scope of bid item: Work for Well Rehabilitation includes, but is not limited to, the following.

1. Mobilization and set up of all necessary equipment, materials, storage tanks, and temporary pumps.

2. Cleaning and flushing of existing intake and discharge well screen and casing, including acid/bio-dispersant treatment, hydro-jetting, and the removal of all accumulated sediment and debris.
3. Removal, hauling, and disposal of accumulated sediment and solids in compliance with local ordinances and these Specifications.
4. Zone pumping and specific capacity pump test of the intake and injection wells, including handling and disposal of all discharged well water.
5. Development of Well Access Plan and Well Water Disposal plan, as defined in Specification Sections 01 11 00 and 33 01 10.91.
6. Video survey, inspection, and report of rehabilitated intake and discharge wells.
7. Patching and rehabilitation of concrete well seal and wellhead, for both the injection well and intake well, including installation of new anchor bolts.
8. Furnish and install wellhead cover caps.
9. All monitoring well rehabilitation, including removal of sediment and debris, surging and bailing of monitoring wells, repairs to existing casings, and providing traffic-rated box and cover.
10. All other incidental work necessary to complete Well Rehabilitation in accordance with the Contract Documents.

**END OF SECTION**

**SECTION 01 30 00**

**ADMINISTRATIVE REQUIREMENTS**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This section covers the specific administrative requirements for the Work identified in these Contract Documents.

1.02 PROJECT CONTROL

A. The Owner or Owner's Representative will outline and detail communication, correspondence and coordination procedures at the Project pre-construction meeting.

B. Refer to Section 01 11 00 for details on scheduling and timing of the Work.

1.03 LOCATIONS, ELEVATIONS, AND LAYOUT OF WORK

A. Contractor to verify all dimensions, measurements, and depths needed for proper ordering of materials prior to ordering said materials and as shown in the Plans.

B. Grade elevations shown for various parts of the Work are taken from a benchmark shown on the Drawings, or if not shown, will be designated by the Owner. In case of conflict therein, notify the Owner in writing before starting work.

C. Contractor shall lay out the Work and provide surveys required for alignment and elevations of the Work, and pay all costs, therefor. Provide necessary lines, levels, locations, measurements and markers for all of the Work and be responsible for their accuracy. Refer to Section 02 21 00, Surveying.

1.04 PRE- AND POST-CONSTRUCTION PHOTOGRAPHS AND VIDEOS

A. Provide pre-construction, progress, and post-construction photographs and videos per Para. 3.10, Section 01 35 00, Special Project Procedures.

1.05 SCHEDULES AND MEETINGS

A. Planning and Scheduling: Provide a project schedule as outlined herein, addressing the scheduling items in Section 01 11 00:
   1. Refer to Article 2 and Article 4 of Document 00 72 00, General Conditions, and Section 01 32 16, Construction Progress Schedule, of these Technical Specifications for content and format requirements for the project schedule and all updates.
   2. Provide updated project schedules per Section 01 32 16, including realistic activity sequences and durations, allocation of labor and materials, processing of shop drawings, samples, and purchase and delivery of products requiring

long lead-time procurement. Each activity shall be explicit in definition and location of work.

B. Project Meetings:

1. Contractor or his/her duly appointed representative shall attend project meetings at regular weekly intervals, unless another interval is set by the Owner or Owner's Representative.
2. Attendance shall be limited to the Contractor and his immediate subordinates, subcontractors where so specified, the Owner, and representatives of the Engineer and Consultants, as requested.
3. Owner, or Owner's duly appointed representative, will keep minutes of meetings; with copies sent to all who attend. Meetings shall be held at the job site, or Owner offices depending on meeting agenda, duration of meeting or other considerations by Owner.

**END OF SECTION**

**SECTION 01 32 16**

**CONSTRUCTION PROGRESS SCHEDULE**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This Section covers the specific requirements for the Construction Progress Schedule, using the Critical Path Schedule Method.

B. Work Included in This Section. Principal items are:
   1. Critical Path Method (CPM) Schedule Printouts and Plot
   2. CPM Schedule Narrative

1.02 SUBMITTALS

A. Provide one PDF of each of the following schedule submittals for the Owner's review,
   1. Baseline schedule, to be provided at least 7 days prior to the Pre-Construction Meeting.
   2. Progress schedule updates, provided on a monthly basis, with narratives following the procedures identified in Article 4.04 of Document 00 72 00, General Conditions.
   3. 3-week look ahead schedule, including 1-week as-built schedule, to be provided at the weekly coordination meetings described in Section 01 30 00, Administrative Requirements.

## PART 2 PRODUCTS

2.01 GENERAL

Submit a CPM analysis for construction progress control. Clearly indicate all construction activities and sub-activities on a time-oriented basis with the critical path fully identified for all activities. Update and resubmit the schedule as indicated herein; flag all slippages and missed mileposts and provide a narrative description of proposed corrective actions.

A. Include the following minimum information for each activity and critical path item:
   1. Date of initial submittal, as applicable.
   2. Ordering dates for long lead-time items.
   3. Dates for arrival of materials on site, including both Contractor and Owner Furnished Equipment (if any).
   4. Start of work on the item.
   5. Completion of work on the item.
   6. Start-up and check out.
   7. Testing.
   8. Final cleanup.
   9. Final completion.

B. The CPM schedule shall demonstrate the Contractor's plan for fulfilling all Contract requirements and shall include review time for submittals.

C. Progress Payment Printout. Include with the CPM schedule a computerized Job Progress Report Form. The form shall include all items listed in the cost breakdown provided to the Owner and shall include the following:
1. Total units required for the Work.
2. Units completed to-date.
3. Units completed this month.
4. Unit cost.
5. Total cost this month.
6. Total cost to-date.

The columns shall be appropriately summed indicating total project cost, total work completed to-date and total work this month. Obtain Owner's approval of printout format.

2.02 FORMAT

A. Size: Prepare for plotting on 11 x 17-inch paper.

B. Technique: The diagram technique to be used shall be in accordance with conventional CPM activity (I-J) technique set forth in the Associated General Contractors of America publication: "CPM in Construction, A Manual for General Contractors".

C. Activity Descriptions: Select activity descriptions which clearly indicate the work task.

D. Duration - Work Days Required: Indicate each CPM trade activity utilizing a standardized workday calendar. Said calendar will be based on a 5-day week. Activities shall be selected such that their durations are not less than 5 days nor more than 20 days, with the exception of long lead-time procurement. Additional nodes or activities shall be used as required.

E. Activity Listing: Provide the following activity listings:
1. I-J node consecutive listing with activity description starting from lowest numbered node to highest numbered node.
2. Listing of activities by early start consecutive from first early start item to last early start item.
3. Listing of all activities on the critical path with start and finish dates.

**PART 3 EXECUTION**

3.01 INITIAL SUBMITTAL

A. Within 14 days after receipt of Notice of Award, or 7 days prior to the pre-construction kickoff meeting, whichever occurs sooner, submit for review and approval the complete CPM network for this Contract work. The network shall be prepared to assign costs to each activity item indicated for such work.

B. Review and Approval:

1. Within 7 days after receipt of the initial CPM network activity listing, the Owner will meet with the Contractor for joint review, correction or adjustment of the Contractor's proposed approach. Within 7 days after the joint review, the Contractor shall submit a revised CPM network reflecting comments offered during the joint review. The Owner will review this resubmission and may accept it as submitted. The accepted CPM will constitute the Contractor's project work schedule until it is subsequently revised by the Contractor.
2. Acceptance of the CPM is not to be construed as concurrence by Owner that schedule is reasonable or achievable. Any omission of project work from the CPM network or activity listing, otherwise required for Contract compliance, shall not excuse the Contractor from completing such work within any applicable completion date as determined by the Owner.

3.02 PROGRESS SCHEDULE UPDATES

A. On a monthly basis, or as agreed; on a date mutually agreed upon, a job-site meeting will be held to review the CPM network, activity listing, and job progress.

B. The conditions under which a revision of the schedule will be required are as follows:
1. When delay in completion of any work item or sequence of work items results in an estimated extension of project completion by either 7 days or by 10 percent of the remaining duration of time to complete the Contract, whichever is less.
2. When delays in submittals or deliveries or work stoppages are encountered, which make replanning or rescheduling of the work necessary.
3. When the schedule does not represent actual prosecution and progress of the work.
4. When Contract modification necessitates schedule revision, submit a subnetwork analysis of all change work with his Proposal. If approved, this subnetwork will become a part of the approved schedule.

C. As part of this review, prepare a brief narrative report relating to the status of construction, submittals, approvals, and procurement. Indicate in the report areas where problems exist and are anticipated and recommend corrective action needed to be taken by the Owner or by the Contractor.

D. Progress schedule updates shall be submitted concurrently with the monthly progress payment submittal.

3.03 3-WEEK LOOK AHEAD SCHEDULE

A. The 3-week look ahead schedule shall be submitted on a weekly basis prior to the weekly coordination meeting.

B. Submittal shall include:
1. 1-week as-built schedule detailing the actual work activities performed by the Contractor in the preceding week.
2. Schedule of planned activities for the current and following two weeks, including the anticipated duration of each activity.

3.04 CONTRACTOR'S REPRESENTATIVE

A. Contractor shall designate an authorized representative who shall be responsible for production and review of the network diagram and who shall assume responsibility for reviewing progress of the work with the Owner.

B. The Contractor's representative shall have direct control and complete authority to act on behalf of the Contractor; and such authority shall not be interrupted throughout the duration of the Contract, without approval of the Owner.

3.05 PROGRESS PAYMENT

A. The Job Progress Report, including the progress schedule update as defined in Paragraph 3.02 of this Section, will constitute the basis for monthly payment. Payment will not be made until the Job Progress Report is approved. No payment shall be made until obsolete CPMs are updated and the CPM is accepted by the Owner.

3.06 PAYMENT FOR CPM

A. Include all costs of preparing and updating the CPM as specified in Section 01 20 00, Price and Payment Procedures.

**END OF SECTION**

**SECTION 01 33 00**

**SUBMITTAL PROCEDURES**

## PART 1 GENERAL

1.01 DESCRIPTION

This Section covers requirements for submittals, in addition to those stated elsewhere in the Contract Documents, and forms a part of all other Specification Sections in which submittals are specified or required. Refer to the specific Sections and Divisions of the Specifications for additional submittal requirements.

A. Submittal Requirements Included in This Section.

1. Number of submittal copies required.
2. CPM progress schedule.
3. Shop drawings.
4. Samples.
5. Materials lists and equipment data.
6. Instruction (operation and maintenance) manuals.
7. Installation instructions.
8. Seismic calculations.
9. Record drawings and specifications.
10. Certificates.
11. Schedule of values.

B. Submittal Requirements in General Conditions and Other Sections.

1. Product Substitution Requirements, Article 7.04 and 7.05 of the EJCDC General Conditions.
2. Applications for payments, Article 15 of the EJCDC General Conditions.
3. Section 01 70 00 – Execution and Closeout Requirements
4. Section 01 32 16 – Construction Progress Schedule
5. Schedule of testing laboratory services.
6. Written guarantees and warranties.
7. Factory test reports.
8. Manufacturers' certified reports.
9. System validation test procedures and results.

C. Agency Standards.

1. Public Agency standards included in these Contract Documents shall allow "or equal" and substitutions, except where specifically indicated otherwise, to be considered by the Engineer per Article 7.04 and 7.05 of the EJCDC General Conditions.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION

3.01 SUBMITTAL - GENERAL REQUIREMENTS

All items required to be submitted for review shall be furnished by and at the expense of the Contractor and any work affected by them shall not proceed without such review. Except for record documents, test plans, and instructional manuals for operation and maintenance, submittal shall be approved before the material or equipment covered by the submittal is delivered to the site.

A. Number of Submittals.

1. General. Unless otherwise specified, all submittals shall be in electronic (PDF) file format.

2. Samples. Provide the number of samples for each material or equipment item in accordance with Paragraph 3.04 herein and as required in the respective section of these Specifications.

3. Manufacturer's Instruction Manuals. Provide the number of copies of the submittals in accordance with Paragraph 3.01A above and as specified in other sections of these Specifications.

B. Deviations From Contract Documents. In the Submittal Transmittal, provide the following:
1. A statement that the submittal conforms to the Contract Documents; or
2. Where Contractor's submittal deviates from the Contract Documents, provide written explanation and detail of such deviations for Engineer's review.

C. Method of Submittal. Equipment which is specified in one section of the Specifications shall not be combined in a single submittal with equipment specified in other Sections of the Specifications, unless unit responsibility for a package system is required. In each transmittal the Contractor shall state the Owner's Project Number and Name, Name and Address of Contractor, Name and Address of Subcontractor, Manufacturer, Supplier or Distributor as applicable, Plan Reference and Specification Section, Articles, and paragraphs to which the submittal pertains; accompanying data sheets, catalogs, and brochures shall be identified in the same manner. Submittal transmittals shall fully index all items submitted.

D. Piecemeal Submittals. Except for reinforcing steel submittals, piecemeal submittals will be returned unreviewed. However, for mechanical equipment and the like, separate submittals for embedded items, embedded metal work and anchors will be accepted for review.

E. Number of Submittal Re-Reviews. The Owner will provide required submittal/re-submittal review up to three occurrences per submittal. Contractor shall reimburse the Owner the cost of Owner's, Owner's Representative's, and Engineer's time required for all subsequent reviews beyond three reviews. Such costs for excessive review of incomplete or non-conforming submittals shall be deducted from Contractor's monthly pay requests at the time such charges are incurred.

F. Engineer's Submittal Review Schedule. Engineer will review and return submittals within 10 working days from date of receipt from Owner's Representative. For complex submittals, Engineer may require additional review time; Contractor shall anticipate such review of complex submittals in overall Project Schedule, with no basis for Contract Time extension unless initial review time exceeds 20 working days by Engineer. Engineer will review and return re-submittals within 5 working days from the date of receipt from Owner's Representative.

G. Contractor Submittal Log. Contractor shall submit and maintain a submittal log showing their anticipated project submittals.

3.02 CPM PROGRESS SCHEDULE

A. Refer to Section 01 32 16 – Construction Progress Schedule.

3.03 SHOP DRAWINGS

A. Title Block and Identification. On each shop drawing, provide a space for the Engineer's Submittal approval or correction stamp and a title block showing the following:

1. Name and address of Contractor.
2. Name and address of Subcontractor, manufacturer, supplier, or distributor, as applicable.
3. Name and address of Owner.
4. Date, scale of drawings, and identification number.
5. Contractor's review and approval stamp.
6. Owner's Project Number (if applicable).
7. Drawing Reference and Specification Section reference.
8. Project Name.

B. Preparation and Size. Details and information shall be clearly drawn, dimensioned, noted, and cross referenced. Unless otherwise approved, prepare shop drawings in PDF format, with drawings formatted to print of the same size as the Contract Drawings.

C. Data. Unless the following data is included in instruction manuals or equipment data submitted prior to or with the shop drawings, submit with the shop drawings complete catalog and technical data for all manufactured products, materials, machinery, and equipment covered by the shop drawing submittal. Include data showing for each item, as applicable, the following information:

1. Manufacturer's specifications and details.
2. Applicable technical data and performance curves.
3. Preparation, assembly, and installation instruction with allowable tolerances.
4. Connection requirements.
5. Pre-start-up servicing and operating methods.
6. Other data and information necessary to demonstrate that the proposed items conform to the Contract Documents.

D. Information Required. Shop drawings shall contain details and information fully developing the pertinent Contract Document requirements and such other information as may be specified or required for approval, including but not limited to:

1. Related work with cross references to applicable portions of the Contract Documents.
2. Dimensions, including variations between indicated dimensions and actual conditions.
3. Physical configurations with critical dimensions for clearance, access, and servicing.
4. List of materials, including fasteners and connectors.
5. Structural construction and assemblies, welds shown by AWS symbols, and each fastener and connector shown by type and class.
6. Grouting work, including grouting space and material.
7. Concrete foundations and bases for machinery and equipment including joints, joint filler and sealer, and reinforcing.
8. Anchor bolt details showing type and class, sizes, embedment, projections, and locations measured with respect to permanent structural features. An anchor bolt template shall be shown on the Shop Drawings and shall be furnished unless waived in writing by the Owner.
9. Protective coatings and factory finishes fully described as to materials, number of coats, plated and metallic coating finishes, treatments, and similar information, all based on specified requirements. The term "as specified" is not acceptable for this purpose.
10. Machinery and equipment details. Standard catalog items need not be illustrated in detail, but indicate and detail sizes, supports, and connections.
11. Location of auxiliary items that are parts of machinery and equipment including sight glasses, petcocks, gauges, lubrication fittings and access, and maintenance monitoring devices.
12. Piping systems and piping, including layout, fittings, valves, appurtenances, hangers and supports, and sleeves.
13. Electrical equipment showing plans, elevations, sections, arrangements, materials, anchor bolts, supports, weights, wiring and circuit diagrams, internal

connections, busses, grounding, conduit spaces, layout of instruments, gauges, meters, and other components.

14. Underground duct banks showing typical details of conduits, joints, spacers, and means of securing conduits in place during concrete placement.

15. Dielectric connections and materials and methods to be used to isolate dissimilar materials.

16. Full-size lettering layouts for data plate and nameplate inscriptions.

17. Written descriptions fully describing the operation of all control circuits, start-up sequencing, shutdown sequencing, and alarms.

E. Details and Connections. Satisfactorily detail all connections required to complete the Work, including details necessary to make indicated or specified additions to existing work or to provide connections for future work. Design connections and parts of strength to withstand, without adverse deflection or stress, all loads or pressures to which they may be subjected and to develop the strength of the members or parts connected. In no case shall the connections, parts, or details be inferior to those required by the Contract Documents.

F. Related Work. The term "by others" is not acceptable for the description of related work shown in the shop drawings. Clearly note by name or description the Contractor, Subcontractor, or trade to provide such related Work; where such name or description is missing, it shall be understood and agreed that the Contractor is to furnish and install such related Work.

G. Clearances. Do not proceed with any related Work that may be affected by piping, machinery, equipment, or other work therein until shop drawings and data showing all components, with acceptable clearances have been approved.

H. Composite Shop Drawings with Installation Layouts. Prepare and submit drawings, wherever specified or required, to resolve tight or conflicting field conditions. Show dimensional plans and elevations of the materials or equipment of all trades in the involved area or space, and include complete information as to arrangements, locations, clearances, avoidance of interferences, access, sizes, supports, connections, services, assembly, disassembly, and installation. Composite shop drawings and layouts shall be coordinated in the field by the Contractor and his Subcontractors for proper relationship to the Work of all trades, based on field conditions, and shall be checked and approved by them before submittal. Contractor shall have competent technical personnel readily available for such coordinating and checking.

3.04 SAMPLES

A. Identification. Label or tag each sample or set of samples identifying the manufacturer's name and address, brand name, catalog number, intended use and other data specified in Article 3.01.B herein.

B. Colors, Patterns, and Textures. For items required to be of selected and approved colors, patterns, textures, or other finish, submit sufficient samples to show the range

of shades, tones, values, patterns, textures, or other features corresponding to the instructions and requirements specified.

C. Factory Finish Colors. Colors of material specified to be furnished with a factory finish are subject to approval. Submit duplicate samples of factory finishes showing the full range of available colors for selection and approval when requested by the Owner.

3.05 MATERIALS LISTS AND EQUIPMENT DATA

Materials lists and equipment data shall be submitted for all items proposed to be incorporated into the Work. In determining acceptability, consideration will be given to the availability of maintenance and replacement parts and materials, the availability of manufacturer's technical representatives, other factors that relate to the maintenance and repair of installed items without excessive inconvenience to the Owner, guarantees and warranties, as well as determination of conformance with the Contract Documents.

A. Material Lists. Submittal copies of Material Lists shall be provided where specified in other Sections, and the number of copies submitted shall be as stated in Paragraph 3.01.A herein.

B. Equipment Data. Submittal copies of equipment data shall be provided in accordance with other Sections and the number of submittals shall be as stated in Paragraph 3.01.A herein. Submittals for equipment incorporating logic circuits shall include a draft of a detailed theory of operation. Data shall be submitted in sets covering complete systems or functioning units.

3.06 INSTRUCTION (OPERATIONS AND MAINTENANCE) MANUALS

Instruction Manuals shall comply with the requirements of other Sections, and the following

A. The manufacturer's instruction or O&M manuals required by these Specifications shall be specific to this project and to the equipment being furnished.

B. It is the intent that the instruction manuals be a complete document on the respective equipment item(s), independent of any separate shop drawing submittals, for the information and use by operation and maintenance personnel. As such, the manuals shall contain at a minimum, all approved shop drawing data necessary to describe the respective equipment and conform to the requirements of these Contract Documents, wiring diagrams and detailed circuit operation description, and performance curves and data.

C. The index furnished for each manual shall address all of the content categories to facilitate their being located by the reader. Categories which are considered to be not applicable or not required shall be identified as such in the index.

D. For each class of equipment or machinery identify the name, address and telephone number of the manufacturer, supplier and closest authorized service organization or company. Include this information at the beginning of each respective equipment manual.

3.07 INSTALLATION INSTRUCTIONS

Submit two copies of manufacturers' installation instructions for material and equipment incorporated in the Work to the extent specified in other Sections and Divisions of the Specifications or requested by the Owner for its review. Installation instructions will be reviewed for general adequacy only. After review, the Contractor shall distribute copies to all those involved with the installation.

Submit this information sufficiently in advance of the Work to ensure proper coordination of the respective equipment installation into the Work. In no case furnish this information later than delivery of the respective material or equipment. Payment for materials and equipment delivered will not be approved without submittal of the respective manufacturer's installation instructions.

3.08 OTHER SUBMITTALS

Provide copies of other submittals such as calculations, manufacturer's certified reports, operational demonstration and system validation reports specified in other Sections and Divisions of the Specifications.

3.09 STORAGE INSTRUCTIONS

For each equipment and material item furnished, provide for the Owner's records 2 copies of the manufacturer's recommended instructions for storage of the respective equipment or material. The instructions shall address conditions both before installation and (for mechanical, electrical and instrumentation equipment) after installation but before placing into continuous operation.

Submit manufacturer's storage instructions either prior to delivery of the material/equipment or with the request for payment of materials delivered. Payment for materials delivered will not be approved without submittal of the manufacturer's storage instructions.

3.010 FORM OF APPROVAL

A. Copies of submittals which are returned to the Contractor and which are subject to approval will be marked with notations A, B, B-R, C, D, or E, in which case the action so indicated shall be taken by the Contractor; alternatively, Engineering will use Submittal approval or correction stamp with similar notations, defined as follows:

1. A: No Exceptions Taken (Resubmittal Not Required). Accepted subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission. Does not constitute approval or deletion of specified or required items not shown in the partial submission. Engineer's approval of submittal does not relieve the Contractor of full responsibility to comply with all aspects of the Contract Documents.

2. B: Make Corrections Noted (Resubmittal Not Required). Same as A, except that minor corrections as noted shall be made by the Contractor.

3. B-R: Make Corrections Noted (Resubmit for Record Purposes). Same as B, except that resubmittal is required.

4. C: Amend and Resubmit. Rejected because of major inconsistencies or error which shall be resolved or corrected by the Contractor prior to subsequent review by the Design Consultant.

5. D: Rejected (Resubmit). Submitted material does not conform to Drawings and Specifications in major respect, i.e., wrong size, model, capacity, or material.

6. E: Received for Record Purposes Only. Applies to submittals which are required but not reviewed, such as shoring submittals.

B. Returned copies of drawings marked with either notation A, B, or B-R authorize the Contractor to proceed with the fabrication, installation or construction, or any combination thereof, covered by such returned drawings or material submittals, provided, that such fabrication, installation or construction shall be subject to the comments, if any, shown on such returned copies and to the Contract requirements whether or not specifically referenced. Although fabrication may proceed on a notation B-R, Contractor shall incorporate the comments, resubmit, and obtain notation A before release for shipment can be granted. Failure to satisfactorily address the review comments, shall result in designation of the resulting Work as being defective.

C. Returned copies of drawings marked with notation C or D shall be corrected as necessary and revised drawings shall be submitted in the same manner as before. Contractor shall not proceed with any portions of the planned Work affected by the materials identified in the returned submittals until the revised documents have been reviewed by the Engineer and returned with a notation of A, B, or B-R.

3.011 ENGINEER'S REVIEW OF SUBMITTALS

A. Refer to Article 7.16.C of the EJCDC General Conditions.

3.012 RECORD DRAWINGS AND SPECIFICATIONS

A. Refer to Section 01 70 00, Execution and Closeout Requirements.

3.013 CERTIFICATES

A. Each certificate required under the Contract or in any of the following Sections shall be signed by the individual, office, or agent lawfully authorized to execute the certificate, and such authority shall be cited in the certificate by title, description, or other acceptable evidence. All certificates shall be sworn as to the correctness and validity of the contents. Where specifically required in the respective Section of the Specifications, certificates shall be notarized and duplicate copies of required certificates shall be notarized to be true copies.

**END OF SECTION**

**SECTION 01 35 00**

**SPECIAL PROJECT PROCEDURES**

## PART 1 GENERAL

1.01 SUMMARY

A. This Section includes:
1. Protection of improvements
2. Protection of Private and Public Property
3. Utility potholing
4. Existing utilities
5. Rights-of-way
6. Protection and restoration of existing pavement
7. Protection of existing hardscape
8. Protection of designated habitat rehabilitation areas
9. Excavation notification
10. Construction Documentation/Photographs/Videos

1.02 SUBMITTALS

A. Potholing Report

## PART 2 PRODUCTS

2.01 NOT USED

## PART 3 EXECUTION

3.01 PROTECTION OF EXISTING IMPROVEMENTS

A. Protect all existing utilities and improvements not designated for removal and restore damaged or temporarily relocated utilities and improvements, immediately, to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.

B. Contractor shall protect the existing intake and discharge wellheads from unauthorized access by installing temporary wellhead covers, as shown in the Plans, at the end of each working day before and during all well rehabilitation efforts until the wellheads are permanent covered.
1. The wellheads shall be considered permanently covered once all proposed piping improvements are furnished and installed as shown in the Plans and per the requirements of these Specifications.

3.02 PROTECTION OF PRIVATE AND PUBLIC PROPERTY

A. Protect all private and public property from damage due to its activities. If any damage does occur to public or private property as a result of the Contractor's operations, the Contractor shall be responsible for the repair of the property, to pre-construction conditions or better.

3.03 UTILITY POTHOLING

A. Pothole Locations: The Contractor shall perform exploratory excavations sufficiently ahead of construction for all known crossings, either shown on the Plans, or marked on the pavement/ground/surface, so as to identify any unforeseen conflicts with the proposed construction a sufficient time in advance of construction to avoid possible delays to the Contractor's work. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

B. Potholing Report: The Contractor shall submit a written report at least 10 working days prior to performing any work for the related underground facilities or improvements. The written report shall include the following information:
   1. Size, type, and material of the facility exposed.
   2. Accurate horizontal and vertical locations.
      a. The vertical location shall be the top of pipe, flow line, or bottom of the pipe, as shown on the plans, or if not designated, whichever is the critical location for the proposed crossing or connection.

C. As-Built Records: Contractor shall identify the locations of all utilities potholed on the as-built record drawings, including pipe material, size, and accurate horizontal and vertical locations, at no additional cost to Owner.

D. The cost of potholing shall be considered appurtenant to Bid Item 1 – Mobilization/Demobilization, as defined in Section 01 20 00, Price and Payment Procedures. There will be no separate payment for potholing.

E. Refer to Section 01 11 00, Paragraph 1.9, for work order/sequencing after completing potholing operations.

3.04 EXISTING DRY AND WET UTILITIES

A. General: The Contractor shall protect all above ground and underground dry and wet utilities and associated improvements that may be impaired during construction operations. All water facilities requiring modification as indicated in these contract documents, shall be protected at all times and/or Contractor provisions made for temporary controls, so as to allow full functionality of these systems at all times.

B. Contractor shall be responsible for coordination and communication with all utility agencies during construction.

C. Locations shown: The known existing buried utilities and pipelines are shown on the Plans in their approximate location, and also may be marked in the field by the utility representative(s). The Contractor shall exercise reasonable care in avoiding damage to

all utilities and be held responsible for their repair if buried facilities so located are damaged.

D. Services Assumed: When underground distribution mains are shown on the plans or marked by the utility companies, the Contractor shall assume that every property parcel will be served by a service connection of each type of facility. Not all laterals are shown in the drawings.

E. Work by Utilities: During the course of the Contract, work may be performed by the utility companies, Marina Coast Water District, State Parks, or by the County of Monterey to inspect, operate, relocate, abandon or install facilities. The Contractor shall coordinate with the utility companies—and other agencies, as necessary—regarding such work. Such coordination shall be included within the Contract bid and there will be no separate payment therefor. Refer to Section 01 30 00 – Administrative Requirements.

F. Utilities to be Moved: Should it become necessary to move the property of any public utility or franchise holder, the Contractor shall notify the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

G. Right of Access: The right is reserved to Marina Coast Water District, State Parks, and to the owners of public utilities and franchises to enter at any time upon any property owned by such entity; or upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the work of this Contract.

H. Approval of Repairs: All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.

I. Maintaining Service: All pipelines, power, telephone, communication cable, gas, water, irrigation, sewer, and storm drain systems within the work area shall remain continuously in service during all the operations under the Contract, unless specifically shown otherwise in the Contract Documents, or unless other arrangements satisfactory to the Engineer are made (by the Contractor) with the owner of said system.

3.05 RIGHTS-OF-WAY

A. The Contractor shall not perform work within the right of way or easement of any agency without first obtaining approval from that agency.

3.06 PROTECTION AND RESTORATION OF EXISTING PAVEMENT

A. General: All paved areas cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents.

B. Pavement repair shall be in accordance with Section 32 12 00, Flexible Paving, and as shown on the Plans.

C. All temporary and permanent pavement shall conform to the Contract Documents and to the requirements of the affected pavement owner. All pavements that are subject to partial removal shall be neatly saw cut in straight lines.

D. Pavement markers and markings, if necessary, shall be replaced in accordance with Section 32 17 32, Pavement Markings, and requirements of the agency or owner having jurisdiction.

3.07 EXISTING HARDSCAPE

A. General: All surface concrete or other hardscape areas cut or damaged during construction shall be replaced with similar materials and of equal material and quality to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents. All such repairs and replacements shall conform to the requirements of the affected hardscape owner.

B. Partial removal: All concrete and PCC pavement that is subject to partial removal shall be neatly saw cut in straight lines. The saw cut lines shall be extended to align with existing score lines or similar feature so as to provide a uniform appearance.

3.08 PROTECTION OF DESIGNATED HABITAT RESTORATION AREAS

A. Contractor shall exercise all necessary precautions so as not to impact, damage, or destroy any designated habitat restoration and wildlife protection areas within 100 feet of the project limits.
   1. Necessary precautions shall include, at a minimum, the installation of ESA fencing in compliance with Section 01 50 00, Temporary Facilities and Controls, along the boundary of any designated habitat restoration and wildlife protection areas within 100 feet of the project limits.
   2. Contractor shall coordinate all activities related to the protection of designated areas with the Owner and State Parks a minimum of 7 days prior to commencing work on said activities.

3.09 EXCAVATION NOTIFICATION

A. Notify Prior to Excavation: Prior to any excavation, the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire.

B. Call USA: The Contractor shall also notify Underground Service Alert (USA) **at 811** at least 2 working days, but no more than 10 working days, prior to such excavation. If a utility owner is not equipped to locate its utility, the Contractor shall locate it.

3.010 CONSTRUCTION PHOTOGRAPHS AND VIDEOS

A. Provide pre-construction, construction progress, and post-construction photographs and videos as part of the Work. Photographs shall be taken with a minimum 5-megapixel digital camera, and all photos and videos shall be provided to Owner on thumb drives, or an agreed upon cloud-based storage. Photos shall be arranged in

folders on the thumb drives, or cloud-based storage by date taken and clearly identified by location of Work. Provide further cataloging of photographs as required to clearly identify subject matter, if not self-evident on the photograph (such as utility identification).

B. Pre-Construction Photographs and Videos. Arrange a meeting time with the Owner, State Parks, and Engineer, minimum 7 days prior to taking photographs and videos, to allow Owner, State Parks, and Engineer the opportunity to accompany Contractor on the pre-construction photograph session. Provide pre-construction photographs during this walkthrough of the existing project site conditions at locations directed by Owner and Engineer. Submit the pre-construction photographs and videos within 14 days following the date photographs are taken. Include at a minimum, the following:

1. Photographs, videos, and documentation of condition of all existing improvements in the areas of Work, including laydown areas to be utilized by Contractor.
2. All public and private roads and easements along the pipeline routes as shown in the Plans, including condition of existing pavement along entire length of water main installation Work.
3. Existing condition of all storm drain, sewer utilities, gas mains and other utilities or structures in and around the areas of Work.
4. Existing conditions at tie-ins to existing MCWD piping and facilities.
5. Condition of all pipeline alignments and haul routes.

C. Post-Construction Photographs and Videos. Provide same coverage as required in Para. 3.10.B. Arrange a meeting time with the Owner, State Parks, and Engineer, minimum 7 days prior to taking photographs, to allow Owner, State Parks, and Engineer the opportunity to accompany Contractor on the post-construction photograph session. Submit final photographs as part of close-out submittals specified in Section 01 70 00.

D. Progress Photographs. Provide photographs and videos of the progress of the Work, to be provided to the Owner throughout progress of the Work. Progress photographs shall be taken at a minimum, on a weekly basis. Photographs and videos shall be taken at a minimum:

1. Intake and discharge well heads, vaults, and appurtenant features.
2. Removal of existing piping, fittings, panels, tanks, and other structures as identified in the Contract Documents.
3. Erosion control measures provided as part of the Work.
4. Existing facilities to remain, replacement facilities to be rehabilitated and/or installed.
5. Staging and construction haul routes.

**END OF SECTION**

**SECTION 01 50 00**

**TEMPORARY FACILITIES AND CONTROLS**

## PART 1 GENERAL

1.01 SUMMARY

A. Provide temporary facilities as herein specified, plus other temporary facilities, including labor, materials, services, utilities, and equipment, as may be required for proper performance of Contract, except as otherwise provided. Temporary facilities shall be approved by the Owner, and where applicable shall also be approved by the City of Marina and State Parks. Locate facilities where and as directed and maintain the facilities in safe and sanitary condition at all times until completion of Work.

B. At completion of work, or sooner when no longer needed, remove all temporary facilities, except where certain facilities are specified to remain or to be relocated for use under future contracts.

C. All Work required for Temporary Facilities and Controls shall be included in Contractor's price for mobilization, except as otherwise provided in the Contract Documents, and no separate or additional payment will be made, therefor.

1.02 CONSTRUCTION EQUIPMENT

A. Erect, equip, operate, and maintain construction equipment in strict accordance with applicable statutes, laws, ordinances, rules, and regulations of authorities having jurisdiction.

1.03 SAFETY PRECAUTIONS

A. Provide and maintain barricades, fencing, shoring, and other safety precautions as required for the Work.

B. Maintain such items for duration of Work, and repair, replace, and relocate them as necessary for safe protection.

C. Attention is directed to Safety Orders issued by the State of California, Division of Industrial Safety. Contractor shall obtain copies of Safety Orders applicable to the type of work to be performed and shall be governed by requirements thereof in construction operations.

D. Fully inform each sub-contractor and material supplier as to the requirements of applicable Safety Orders.

1.04 ROADS AND ACCESSWAYS

A. Coordinate with the Owner, the City of Marina, and State Parks for work requiring access restriction/coordination in and around rights-of-way, permanent easements,

shared staging and access areas, and property owned by the aforementioned agencies. Refer to Section 01 30 00 – Administrative Requirements.

B. Maintain access roads and parking areas in satisfactory condition during Contract time, and repair damages attributable to Work of this Project at intervals as needed. At completion of Contract, roads, parking areas and entrance ways shall be left in condition at least equal to that existing at start of Contract, except as may be otherwise required by Contract documents.

C. Permanent Improvements: Where Contract calls for permanent sidewalk, road, and other ground improvements, and such permanent improvements are completed, or essentially completed within construction period, Contractor does not have vested right to use such improvements as temporary facilities. At all times, Contractor shall protect Work provided by the Owner, State Parks, and any other entities working at the site. Repair all damages resulting from the Work required by these Contract Documents.

D. Retain responsibility for permanent improvements pursuant to General Conditions. Use of permanent improvements by Contractor shall be subject to approval by the Owner and, if applicable, by State Parks.

1.05 USE OF OWNER AND STATE PROPERTY

A. On-Site Storage and Work Areas: The Owner may allocate available on-site storage and work areas to Contractor, if available, subject to change as may be necessary by job progress, such as site development or other intervening work. Contractor shall be responsible for coordinating with the Owner, the City of Marina, State Parks, or other agencies and entities, and ultimately securing appropriate staging areas.

B. Owner and State Property and Right-of-Way: Operations shall be confined to State Parks and Owner property, designated easements and public right-of-way to greatest possible extent and shall not encroach on areas other than those designated or approved for construction access.
   1. Ascertain, observe, and comply with rules and regulations in effect, including, but not restricted to, parking and traffic regulations, hours of allowable ingress and egress as to main arteries, and the like.

C. Make detailed examination of such Owner or State Parks property at start of work and conditions shall be noted by Contractor and confirmed by Owner or State Parks.

D. TEMPORARY FENCE (TYPE ESA)
   1. Where called for on the drawings, provide temporary ESA-type fencing to protect existing trees, sensitive landscaping or other improvements shown. Install at the drip line or otherwise as shown on the drawings or directed by Engineer.
   2. ESA fencing shall be high visibility fabric, containing ultraviolet inhibitors, and consisting of one of the following:
      a. Polyethylene
      b. Polypropylene
      c. Combined polyethylene and polypropylene
   3. Testing Requirements:

a. Sample under ASTM D 4354, Procedure C.
b. Test under ASTM D 4759. All properties shall be based on Minimum Average Roll Value.
c. Identify, store, and handle under ASTM D 4873.

4. Product shall comply with the following:

| Property | Specifications | Requirements |
|---|---|---|
| Width, inches, Min. | Measured | 48 |
| Opening size inches | Measured | 1" x 1" (Min)<br>2" x 2" (Max) |
| Color | Observed | Orange |
| Grab breaking load, 1-inch grip, lb, Min. in each direction | ASTM D4632 | 260 |
| Apparent elongation percent, Min., in each direction | ASTM D4632 | 5 |
| Ultraviolet degradation, percent of original unexposed grab breaking load, 500 hr, Min. | ASTM D4355 | 70 |

5. Posts shall be wood or steel, complying with the following:
   a. Wood Posts shall be:
      1) Untreated fir, redwood, cedar, or pine and cut from sound timber
      2) Straight and free of loose or unsound knots and other defects that would render the stakes unfit for use
      3) Pointed on the end to be driven into the ground
      4) At least 2" x 2" in size and 6 feet long
   b. Steel Posts shall be:
      1) "U," "T," "L," or other cross-sectional shapes that can resist failure from lateral loads.
      2) Be pointed at the end to be driven into the ground.
      3) Weigh at least 0.75-pound per foot.
      4) Be at least 6 feet long.
      5) Have a safety cap attached to the exposed end. The safety cap must be yellow, orange or red plastic and fit snugly to the metal post.

E. Protection of Existing Utilities: Protect from damage, existing utility lines not specified to be altered by Work of this Contract; any such features damaged shall be repaired or replaced to condition equal to that existing prior to commencing work of this Contract. Unless otherwise specified, maintain existing utility service at all times during construction. Utility service lines found entering site and not indicated to remain or to be incorporated in proposed Work, shall be plugged, capped, or otherwise abandoned by Contractor in manner satisfactory to Utility Companies whose services are involved, except as otherwise required.

1.06 CONTRACTOR'S STAGING AREA

A. Contractor shall coordinate and provide suitable staging area for the Work.

1.07 CLEAN UP OF WORK AND DISPOSAL OF TRASH

A. Attention of Contractor is directed to Specification Section 01 70 00 – Execution and Closeout Requirements. Keep work and storage areas clean and free of rubbish and perform protective and clean-up work within one day of being so notified by Owner.

B. Dispose of trash resulting from Work. Recycle materials to the greatest extent practicable. Remove and dispose of trash resulting from Work in appropriate receptacles to be provided by Contractor and dispose of at an approved facility. Do not use existing nearby trash containers for depositing trash and rubbish.

1.08 DUST ABATEMENT

A. Use water wagons or spray from hoses to control dust created by outdoor work operations in areas on project property during entire period of this Contract and as directed by Owner; also, satisfactorily control dust created by operations on property used, other than project property, to satisfaction of all parties concerned.

1.09 EROSION AND SEDIMENT CONTROL

A. Implement applicable measures for erosion and sediment control during construction, in compliance with the erosion and sediment control requirements in these Division 01 Technical Specifications.

1.010 SANITARY FACILITIES

A. Do not use sanitary facilities owned by the Owner, the City of Marina, State Parks, or other contractors.

B. Toilet Facilities: Provide sufficient suitably enclosed chemical toilets, conforming to ANSI Z4.3., with urinal and hand wash station. Maintain such facilities in clean and sanitary condition at all times.

C. Drinking Water Facilities: Provide clean, sanitary and adequate drinking water.

1.011 TEMPORARY WATER

A. Make arrangements for temporary construction water as required. Contractor to coordinate with the Owner for connection requirements.

1.012 TEMPORARY ELECTRICITY

A. Provide such temporary electrical facilities as necessary for the Work, and to supply temporary lighting for work operations and temporary power for portable power-driven tools.

B. Construction Requirements:
1. Construct and maintain temporary electrical service facilities in accordance with California Code of Regulations, Title 24, Part 3, Basic Electrical Regulations, Public Utilities Commission “Rules for Overhead Line Construction” (G.O.95),

and requirements of Pacific Gas and Electric (PG&E), or other utility agencies, as applicable.

2. Contractor shall be responsible for contacting and coordinating with PG&E and other agencies, and for providing necessary applications to obtain temporary electrical service in conformance with the project schedule.
3. Materials, devices, and equipment used for these facilities shall be in good and safe condition but need not be new.
4. Electrical service equipment and utility feed shall be of adequate amperage and voltage ratings to serve electrical loads necessary to complete the Work and to serve other required loads listed in this specification.
5. Materials, devices, equipment and temporary electrical service facilities shall be removed from the site prior to final field observation and project closeout.

C. Contractor-Installed Construction Power Facilities: Temporary electrical materials and equipment furnished and installed by Contractor for required facilities hereunder shall be removed after serving their purpose.

1.013 SECURITY

A. Contractor shall be responsible for security of Work involved in this Project, during entire time of Contract. Make good all damages to Work and loss of materials due to vandalism or theft, within this responsibility. Coordinate security requirements with MCWD, State Parks, and other agencies and contractors at the job site.

1.014 CONNECTIONS TO EXISTING DISTRICT UTILITIES

A. In accordance with the approved Work Plan as required in Section 01 11 00 – Summary of Work, coordinate all Work associated with connecting to the existing MCWD systems with the respective agency. Contractor shall coordinate, with the respective agency, the limitations for the duration of water shut down while tie-in operations occur.

B. Contractor shall provide all equipment, labor, materials and resources needed to adequately monitor and control tie-in operations. As part of the approved Construction Work Plan, delineate anticipated flow conditions, required equipment to accommodate anticipated flow conditions, response times to respond to failure or malfunction of equipment, emergency contact information and staffing assignments, details of monitors and alarms, plans and details for water pressure testing and disinfection procedures for each water system tie-in.

**END OF SECTION**

## SECTION 01 57 13

## TEMPORARY EROSION AND SEDIMENT CONTROL

## PART 1 GENERAL

1.01 GENERAL

A. This Work shall consist of temporary measures needed to control erosion and water pollution during construction. These temporary measures shall include, but not be limited to, berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods. These temporary measures shall be installed at the locations where needed to control erosion and water pollution during the construction of the Project, as part of final site restoration at construction completion, and as directed by the Owner, State Parks, and the Engineer.

B. This Temporary Erosion and Sediment Control Specification presented herein serves as a minimum for the requirements of erosion control during construction. Contractor has the ultimate responsibility for providing adequate erosion control and protecting water quality throughout the duration of the Project, whether specifically shown on the drawings or not. Therefore, if the provisions herein are not working sufficiently to protect the Project areas, then Contractor shall provide additional measures as required to obtain the required protection. Contractor shall include in the bid price all appropriate means and measures to adequately provide erosion and sediment control during construction, and at final Project completion and wrap up.

1.02 MEASUREMENT AND PAYMENT

A. Payment for preparing and implementing temporary erosion and sediment control shall be included in the Erosion, Sediment, and Water Pollution Control item(s) of the Work that require such measures, and no additional compensation will be allowed, therefor. Refer to Section 01 20 00 – Price and Payment Procedures.

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 – Submittals:
   1. Proposed erosion and sediment control measures for all aspects of the Work. Include such measures in the Construction Work Plan. Refer to Section 01 11 00 – Summary of Work.

## PART 2 - PRODUCTS

A. Products used for Temporary Erosion and Sediment Control shall be per Section 21, Caltrans Standard Specifications, 2025 edition, unless otherwise specified. Materials may include hay bales, hydroseed mix, straw, fiber mats, fiber netting, wood cellulose, fiber fabric, gravel, and other suitable materials, and shall be clean, free of deleterious materials, and certified weed free.

## PART 3 - EXECUTION

3.01 OTHER PERMITS

A. Contractor shall obtain applicable permits required for this Project. Lack of listing any specific permit by the Owner or State shall not relieve the Contractor of the obligation of obtaining and complying therewith.

3.02 CONSTRUCTION

A. Stabilization of Disturbed Areas:
   1. All disturbed un-paved areas shall be restored to pre-construction condition or better, unless otherwise shown or specified.
   2. Temporary sediment control measures shall be established a minimum of 2 working days prior to time of exposure/disturbance.
   3. Permanent erosion protection measures shall be established within five (5) working days after final grading of areas.

B. Stabilization of Sediment and Erosion Control Measures:
   1. Sediment barriers, perimeter dikes, and other measures intended to either trap sediment or prevent runoff from flowing over disturbed areas shall be constructed as a first step in grading and be made functional before land disturbance takes place.
   2. Earthen structures such as dams, dikes, and diversions shall be stabilized within five (5) days of installation.
   3. Stormwater outlets and drainage swales/pipes shall also be stabilized prior to any upstream land disturbing activities.

C. Stabilization of Waterways and Outlets:
   1. All onsite stormwater conveyance channels used by Contractor for temporary erosion control purposes shall be designed and constructed with adequate capacity and protection to prevent erosion during storm and runoff events.
   2. Stabilization adequate to prevent erosion shall also be provided at the outlets of all pipes and channels.
   3. Storm Sewer Inlet Protection: All storm sewer inlets which are made operable during construction, or which drain stormwater runoff from the Work sites, shall be protected from sediment deposition by the use of filters or other acceptable means, subject to approval by the Owner and Engineer.

D. Construction Access Routes:
   1. Do not allow mud and debris onto any public roads.
   2. Where sediment is inadvertently transported onto a public road surface, the roads shall be immediately cleaned. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area. Street washing shall be allowed only after sediment is removed.

**END OF SECTION**

**SECTION 01 57 23**

**TEMPORARY STORM WATER POLLUTION CONTROL**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This section includes requirements for storm water pollution control in accordance with Caltrans Standard Specifications 2025 Section 13-1.

1.02 MEASUREMENT AND PAYMENT

A. Delete Section 13-1.04, Payment, Caltrans 2025 Section 13-1 and replace with the following:

"Payment for preparing and implementing all temporary stormwater pollution control measures and BMPs shall be included in the lump sum Bid Item No. 3 – Erosion, Sediment, and Water Pollution Control for the Work including controlling stormwater, monitoring storm water discharges, and complying with all Permit conditions."

B. This item specifically excludes groundwater dewatering which shall be paid for under a separate bid item, with no additional compensation allowed therefor.

1.03 SUPPLEMENTAL DEFINITIONS TO CALTRANS SECTION 13-1

A. "Department" shall also mean "Owner" when specifically referring to Marina Coast Water District.

B. Construction phase: Construction phases are (1) Construction including work activities for excavation, trenching, site improvements, and all other improvements shown on the drawings; and (2) Suspension where work activities are suspended and areas are inactive.

1.04 SUBMITTALS

A. Comply with Caltrans Section 13-1.01C, Submittals, and Section 01 33 00, Submittal Procedures, of these Specifications.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

3.01 OTHER PERMITS

A. Contractor shall obtain any and all permits required for this Project. Lack of listing any specific permit by the Department shall not relieve the Contractor of the obligation of obtaining and complying therewith.

3.02 Comply with the requirements of this section and Caltrans Standard Specification 2025 Sections 13-1.

**END OF SECTION**

## SECTION 01 70 00

## EXECUTION AND CLOSEOUT REQUIREMENTS

### PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Closeout Procedures.

B. Project Record Documents.

C. Operation and Maintenance Data.

D. Guaranties, Warranties and Bonds.

E. Spare Parts and Maintenance Materials.

1.02 CLOSEOUT PROCEDURES

A. Comply with procedures in this Section. When Contractor considers Work has reached substantial completion, submit written certification that Work is ready for inspection.

1.03 INSPECTION PROCEDURES

When the Work for each individual Project Site is, in the opinion of the Contractor, substantially complete, the Contractor shall call for a punch list inspection.

A. Inspection Procedures: On receipt of a written request for inspection, the Owner's Representative will schedule the inspection. If in the judgment of the Owner's Representative the project is not substantially complete, the Owner Representative will so advise the Contractor and discontinue the inspection.
   1. The Owner's Representative will repeat inspection when requested and assured that the Work has been completed.
   2. Results of the completed inspection will form the basis of requirements for final acceptance of the Work.

B. Final cleaning shall be completed prior to Owner's Representative inspection and acceptance.

1.04 PROJECT RECORD DOCUMENTS ("AS-BUILTS")

A. Per Article 7.11 of the EJCDC General Conditions, and this Section.

B. Maintain, on current basis, record drawings showing "as-built" conditions of project, subject to monthly review by Owner's Representative. Monthly pay estimates will not be processed without review and approval of record drawings by the Owner. Written confirmation that the as-builts have been properly updated shall be submitted with each pay application request. Final Acceptance of Work will not take place until record drawings are turned over to the Owner's Representative.

C. Store Project record documents separate from those used for construction. Protect from deterioration and loss in a secure, fire-resistive location; provide access to the Owner's Representative(s) during normal working hours. In the event of loss of recorded data, use means necessary to again secure the data to the Owner's acceptance; such means shall include, if necessary, in the opinion of the Owner, removal and replacement of concealing materials and – in such case – replacements shall be to the standards originally specified.

D. Before commencing backfilling of utilities or any other underground pipes, ducts, conduits, or structures, take photographs and/or videos detailing the relationship of below ground utilities to structure(s) or other physical reference point. Photos shall be in compliance with Section 01 35 00 – Special Project Procedures, categorized by location and indicating utilities and progress of Work, as specified. Provide photo(s) and/or video(s) of all connections, crossings, stubs, or other critical points. If the Contractor neglects to take such photographs and/or videos, Contractor shall uncover, at the Contractor's expense, the area(s) so neglected in order to provide the requisite photos.

E. Record Drawings: Maintain a clean, undamaged full-size bond set of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. At time of installation of replaced or rehabilitated facilities, and abandonment/removal of facilities indicated to be abandoned or removed, corresponding locations of work relating to aboveground and underground utilities, structural, and other scopes of work as may be required, shall be recorded on field record drawing set by Contractor, and reviewed with Owner's Representative. Timing of entries shall be within 24 hours after receipt of information. Do not conceal work until required information is recorded.

1. Information entered on prints shall be neat, legible, and emphasized by drawing "clouds" around changed items. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work. Date entries.
2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
3. At a minimum, the following information shall be inserted and dimensioned on record documents where applicable:
    a. The exact horizontal and vertical location of all installations and abandonments in their finished condition; all abandoned facilities shall be documented by coordinates.
    b. All changes in construction, materials and installed equipment;
    c. Adequate dimensional data, both horizontal and vertical, to allow location of covered installations;
    d. The identification of changes authorized by Change Order and the number of that Change Order;
    e. All Requests for information and the number of that Request for Information;
    f. All Field Clarifications and the number of that Field Clarification;
    g. All the Engineer's field change directives and the number of such directives, where applicable.

4. Symbols and designations used in preparing record drawings shall match those used in Contract Drawings.
5. Locate and dimension work, including stubs for future connections, with reference to permanent landmarks or buildings and indicate approximate depth below finish grade.
6. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

F. Prior to final Acceptance of Work, submit Project record documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents and signature of Contractor.

1.05 GUARANTIES, WARRANTIES AND BONDS

A. Per Article 7.17 and 14.03 of the EJCDC General Conditions.

B. Additional Guaranties/Warranties: Provide additional guarantees/warranties (in excess of two years) where specifically required by pertinent Specification Sections.
1. Provide duplicate copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.

C. Submit guaranties/warranties prior to final payment.
1. For equipment put into use with Owner's permission during construction, submit guaranties/warranties within 10 days after first operation.
2. For items of work delayed beyond date of substantial completion, provide updated guaranty/warranty submittal within 10 days after acceptance, listing date of acceptance as start of guaranty/warranty period.

1.06 DISPOSAL REPORT

A. Upon completion of Work, and prior to final payment, submit a Disposal Report. If using certified hauler and facility, submit copies of all receipts. If using other than certified facility, summarize the waste generated, sent to landfill, reused, and recycled which is attributed to Work of this Project, including copies of all receipts.

B. Final payment will not be made until the Disposal Report is received and approved by the Owner.

1.07 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting certification of final Acceptance of the Work, complete the following:
1. Submit a certified copy of the Owner Representative’s list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance for final inspection.

B. Final Inspection: The Owner’s Representative will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections (“punch-

list"), has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner.

1. Upon completion of final inspection, the Owner's Representative will prepare and submit to the Owner, a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If after the inspection, the Owner determines that the Work is complete, the Owner will accept the Work per the Article 15.06 of the EJCDC General Conditions.

**PART 2 PRODUCTS – (NOT USED)**

**PART 3 EXECUTION – (NOT USED)**

**END OF SECTION**

**SECTION 02 21 00**

**SURVEYING**

## PART 1 GENERAL

1.01 SUMMARY

A. The work under this section includes all construction surveying, setting grades and layout of facilities, and locating, resetting and recording monuments.

1.02 SUBMITTALS

A. Written report of potholing for all potholed utilities, identifying the required information identified in Section 01 35 00, Special Project Procedures.

1.03 LICENSE REQUIREMENTS

A. All survey work shall be performed under the direction of a Surveyor licensed in the State of California.

## PART 2 PRODUCTS

Not Used

## PART 3 EXECUTION

3.01 CONSTRUCTION STAKING:

A. Engineer has provided basis of survey/survey control on the drawings. Use defined survey control to establish horizontal and vertical control of all facilities to be constructed by this contract.

B. Set stakes for streets, paving, curbs and walks, underground facilities, structures, and other facilities shown on the Plans.

C. Survey facilities exposed for identified required potholes.

3.02 PROPERTY CORNER RESTORATION:

A. Comply with applicable survey monument requirements in the Monterey County Code of Ordinances.

B. Re-establish centerline monuments and property corner monuments disturbed by the Contractors activities, by a California licensed surveyor, and file the appropriate corner record or record of survey, at no additional cost to Owner.

C. Property corner markers shall be assumed to exist at all intersections of property lines shown on the plans. Centerline monuments shall be assumed to exist at the intersection of all street centerlines shown on the plans.

3.03 POTHOLING REPORT

A. Comply with Section 01 35 00 – Special Project Procedures, Para. 3.03.B.

3.04 REPORTING REQUIREMENTS

A. Elevation reports and certificates shall be on the same elevation datum as the Contract Drawings, unless directed otherwise by the Engineer.

B. Elevation reports and certificates shall identify the following:
1. Elevation Datum
2. Elevation Benchmark
3. Surveyor's Stamp and Signature

**END OF SECTION**

**SECTION 02 42 00**

**REMOVAL AND SALVAGE OF CONSTRUCTION MATERIALS**

## PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Surface demolition
2. Underground pipe and structure removal
3. Underground pipe and structure abandonment
4. Removing demolished materials
5. Salvaging Materials to District

1.2 SUBMITTALS

A. Include with the Construction Work Plan Submittal, as defined in Section 01 11 00 – Summary of Work, a preliminary list of items to be removed, salvaged and demolished for review by Engineer and Owner. Include in the Construction Work Plan, specific details for the demolition or abandonment of the existing above ground and buried piping, as identified in the Plans and in compliance with this Section and Section 01 35 00 – Special Project Procedures.

B. Project Record Documents: Accurately record actual locations of:
1. Pipes and structures removed and to be removed
2. Pipes and structures to be abandoned in place

1.3 QUALITY ASSURANCE

A. Conform to applicable codes for procedures when hazardous or contaminated materials are discovered. Refer to Article 5 of the EJCDC General Conditions.

1.4 SCHEDULING

A. Schedule all demolition in accordance with the provisions of Specification 01 11 00, Paragraph 1.9.

B. Describe demolition, removal, and salvage procedures in the Construction Work Plan and include in the project schedule.

C. Comply with the requirements for site access, traffic management, and maintaining utility service.

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the site before demolition. Notify the Owner's Representative immediately of any item(s) in question.
   1. Do not remove equipment and utilities that are necessary for continued operation of the water treatment or distribution system, without the prior approval of the Owner. Notify Owner and Owner's Representative a minimum of two working days prior to removing any active utilities and equipment from service.

B. Verify with Owner that hazardous material abatement is complete before beginning demolition (Owner is not aware of any hazardous materials). If Contractor suspects buildings, facilities, or structures to be demolished may contain asbestos, lead-based paint, and/or other hazardous materials, notify the Owner immediately of the situation and do not proceed with demolition until such time confirmation of the nature of the material(s) has been determined. Delays caused by encountering hazardous materials shall be addressed per the corresponding sections of the General Conditions.

3.2 PREPARATION

A. Call Local Underground Service Alert (USA) not less than two working days, but no more than 14 calendar days, before performing Work.

   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Notify affected utility companies before starting work and comply with utility's requirements. Refer to Section 01 35 00 – Special Project Procedures, Para. 3.09.

C. Erect and maintain temporary barriers including warning signs and lights, and similar measures, for protection of plant personnel and the public.

3.3 DEMOLITION REQUIREMENTS

A. Use of explosives is not permitted.

B. Conduct demolition to minimize dust and other airborne debris.

C. Apply water to minimize dust. Provide hoses and water connections required for this purpose.

D. Do not burn or bury materials on site. Leave site in clean condition.

3.4 SURFACE DEMOLITION

A. Within the limits shown and where indicated in the Plans, remove and dispose:
   1. All asphalt paving.

a. Base materials may be recycled and re-used for all applications where recycled base materials meet the specified material requirements of Sections 32 11 00 - Base Courses, 31 00 00 - Earthwork, and 31 23 33 - Trenching and Backfilling.

2. All concrete foundations, to at least 24 inches below existing grade.
3. All buildings, structures, foundations, above-ground piping, cabling, motors, pumps, panels, tanks, fencing, and equipment associated with the following existing structures:
   a. Existing MCWD pre-treatment area
4. All other surface features indicated to be removed such as landscape, fencing, and other surface improvements.
5. All native vegetation removed by clearing and grubbing operations.

B. Coordinate the demolition with the construction schedule to maintain access and utility service(s).

C. Rough grade the site as described in Section 31 00 00 - Earthwork.

D. Continuously clean-up and remove demolished materials from site to an authorized dump site. Do not allow materials to accumulate on site.

3.5 BURIED PIPE ABANDONMENT

A. Where abandonment of buried pipe is identified in the Plans, Contractor shall cut the existing pipe and seal the portion to be abandoned with non-shrink grout.
   1. Non-shrink grout material shall comply with ASTM C-1107.
   2. Contractor shall place non-shrink grout a minimum of 1' beyond the cut end of the abandoned pipe, and shall ensure no voids, pockets, or holes are formed in the grout seal.

3.6 BURIED PIPE AND STRUCTURE REMOVAL

A. Where removal or abandonment in place is not explicitly stated on the Plans, Contractor shall remove and dispose of indicated utility to be abandoned.

B. Coordinate the demolition with the construction schedule to maintain access and utility service.

C. Backfill excavations as described in Section 31 00 00, Earthwork.

D. Maintain utility service as described in Section 01 50 00, Temporary Facilities and Controls.

E. Record termination or capped location on Record Documents.

F. Continuously clean-up and remove demolished materials from site to an authorized dump site. Do not allow materials to accumulate on site.

G. Handling, Removal Abandonment of Asbestos Cement Pipe (if encountered):

1. Remove and dispose of asbestos cement pipe (ACP) in accordance with State of California requirements and the contract documents. Removal of ACP shall be performed by a contractor licensed and certified by Cal/OSHA for such removal. Also refer to Article 5 of the EJCDC General Conditions regarding encountering hazardous materials.
    a. Follow the AWWA guidelines for handling, removing and disposing of ACP as stated in the applicable sections of AWWA Standards C400, C401, C402, and C403 covering asbestos cement transmission and distribution pipe.
    b. Accomplish the removal of ACP by removing intact pipe sections, where possible. Pothole and expose the ACP at least two days prior to removal to verify extent of pope to be removed and appropriateness of proposed "asbestos cement pipe removal and disposal plan".
    c. Perform all cutting and handling of asbestos cement pipe in accordance with the State of California requirements. Provide sufficient supervision and perform monitoring to assure conformance with State requirements. Under no circumstances shall the Contractor utilize methods of removal that result in the release of asbestos fibers into the air.
2. Equipment:
    a. Snap cutting tools shall be used for the removal of asbestos cement pipe whenever the removal of intact pipe sections is not possible.
    b. Power "cut off" saws, hand-saws, and other devices and methods that result in the release of asbestos fibers into the air shall not be used for the removal of ACP.
    c. The pipe shall be wetted prior to the snapping operation being performed.
    d. Use of a hammer and chisel to gradually split an ACP coupling lengthwise may only be performed if the "asbestos cement pipe removal and disposal plan" developed by the Contractor incorporates measures to prevent the release of asbestos fibers into the air and is approved by the Owner.
    e. Encapsulate: If during the removal of ACP broken edges occur, the broken edges shall be encapsulated with Certane 1000 Post Removal Encapsulate or approved equal.
3. Continuously wet the ACP around the snap cutting tool during the removal operation. All personnel handling the ACP shall wear properly fitted respirators during the removal and bagging operations and shall be trained in the use of the respirator equipment. All pedestrian traffic shall be rerouted to maintain 30 feet clear of the removal point. Dispose of liquid and solid waste as follows:
    a. All removed sections or pieces of ACP shall be bagged and prepared for disposal immediately after removal as described below.
    b. Transport and dispose of all sections and pieces of ACP in accordance with State requirements at a legally operating landfill that accepts construction debris. All sections or pieces of ACP shall be wetted and double wrapped or bagged with 6 mil plastic wrap immediately after removal. The outer wrap shall be securely held in place with tape in a manner to prevent the release of airborne asbestos fibers.

H. Perform all related excavation, backfill, and surfacing. Refer to Sections 31 00 00 - Earthwork, 31 23 33 - Trenching and Backfilling, and 32 11 00 - Base Courses.

3.7 SALVAGE

A. Unless directed otherwise by the Owner, all existing items identified for removal shall be hauled off and disposed of by the Contractor in compliance with all State and local ordinances. All costs associated with the disposal of all removed items shall be included within the Contract bid and there will be no separate payment therefor.

3.8 DISPOSAL

A. Dispose of all items removed and not salvaged. Comply with all laws and regulations regarding transport and disposal of waste. Pay all disposal and transport fees.

3.9 RESURFACING

A. Provide temporary or permanent resurfacing, following backfilling, as follows:
   1. Cold-mix asphalt paving may be used for the temporary resurfacing of excavations within paved areas that will have public traffic, and where the paved surface will be removed or replaced under this contract. Cold-mix shall be a minimum of 2-1/2 inches thick and shall be maintained in a smooth condition.
   2. Temporary steel trench plates may be used as specified in Section 31 23 33 - Trenching and Backfilling.
   3. Permanent resurfacing within paved areas shall in accordance with the Plans and as specified in Section 32 12 00 – Flexible Paving.

B. Refer to Section 01 57 13 – Temporary Erosion and Sediment Control for resurfacing requirements in unpaved areas.

**END OF SECTION**

**SECTION 03 30 00**

**CAST-IN-PLACE CONCRETE**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This section modifies Marina Coast Water District (MCWD) Standard Specification 03300, dated November 2007, as required for the complete execution of this Project. Specifications in this Section augment the MCWD Standard Specifications, and/or take precedence over the Standard Specifications where indicated herein.

B. This section describes concrete materials, mixing, placement, form work, reinforcement and curing, for applications such as, but not limited to, thrust blocks and concrete collars.

1.02 REFERENCES

A. ASTM A615 – "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement"

B. ASTM 185 – " Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete"

C. SS PWC – "Standard Specification for Public Works Construction"

1.03 SUBMITTALS:

A. Submittals shall be made in accordance with Part 1, Paragraph C of MCWD Standard Specifications Section 03300, except herein modified:
   1. Submittals shall be formatted and executed in compliance with the requirements of Section 01 33 00 of these Technical Specifications.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Concrete
   1. The methods and equipment used for transporting concrete to the site of Work and the time that elapses during transportation shall not cause segregation of coarse aggregate or slump loss in excess of 1 inch when measured at the point of discharge. Only mixing equipment shall be used to transport concrete on roads or rails.

B. Reinforcing Steel
   1. Deliver reinforcing steel to the site, bundled and tagged with identifying tags

## PART 2 PRODUCTS

2.01 PERFORMANCE/DESIGN CRITERIA

A. Comply with all requirements of MCWD Standard Specifications Section 03300, Part 2, except as modified below:
   1. Modify Part 2, Paragraph A.1 as follows:
      a. All Portland cement concrete shall conform to the provisions of Division 5 of the SS PWC, unless otherwise noted.

## PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Comply with all requirements of MCWD Standard Specifications Section 03300, Part 2, except as modified below:
   1. Modify Part 3, Paragraph H as follows:
      a. Backfill around cast-in-place concrete fill and structures shall be in accordance with Specifications 31 00 00 and 31 23 33 of these Technical Specifications.

**END OF SECTION**

**SECTION 05 05 19**

**POST-INSTALLED CONCRETE ANCHORS**

## PART 1 GENERAL

1.01 DESCRIPTION

A. Section Includes:
   1. Anchors installed in cured or existing concrete or polymer concrete

1.02 REFERENCES

A. ACI 318 “American Concrete Institute: Building Code Requirements for Structural Concrete”

B. ACI 355.2 “American Concrete Institute: Qualification of Post Installed Mechanical Anchors in Concrete and Commentary”

1.03 SUBMITTALS:

A. Provide the following information in the anchorage submittal:
   1. Product data sheet showing the manufacturer, type, material, and dimensions of the anchor and related appurtenances
   2. ICC-ES report
   3. If submitting adhesive anchors, submit the manufacturer's printed instructions for shipping, storing, mixing, and application of proposed adhesives and solvents

## PART 2 PRODUCTS

2.01 GENERAL ANCHORAGE REQUIREMENTS:

A. All anchors shall be Type 316 stainless steel, unless otherwise shown.
   1. All components of stainless-steel concrete anchors shall be compatible.
   2. Stainless steel anchors shall be equipped with appropriate cap screws and washers, or hex nuts and washers as required.
      a. All fasteners and associated hardware shall be Type 316 stainless steel

B. The use of powder-driven anchors will not be permitted.

C. The design of anchors shall be in accordance with ACI 318. Product marking for all hardware shall identify material and ASTM grade.

D. Anchors shall comply with the requirements of the latest edition of the IBC or CBC, ACI-318, and ACI 355.2 in design and performance.

2.02 MECHANICAL ANCHORS:

A. General:
1. Mechanical expansion type anchors will not be permitted in applications that will be subjected to vibrations or impact loads.
2. Mechanical anchors will not be permitted in locations that will be submerged in water, fluids or chemicals.

B. Manufacturers:
1. Hilti: Kwik Bolt TZ
2. Simpson: Strong-Bolt 2, torq-cut anchor
3. Or approved equal

2.03 ADHESIVE ANCHORS:

A. General:
1. Adhesive for anchorage and doweling in hardened concrete shall be 2-component, insensitive to moisture. The Contractor shall use a pre-proportioned adhesive cartridge system or a pre-proportioned adhesive capsule system.
2. Adhesive shall be suitable for the environment within which it is to be installed and shall be fully compatible with the chemical and pH of the fluids in these areas.

B. Manufacturers:
1. Hilti: HIT-HY 200 Adhesive Anchoring System
2. Simpson Strong-Tie: SET-XP High-Strength Epoxy Adhesive
3. Or approved equal

**PART 3 EXECUTION**

3.01 SURFACE PREPARATION

A. Concrete surfaces shall be prepared in accordance with the manufacturer's written recommendations and the requirements of the applicable ICC-ES report.

3.02 INSTALLATION

A. Special Techniques:
1. Concrete anchors shall be installed in accordance with the manufacturer's written recommendations and the requirements of the applicable ICC-ES report.
2. Adhesive anchors shall be installed in concrete having a minimum age of 21 days at the time of anchor installation.

B. Tolerances:
1. Adhesive materials shall be protected from temperature extremes during curing. The temperature of the base materials shall not exceed the range permitted for the adhesive. During hot weather, adhesive anchors shall be shaded to provide uniform curing condition

C. Adhesive anchors shall be installed in such a manner as to ensure:
   1. The adhesive has not exceeded its shelf life at time of use.
   2. The foundation or substrate has been properly prepared, cleaned, saturated, and is protected from contamination per adhesive anchor manufacturer's recommendations.
   3. The set time, curing time, and strength of the adhesive is in accordance with the manufacturer's specifications.
   4. The placing methods specified by the manufacturer are used.
   5. Curing is initiated at the correct time and maintained for the correct time period at the proper temperature
   6. Shims, wedges, or other leveling devices are removed, if required, and necessary repairs are made.
   7. The temperature of the substrate, bonding materials, and air are within the manufacturer's specification limits.
   8. Concrete surfaces beyond the limits of the surface receiving adhesive shall be protected against spillage.
   9. Adhesive applied or spilled beyond desired areas shall be immediately removed. Cleanup shall be performed with material designated by the adhesive manufacturer. Contamination of work areas shall be avoided.

**END OF SECTION**

**SECTION 08 31 13**

**ACCESS DOORS AND FRAMES**

## PART 1 GENERAL

1.01 DESCRIPTION

A. The work shall include providing all materials, labor, and equipment to construct all access doors, frames, and safety grates to new polymer concrete vault, complete as a functional unit.

1.02 REFERENCES

A. ACI 318 “American Concrete Institute: Building Code Requirements for Structural Concrete”

B. ACI 355.2 “American Concrete Institute: Qualification of Post Installed Mechanical Anchors in Concrete and Commentary”

1.03 SUBMITTALS:

A. The following submittals shall be submitted in compliance with the requirements of Section 01 33 00:
   1. Product data sheets for all access lids, frames, safety grates, hardware, and associated appurtenances.
   2. Manufacturer’s certification of lid load rating and that lid meets loading requirements specified herein and in the drawings.
   3. Manufacturer guarantee/warranty information, in compliance with the requirements of Para. 1.04 and 1.05, this Section.
   4. Shop drawing(s) detailing new access door frame tie-in to existing pre-cast lids for wetwells and valve vaults.

1.04 QUALITY ASSURANCE

A. Manufacturer: A minimum of 5 years’ experience manufacturing similar products.

B. Installer: A minimum of 2 years' experience installing similar products.

1.05 WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s standard warranty. Materials shall be free of defects in material and workmanship for a minimum period of three years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge to the District.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-ventilated area.

B. Inspect product upon delivery/receipt and report damaged material(s) immediately to delivering carrier and note such damage on the carrier's freight bill. Owner will not accept damaged material.

C. Replacement or repair of all damaged equipment shall be the responsibility of the Contractor and Vendor, and at no additional cost to the Owner.

**PART 2 PRODUCTS**

2.01 GENERAL REQUIREMENTS:

A. Access door dimensions shown on the Plans are the full opening dimensions.

B.

2.02 ACCESS FRAME AND COVER

A. Construction:
   1. Doors:
      a. Door leaf shall be at least ¼" thick 5086-H34 mill finish aluminum diamond pattern plate non skid exterior surface.
      b. Shall open to 90 degrees and automatically lock.
      c. Shall be single leaf construction.
   2. Frame members shall be ¼" thick 6063-T5 mill finish aluminum extrusion.
   3. Access frame and cover shall be flood-tight.
   4. Load Rating: Minimum 625 lbs per square foot.
   5. Access frame and cover must be lockable.
   6. Hinges, tamper proof attaching hardware, and other ancillary metal hardware shall be 316 stainless steel, unless otherwise noted.
   7. Gasket: Shall be a ¼" thick neoprene compression gasket.
   8. Coatings: Apply coating, per manufacturer's recommendation, between the framing and concrete connection
   9. Aluminum Isolation: Where the access frame and cover as installed in concrete, provide a gasket or other isolator to prevent aluminum-concrete corrosion

B. Manufacturers:
   1. Halliday F1R Hatch, or approved equal.

**PART 3 EXECUTION**

3.01 GENERAL

A. Contractor shall confirm all required dimensions prior to ordering all access doors, frames, and safety grates.

B. Install all products specified herein in accordance with the manufacturer's recommendations.

C. Repair/replace any concrete or polymer concrete that was damaged or removed during the installation of the access doors and frame.

3.02 EXAMINATION

A. Examine substrates and opening for compliance with manufacturer's requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

**END OF SECTION**

**SECTION 09 90 00**

**PAINTING AND COATING**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This section modifies Marina Coast Water District (MCWD) Standard Specification 09900, dated November 2007, as required for the complete execution of this Project. Specifications in this Section augment the MCWD Standard Specifications, and/or take precedence over the Standard Specifications where indicated herein.

B. This section includes the materials and application of painting and coating systems for buried and exposed surfaces.

C. All articles to be painted or coated shall be painted or coated in the place of manufacture, unless otherwise stated in the Plans and/or these Specifications. In the event that the paint or coating is damaged in the field, it will be touched up in the same manner as the original paint or coating applied in the place of manufacture.

1.02 RELATED WORK DESCRIBED ELSEWHERE

A. All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

1.03 SUBMITTALS

A. Provide submittals in accordance with Section 09900, Painting and Coating, of the MCWD Standard Specifications, with the following modifications:
   1. Submit a Paint Plan for all proposed surfaces identifying the following items:
      a. All proposed materials and procedures, including proposed paint systems, names and experience of personnel to perform the work, proposed surface preparation specifications, required physical and environmental conditions to perform the work and proposed test methods and reporting for both factory and field applications.
      b. The plan shall also include proposed maintenance requirements for all surfaces.
   2. Samples of field applied paint and coating finishes, colors, and covering shall also be provided.
   3. The paint plan and all samples shall be provided at least 21 days prior to start of such finishing operations.

1.04 COATINGS

A. All specified materials must meet and comply with National Sanitation Foundation (NSF) and California current air quality regulations governing architectural and industrial coatings.

B. All materials of a specified painting or coating system – including primer, intermediate, and finish coats – shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the manufacturer for the selected painting and/or coating system.

## PART 2 MATERIALS

2.01 PVC PIPE COATING SYSTEMS

A. All PVC pipe coatings systems shall consist of:
   1. Base Coat: Modified Polyamine Epoxy
      a. Dry film thickness: 2.0 – 3.0 mils
      b. Approved Products:
         1) Tnemec Series L69 Epoxy,
         2) Sherwin Williams Macropoxy 646,
         3) PPG/PMC Amerlock 2VOC,
         4) Or approved equal
   2. Finish Coat: Pigmented Aliphatic Acrylic Urethane
      a. Dry film thickness: 2.0 – 4.0 mils
      b. Approved Products:
         1) Tnemec Endura-Shield II Series 1095,
         2) Sherwin Williams Hi-Solids Polyurethane 100 Gloss,
         3) PPG/PMC Amershield VOC Polyurethane,
         4) Or approved equal

B. Surface Preparation:
   1. Prepare surface in compliance with SSPC-SP1 solvent cleaning.
   2. Use medium-grain (120-150 grit) sandpaper to uniformly abrade whole surface to be coated.

## PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Execution of all coating systems shall be performed in accordance with the requirements of MCWD Standard Specification 09900, Part 3, except as modified herein.

3.02 APPLICATION

A. Prepare surface and apply per Paragraph 2.01, this Specification.

B. Do not prepare more surface area than can be coated in one day. Remove all sharp edges, burrs, and weld spatter prior to coating.

3.03 SURFACES NOT TO BE COATED

A. Add the following items to Part 3, Paragraph C of MCWD Standard Specification Section 09900:
   1. Factory-coated pipe, fittings, valves, flow meters, and appurtenances
   2. HDPE pipe and fittings
   3. Polymer concrete structures

**END OF SECTION**

## SECTION 26 05 05
## SELECTIVE DEMOLITION FOR ELECTRICAL

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electrical demolition.

### PART 2 PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

### PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned facilities.

B. Demolition drawings are based on casual field observation and existing record documents.

C. Report discrepancies to Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

### 3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.

1. Obtain permission from District at least 1 week hours before partially or completely disabling system.

### 3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

E. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

F. Repair adjacent construction and finishes damaged during demolition and extension work.

G. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

H. Extend existing installations using materials and methods as specified.

**END OF SECTION**

## SECTION 26 05 19
## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Electrical tape.

D. Wire pulling lubricant.

### 1.02 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2024.

F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

J. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

K. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.

L. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

M. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

N. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

### 1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

### PART 2 PRODUCTS

### 2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

## 2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

H. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      c. 240/120 V, 1 Phase, 3 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Neutral/Grounded: White.
      d. Equipment Ground, All Systems: Green.

## 2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
   1. Copper Building Wire: Type XHHW-2.

## 2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

## 2.05 ACCESSORIES

A. Electrical Tape:
   1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

B. Wire Pulling Lubricant:
   1. Listed and labeled as complying with UL 267.
   2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
   3. Suitable for use at installation temperature.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

## 3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

D. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

E. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

F. Install conductors with a minimum of 12 inches of slack at each outlet.

G. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

H. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

I. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

J. Insulate ends of spare conductors using vinyl insulating electrical tape.

K. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

L. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**END OF SECTION**

## SECTION 26 05 29
## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

### 1.02 REFERENCE STANDARDS

A. MFMA-4 - Metal Framing Standards Publication; 2004.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems and post-installed concrete/masonry anchors.

### PART 2 PRODUCTS

### 2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Comply with the following. Where requirements differ, comply with most stringent.
      a. NFPA 70.
      b. Requirements of authorities having jurisdiction.
   2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
   3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
   4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported with minimum safety factor of _____. Include consideration for vibration, equipment operation, and shock loads where applicable.
   5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   6. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
      a. Indoor Dry Locations: Use 316 stainless steel unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use 316 stainless steel unless otherwise indicated.

B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.

C. Metal Channel/Strut Framing Systems:
   1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
   2. Comply with MFMA-4.
   3. Channel Material:
      a. Indoor Dry Locations: Use 316 stainless steel.
      b. Outdoor and Damp or Wet Indoor Locations: Use 316 stainless steel.
   4. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
   5. Minimum Channel Dimensions: 1-5/8 inch wide by 13/16 inch high.

D. Hanger Rods: Threaded,316 stainless steel unless otherwise indicated.

E. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install hangers and supports in accordance with NECA 1.

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

G. Equipment Support and Attachment:
   1. Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.
   2. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

H. Secure fasteners in accordance with manufacturer's recommended torque settings.

I. Remove temporary supports.

**END OF SECTION**

**SECTION 26 05 33.13**
**CONDUIT FOR ELECTRICAL SYSTEMS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. PVC-coated galvanized steel rigid metal conduit (RMC).

B. Rigid polyvinyl chloride (PVC) conduit.

C. Liquidtight flexible nonmetallic conduit (LFNC).

### 1.02 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 29 - Hangers and Supports for Electrical Systems.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2025.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

D. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit; 2018.

E. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

F. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

I. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

J. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

K. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

L. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.

## PART 2 PRODUCTS

### 2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, PVC-coated galvanized steel rigid conduit.

C. Underground:
   1. Exterior, Direct-Buried: Use rigid PVC conduit.
   2. Where rigid polyvinyl chloride (PVC) conduit is provided, transition to PVC-coated galvanized steel rigid metal conduit (RMC) where emerging from underground.

D. Above Ground: Use PVC-coated galvanized steel rigid metal conduit (RMC).

### 2.02 CONDUIT - GENERAL REQUIREMENTS

A. Comply with NFPA 70.

B. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling mandrel through them.

C. Provide conduit, fittings, supports, and accessories required for complete raceway system.

D. Provide products listed, classified, and labeled as suitable for purpose intended.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

## 2.03 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil, 0.040 inch.

C. Interior Coating: Urethane, minimum thickness of 2 mil, 0.002 inch.

D. PVC-Coated Boxes and Fittings:
   1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
   2. Nonhazardous Locations: Use boxes and fittings listed and labeled as complying with UL 514A, UL 514B, or UL 6.
   3. Material: Use steel or malleable iron.
   4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil, 0.040 inch.
   5. Interior Coating: Urethane, minimum thickness of 2 mil, 0.002 inch.

E. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil, 0.015 inch.

## 2.04 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 80 unless otherwise indicated; rated for use with conductors rated 90 degrees C.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

## 2.05 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

A. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL 1660.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for type of conduit to be connected.

## 2.06 ACCESSORIES

A. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

B. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.

C. Conduit Mechanical Seals:
   1. Listed as complying with UL 514B.
   2. Specifically designed for sealing conduit openings against water, moisture, gases, and dust.
   3. Suitable for sealing around conductors/cables to be installed.

D. Sealing Systems for Concrete Penetrations:

1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install conduit in accordance with NECA 1.

C. PVC-Coated Galvanized Steel Rigid Metal Conduit (RMC): Install using only tools approved by manufacturer.

D. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.

E. Liquidtight Flexible Nonmetallic Conduit (LFNC): Install in accordance with NECA 111.

F. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. Maintain minimum clearance of 6 inches between conduits and piping for other systems.

G. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 26 05 29.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
4. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.

H. Connections and Terminations:
1. Use suitable adapters where required to transition from one type of conduit to another.
2. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
3. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
4. Secure joints and connections to provide mechanical strength and electrical continuity.

I. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

J. Provide grounding and bonding; see Section 26 05 26.

### 3.02 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

### 3.03 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

**END OF SECTION**

**SECTION 26 24 13**
**SWITCHBOARDS**

## PART 1 GENERAL

### 1.01 SUMMARY

A. Metered service entrance switchboard is District (Owner) funished, contractor installed. This specification is for the installation of the switchboard only.

### 1.02 RELATED REQUIREMENTS

A. Section 26 05 29 - Hangers and Supports for Electrical Systems.

### 1.03 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store switchboards in accordance with manufacturer's instructions, NECA 400, and NEMA PB 2.1.

B. Store in a clean, dry space having a uniform temperature to prevent condensation (including outdoor switchboards, which are not weatherproof until completely and properly installed). Where necessary, provide temporary enclosure space heaters or temporary power for permanent factory-installed space heaters.

C. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

D. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

## PART 3 EXECUTION

### 2.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings and configurations of the switchboards and associated components are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive switchboards.

D. Verify that conditions are satisfactory for installation prior to starting work.

### 2.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install switchboards in accordance with NECA 1 (general workmanship), NECA 400, and NEMA PB 2.1.

C. Arrange equipment to provide required clearances and maintenance access, including accommodations for any drawout devices.

D. Where switchboard is indicated to be mounted with inaccessible side against wall, provide minimum clearance of 1/2 inch between switchboard and wall.

E. Provide required support and attachment in accordance with Section 26 05 29.

F. Install switchboards plumb and level.

G. Install all field-installed devices, components, and accessories.

H. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.

I. Provide filler plates to cover unused spaces in switchboards.

### 2.03 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of switchboard covers and doors.

## 2.04 CLEANING

A. Clean dirt and debris from switchboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred surfaces to match original factory finish.

## 2.05 PROTECTION

A. Protect installed switchboards from subsequent construction operations.

**END OF SECTION**

## SECTION 26 29 13
## ENCLOSED CONTROLLERS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Enclosed NEMA controllers for low-voltage (600 V and less) applications:
   1. Magnetic motor starters.

B. Overcurrent protective devices for motor controllers, including overload relays.

C. Control accessories:
   1. Auxiliary contacts.
   2. Pilot devices.
   3. Control and timing relays.
   4. Control power transformers.

### 1.02 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 05 29 - Hangers and Supports for Electrical Systems.

C. Section 26 28 13 - Fuses: Fuses for fusible switches.

### 1.03 REFERENCE STANDARDS

A. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers; 2016.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

D. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

E. NEMA IA 10039 - Control Circuit and Pilot Devices; 2025.

F. NEMA IA 10030 - Industrial Control and Systems: Enclosures; 2024.

G. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

J. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.

K. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for motor controllers, enclosures, overcurrent protective devices, and other installed components and accessories.

C. Shop Drawings: Indicate dimensions, voltage, controller sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

### 1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to internal components, enclosure, and finish.

## 1.07 FIELD CONDITIONS

A. Maintain field conditions within required service conditions during and after installation.

# PART 2 PRODUCTS

## 2.01 ENCLOSED CONTROLLERS

A. Provide enclosed controller assemblies consisting of all required components, control power transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete operating system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Description: Enclosed controllers complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; ratings, configurations and features as indicated on the drawings.

D. Short Circuit Current Rating:
   1. Provide controllers with listed short circuit current rating 22 KAIC.

E. Conductor Terminations: Suitable for use with the conductors to be installed.

F. Enclosures:
   1. Comply with NEMA IA 10030.
   2. Environment Type per NEMA EN 10250: As indicated on the drawings.
   3. Finish: Manufacturer's standard unless otherwise indicated.

G. Instrument Transformers:
   1. Comply with IEEE C57.13.
   2. Select suitable ratio, burden, and accuracy as required for connected devices.
   3. Current Transformers: Connect secondaries to shorting terminal blocks.
   4. Potential Transformers: Include primary and secondary fuses with disconnecting means.

H. Magnetic Motor Starters: Combination type unless otherwise indicated.
   1. Combination Magnetic Motor Starters: NEMA ICS 2, Class A combination motor controllers with magnetic contactor(s), externally operable disconnect and overload relay(s).
   2. Configuration: Full-voltage non-reversing unless otherwise indicated.
   3. Disconnects: Disconnect switch type.
      a. Disconnect Switches: Fusible type unless otherwise indicated.
      b. Provide externally operable handle with means for locking in the OFF position. Provide safety interlock to prevent opening the cover with the disconnect in the ON position with capability of overriding interlock for testing purposes.
      c. Provide auxiliary interlock for disconnection of external control power sources where applicable.
   4. Overload Relays: Bimetallic thermal type unless otherwise indicated.
   5. Pilot Devices Required:
      a. Furnish local pilot devices for each unit as specified below unless otherwise indicated on drawings.
      b. Single-Speed, Non-Reversing Starters:
         1) Pushbuttons: START-STOP.
         2) Selector Switches: HAND/OFF/AUTO.
         3) Indicating Lights: Red ON.
         4) Control Power Indication Light: White

## 2.02 OVERCURRENT PROTECTIVE DEVICES

A. Overload Relays:
   1. Provide overload relays and, where applicable, associated current elements/heaters, selected according to actual installed motor nameplate data, in accordance with manufacturer's recommendations and NFPA 70; include consideration for motor service factor and ambient temperature correction, where applicable.
   2. Inverse-Time Trip Class Rating: Class 20 unless otherwise indicated or required.
   3. Trip-free operation.
   4. Visible trip indication.
   5. Resettable.
      a. Employ manual reset unless otherwise indicated.
      b. Do not employ automatic reset with two-wire control.
   6. Bimetallic Thermal Overload Relays:
      a. Interchangeable current elements/heaters.
      b. Adjustable trip; plus/minus 10 percent of nominal, minimum.
      c. Trip test function.

B. Fusible Disconnect Switches:
   1. Description: Quick-make, quick-break, dead-front fusible switch units complying with NEMA BS 31047, and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated on the drawings.
   2. Fuse Clips: As required to accept indicated fuses.
   3. Provide externally operable handle with means for locking in the OFF position. Provide means for locking switch cover in the closed position. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

## 2.03 CONTROL ACCESSORIES

A. Auxiliary Contacts:
   1. Comply with NEMA IA 10039.
   2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking, plus one normally open (NO) and one normally closed (NC) spare contact for each magnetic motor starter, minimum.

B. Pilot Devices:
   1. Comply with NEMA IA 10039; heavy-duty type.
   2. Pushbuttons: Unless otherwise indicated, provide momentary, non-illuminated type with flush button operator; normally open or normally closed as indicated or as required.
   3. Selector Switches: Unless otherwise indicated, provide maintained, non-illuminated type with knob operator; number of switch positions as indicated or as required.
   4. Indicating Lights: Push-to-test type unless otherwise indicated.
   5. Provide LED lamp source for indicating lights and illuminated devices.

C. Control and Timing Relays:
   1. Comply with NEMA IA 10039.
   2. Provide number and type of relays indicated or required to perform necessary functions.

D. Control Power Transformers:
   1. Size to accommodate burden of contactor coil(s) and all connected auxiliary devices, plus 10 percent spare capacity.
   2. Include primary and secondary fuses.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that ratings of enclosed controllers are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive enclosed controllers.

D. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 INSTALLATION**

A. Install products in accordance with manufacturer's instructions.

B. Install controllers in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 26 05 29.

E. Install enclosed controllers plumb and level.

F. Provide grounding and bonding in accordance with Section 26 05 26.

G. Install all field-installed devices, components, and accessories.

H. Provide fuses complying with Section 26 28 13 for fusible switches as indicated.

I. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.

J. Set field-adjustable controllers and associated components according to installed motor requirements, in accordance with manufacturer's recommendations and NFPA 70.

**3.03 ADJUSTING**

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

**3.04 CLEANING**

A. Clean dirt and debris from controller enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

**3.05 PROTECTION**

A. Protect installed enclosed controllers from subsequent construction operations.

**END OF SECTION**

**SECTION 31 00 01**

**EARTHWORK SPECIAL PROVISIONS**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This section modifies Marina Coast Water District (MCWD) Standard Specification sections 02200 and 02223, dated November 2007, as required for the complete execution of this CIP GW-2404GN, Reservation Road Desalination Plant Renovation Project. Specifications in this Section augment the MCWD standard specifications, and/or take precedence over the standard specifications where indicated herein.

1.02 DEFINITIONS

A. Subgrade: The grading area below a pavement zone, which comprises the asphalt concrete and aggregate base section placed over trench backfill or road section.

1.03 SECTION 02200 – STRUCTURE EARTHWORK:

A. PART 1 – GENERAL
   1. Paragraph 1.C refers to the compaction testing requirements of MCWD Standard Specificaton Section 02223, Trenching, Backfilling, and Compacting. Note that this specification is augmented by the requirements outlined in Paragraph 1.03 of this Specification.
   2. Add the following to Paragraph 1.F:
      a. Contractor shall provide to the Owner, for review and approval, a detailed Well Access Plan. The Well Access Plan shall identify, at a minimum, the following items:
         1) Material, dimensions, and rated load bearing capacity of access mats.
         2) Proposed alignment and width of access road and well workover pad.
         3) Calculations showing selected matting is rated for all equipment used to access the well and perform all work at the well site.

B. PART 2 – MATERIALS
   1. Add the following to Paragraph 2:
      a. All equipment access matting shall be made from wood or HDPE composite materials.
         1) Approved wood materials include hardwood, Douglas Fir, and Southern Yellow Pine.

C. PART 3 – EXECUTION
   1. Add the following to Paragraph 3.E.1:
      a. The stipulations of this paragraph shall not apply to scarification areas identified in the Plans.
   2. Add new Paragraph 3.J – <u>Earthwork Maintenance</u>:

a. The Contractor shall be responsible for all maintenance related to the earthwork operations, both on and offsite. The contractor shall maintain all areas clean of dust, mud and debris, and shall control erosion during the earthwork operations

b. Street Cleaning: The Contractor shall exercise care in the use of public and private roads and shall repair at his own expense any damage thereto caused by his operations. Such repair shall be to the satisfaction of the owner or agency having jurisdiction over the road. The Contractor shall take whatever means are necessary to prevent tracking mud onto existing roads and shall keep roads free of debris. The Contractor shall utilize street cleaning machines as necessary to maintain the streets free of dirt and debris from its operations at all times.

c. Dust Control: Take proper and efficient steps to control dust. Contractor to supply water for dust control.

d. Storage of Materials: Neatly place excavated materials far enough from the excavation to prevent stability problems. Keep the materials shaped so as to cause the least possible interference with drainage. Provide all such erosion control measures as are required to prevent loss of material or damage to property. The cost of maintaining and protecting stockpiled materials shall be considered to be included in the price paid for excavating, filling, or furnishing the materials, and there will be no separate payment allowed, therefore.

e. Existing Facilities: Maintain access to existing facilities to permit continued operation as required by the Owner. Maintain access for fire fighting equipment and to fire hydrants.

f. Finished Condition: Grades shall be maintained in a finished condition and true to grade until acceptance of the Contract as complete.

3. Add new Paragraph 3.K – Clearing and Grubbing

a. Protect existing trees, native shrubs, and environmentally sensitive areas designated to remain by placing orange ESA fencing at the drip line or as shown on the drawings prior to any clearing and grubbing or other earthwork.

b. Voids created by the above removals shall be filled and recompacted with the material and to the requirements of the area in question.

c. Properly dispose of all removed objectionable material, including all organic material. Organic material shall be disposed of at a proper waste disposal facility.

4. Add new Paragraph 3.L – Excavation (Cut)

a. The Contractor shall perform all construction excavation, including hand digging, shoring, de-watering, asphaltic concrete removal, concrete removal, and grading necessary or required for the construction of the Work as covered by these Specifications and indicated on the Drawings. The excavation shall include, without classification, the removal and disposal of all materials of whatever nature encountered, including water

and all other obstructions that would interfere with the proper construction and completion of the required work.

b. Barriers: Barriers shall be placed around all excavations and at such places as may be necessary to warn all pedestrian and vehicular traffic of such excavations.

c. Sawcutting Pavement: Where trenching or excavation occurs in paved areas to remain, the pavement shall be saw-cut and broken ahead of the trenching or excavation operation. The extent of paving removed shall be limited to the minimum necessary for the excavation. However, the sawcut limits shall be extended for the following reasons:
   1) To form neat, straight and square lines.
   2) To include areas of pavement damaged by Contractor.
   3) To allow for sloped trench walls.

d. Slopes: Finished cut slopes shall not exceed the steepness shown on the plans. If no steepness is designated, the maximum slope shall be 2 horizontal to 1 vertical.

e. Unless otherwise specified, cut pads shall be scarified to a minimum depth of 12 inches, moisture conditioned, and recompacted to the minimum requirements established in this Specification.

5. Add new Paragraph 3.M – Excavation (Fill)

a. The Contractor shall perform all construction embankment and filling including shoring, de-watering, backfilling, structural fill, non-structural fill, sand and aggregate bases, compaction and grading necessary or required for the construction of the Work as covered by these Specifications and indicated on the Drawings. Embankment (fill), shall include, without classification, the preparation, placement, compaction and finishing of all earth materials to the lines and grades prescribed by the Contract Documents.

b. Scarification: Areas to receive fill shall be prepared by clearing and grubbing, and scarifying to a minimum depth of 12 inches, moisture conditioning and recompacting to the minimum relative compaction specified for the fill to be placed above.
   1) Voids created by dislodging cobbles and/or debris during scarification shall be backfilled and recompacted, and the dislodged materials shall be removed from the work area.
   2) Obtain approval from the Engineer prior to placing fill on a prepared foundation.
   3) Scarification operation shall be performed at locations designated for proposed structural fill, slabs on-grade, exterior flatwork, foundations, and pavement areas.

c. General fill and backfill soils shall be placed in level lifts not exceeding 8 inches in loose thickness, moisture conditioned and compacted. All materials used as fill shall be cleaned of all organic material, debris, and any rocks larger than 3 inches in diameter. When fill material contains rocks, the rocks shall be placed in a sufficient soils matrix to ensure that

voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

d. Benching: Fill slopes that are 25 percent (4 to 1) or steeper, shall have a foundation prepared by bench at the toe of slope. The bench shall be constructed as shown on the plans, or if not shown, by excavating a 2-feet deep by 10-feet wide level bench along the toe of slope. The bottom of the bench shall be scarified and backfilled as specified in this section for fill.

e. Moisture Content: At the time of compaction, the moisture content of fill materials shall be such that the specified relative compaction will be obtained, and the fill will be in a firm and stable condition. Fill material which contains excessive moisture shall not be compacted until the material is dry enough to obtain the required compaction. Full compensation for any additional work involved in drying fill material to the required moisture content shall be considered included in the contract price paid for excavating or furnishing the material and no additional compensation will be allowed, therefor.

f. Compaction: Compaction efforts, unless otherwise shown on the Plans, shall comply with MCWD District Standard Specification 02223.

g. Slopes: Finished fill slopes shall not exceed the steepness shown on the plans. If no steepness is designated, the maximum slope shall be 2 horizontal to 1 vertical.

6. Add new Paragraph 3.N – Site Drainage and Finish Improvements

   a. Unless otherwise specified, unpaved ground surfaces shall be finished graded to direct surface runoff away from site improvements at a minimum 5% grade for a minimum distance of 10 feet.

      1) If finish grading cannot be performed as described above, swales with improved surfaces should be provided to divert drainage away from improvements.

7. Add new Paragraph 3.O – Exterior Flatwork

   a. Exterior concrete flatwork shall have a minimum thickness of 4 inches and should be reinforced as necessary per the Plans.

   b. All exterior concrete flatwork shall have a 4 inch (minimum) thick underlayer of Class 2 aggregate base conforming to Section 26-1.02B of the Caltrans Standard Specifications. Aggregate base shall be compacted as specified herein.

8. Add new Paragraph 3.P – Unsuitable Soil

   a. Unsuitable soil is soil that, due to its nature, cannot be properly compacted to or is yielding and cannot provide support for the overlying structural section.

   b. A condition of soil moisture exceeding optimum moisture content to a degree that causes yielding or prevents proper compaction shall **not** be cause to consider soil as unsuitable.

c. The Engineer shall determine whether soil shall be considered unsuitable. If the soil is determined to be unsuitable, the Engineer may direct the Contractor to follow an alternative method of construction to provide additional support. Such alternative measures will be paid for as extra work.

d. Wet Soil: If wet soils are encountered, the Contractor shall take such measures as are required to dry the soil to a degree that it can be compacted and form a firm and unyielding surface. These measures shall be included in the bid items requiring such compaction and there shall be no separate payment, therefore.

9. Add new Paragraph 3.Q – Disposal of Excavated Material

a. Use as trench backfill: Refer to the requirements of Paragraph 1.04 of Sectin 31 00 01 of the Technical Specifications and MCWD Standard Specification Section 02223.

b. Export: Where excavated will not be reused onsite, the Contractor shall haul the material away. The Contractor is responsible for determining the nature of the material to be exported, for the proper location to deliver the material to, for obtaining all permits and processing, and for the proper placement and handling of the material at the offsite location, all as part of the Work at not additional cost to Owner.

10. Add new Paragraph 3.R – Equipment Access Pads

a. Contractor to identify matting solutions, including matting materials, dimensions, and load-bearing capacity, as part of the Well Access Plan, to be submitted to the Owner for review and approval.

b. Installation:

1) Install matting on top of prepared subgrades as necessary and in accordance with manufacturer's recommendations.

2) All fasteners shall be countersunk to provide a smooth snag-free surface.

D. Erosion control shall be as shown on the drawings and as specified in Section 01 57 13, Temporary Erosion and Sediment Control, of these Technical Specifications.

1.04 SECTION 02223:

A. PART 1 – GENERAL

1. Modify Paragraph 1.C.7 as follows: The Owner or Owner's Representative will secure the service of a qualified soils engineering firm to perform compaction testing and pay the cost of initial testing. The Contractor shall be responsible for the cost of all retest in failed areas. Test results will be furnished by the District representative.

2. Add the following to Paragraph 1.J.2: Lighting at excavations may be omitted upon written approval from the Owner, and after the Contractor has proved to the satisfaction of the Owner or Owner's Representative that the Contractor has placed mitigative measures to prevent risks to pedestrians and vehicular traffic.

a. Mitigative measures include steel trench plates either spiked in place or secured with temporary AC pavement around all edges or security fence installed completely around the excavation.
b. Contractor to provide detailed account of all mitigation measures in the Construction Work Plan submitted to Owner for review and approval.

B. PART 2 – MATERIALS
1. Modify Paragraph 2.A.3 as follows:
a. Native earth backfill shall not be used in the pipe zone, except for clean native sand fill excavated from the State Beach property for the portions of the utility trenches installed in the State Beach property, as shown in the Plans.
1) Contractor shall remove all deleterious materials and obstructions that would interfere with the proper compaction of the native sand fill and completion of the required work.
2. Add a new Paragraph 2.G:
a. Class 2 Base: 3/4” minus, per Caltrans Standard Specification 26.

C. PART 3 – EXECUTION
1. Modify Paragraph 3.A.1 as follows:
a. The Owner or Owner’s Representative will secure the service of a qualified soils engineering firm to perform compaction testing and pay the cost of initial testing. The Contractor shall be responsible for the cost of all retest in failed areas. Test results will be furnished by the District representative.

**END OF SECTION**

## SECTION 32 11 23

## AGGREGATE BASE COURSES

### PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Aggregate Base Courses

1.02 SUBMITTALS

A. Submit the following:
   1. Material total value and product data for products having recycled content.
   2. Material total value and product data for products extracted or harvested AND manufactured within 500 miles of the Project.
   3. Provide testing results demonstrating conformance to the requirements of this Section and the District City Standards.

### PART 2 PRODUCTS

2.01 AGGREGATE BASE COURSES

A. In accordance with Para. 2.01.H, Section 31 00 00 – Earthwork.

B. No materials shall be delivered to the site that are not in conformance with these Technical Specifications, or unless accepted by the Engineer in writing.

### PART 3 EXECUTION

3.01 GENERAL

A. Aggregate base course shall be placed using the means and methods described in Section 31 00 00 – Earthwork, and Section 31 23 00 – Trenching and Backfill.

B. Layer thickness of new aggregate base course shall meet existing layer thickness, or minimum layer thickness specified on the trench details, whichever is greater.

3.02 TESTING

A. Refer to Para. 3.08, Section 31 00 00 – Earthwork.

**END OF SECTION**

**SECTION 32 12 00**

**FLEXIBLE PAVING**

## PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Asphaltic concrete (AC) paving.
   2. Aggregate or other base course.
   3. Surface sealer.
   4. Aggregate subbase course.
   5. Grinding (cold plane) AC paving.

1.02 REFERENCES

A. Caltrans Standard Specifications, 2025, as published by the California Department of Transportation.

B. Caltrans Standard Plans, 2025, as Published by Caltrans, including amendments effective prior to bid opening.

1.03 SUBMITTALS

A. Product Data:
   1. AC Mix Design.
   2. Delivery certifications (load slips) indicating the specification and tonnage for all AC pavement delivered to the site.
   3. Delivery certifications (load slips) indicating the specification and tonnage for all base materials delivered to the site.

B. Material Samples:
   1. AC Samples for testing.
   2. Base material samples for testing.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Conform to the requirements of the California Air Resources Board (CARB) and the local Air Pollution Control District.

## PART 2 - PRODUCTS

2.01 MATERIALS

A. Aggregate Base: Refer to Section 32 11 23 – Base Courses, these Specifications.

B. Asphalt Concrete: Per Section 39, “Asphalt Concrete”, of the Caltrans Standard Specifications and in accordance with the following:
   1. Asphalt for roads and driveways:
      a. Type A HMA, ¾”.

b. The viscosity grade of the paving asphalt shall be PG 64-10 for all asphalt unless otherwise stated.

C. If the finished surface of the asphalt concrete on the traffic lanes does not meet the specified surface tolerances, it shall be brought within tolerance by either (1) abrasive grinding (with fog seal coat on the areas which have been ground), (2) removal and replacement, or (3) placing an overlay of asphalt concrete a minimum of 2.5 inches thick. The method will be selected by the Engineer. The corrective work shall be at the Contractor's expense.

D. If abrasive grinding is used to bring the finished surface to specified surface tolerances, additional grinding shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at a constant offset from, and parallel to the nearest lane line or pavement edge, and in each longitudinal direction so that the grinding begins and ends at lines normal to the pavement centerline, within any ground area. All ground areas shall be neat rectangular areas of uniform surface appearance. Abrasive grinding shall conform to the requirements in Section 42-3.03, "Construction", of the Caltrans 2023 Standard Specifications.

E. Paint Binder: Paint Binder (Tack Coats), if required, shall conform to Section 39, "Asphalt Concrete", Section 94, "Asphaltic Emulsions", of the Caltrans 2025 Standard Specifications and the following:
1. Paint Binder shall be asphaltic emulsion Type SS-1h.

F. If the paving asphalt percentages are not within the limits specified, and/or the viscosity is not the grade specified, the asphalt concrete shall be removed unless the Owner determines that said asphalt concrete is structurally adequate and may remain in place.

## PART 3 - EXECUTION

3.01 CALTRANS SPECIFICATION

A. All execution shall be per Caltrans Section 39, except as herein specified. Ambient, surface, and mix temperatures shall be per Caltrans Section 39 Construction requirements for Type A HMA. Compaction shall be no less than 91.0% and no more than 97.0% of maximum theoretical density per California Test 375; however, correlation of a gage may be made with only 5 cores with the approval of the Engineer.

3.02 SUBGRADE PREPARATION

A. Refer to Section 31 00 00 – Earthwork.

3.03 AGGREGATE BASE

A. Refer to Section 32 11 33 – Base Courses.

3.04 PLACING ASPHALT CONCRETE PAVEMENT

A. The Contractor shall place the pavement as shown on the Plans, in kind, matching existing lines and grades per pre-construction conditions. Pavement shall be placed in maximum lifts of 2 inch loose thickness. Unless shown otherwise, the street crown

shall provide a minimum 2 percent slope from the centerline toward the road shoulders/edges.

B. Existing manhole rims, valve lids, vaults and all other structures within the area to be paved shall be adjusted as required to fit the new pavement, and new concrete collars shall be provided.

C. A drop-off of more than 0.15 foot will not be allowed at any time between adjacent lanes open to public traffic.

D. Where pavement reconstruction is to occur, permanent trench resurfacing shall not be performed as a separate effort. Permanent trench resurfacing shall be performed as a part of the overall pavement reconstruction effort so that the structural section and appearance is uniform.

E. Asphalt paving includes adjusting the frames and covers of all manholes, valves, monument wells, etcetera, with new concrete rings to the final paving grade. The cost for raising frames and covers to grade shall be included in the amount for asphalt concrete paving, and there shall be no separate payment, therefore.

3.05 TOLERANCES

A. Pavement thickness of new asphalt pavement shall meet existing pavement thickness, or minimum pavement thickness specified on the trench details, whichever is greater. Pavement surface tolerances shall allow new paving to be up to 0.01' higher than downslope adjacent paving, and up to 0.01' lower than upslope adjacent paving when conforming to existing pavement.

B. If the finished surface of the asphalt concrete on the street pavement does not meet the specified surface quality or tolerances, it shall be brought within tolerance by either (1) abrasive grinding, (2) removal and replacement, or (3) placing a 2.5" minimum thick overlay of asphalt concrete. The method will be selected by and will be the option of the Engineer. The corrective work shall be at the Contractor's expense.

C. If abrasive grinding, or removal and replacement, is used to bring the finished surface to specified surface tolerances, additional grinding or removal shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at the nearest traffic lane line or pavement edge, and in each longitudinal direction so that the grinding or removal begins and ends at lines perpendicular to the traffic lane line, within any ground area. All ground areas shall be neat rectangular areas of uniform surface appearance. Abrasive grinding shall conform to the requirements in the first paragraph and the last 4 paragraphs in Section 42-2.03 "Construction," of the Standard Specifications.

D. Milled surface shall be swept clean and tack coat (SS-1h) shall be applied at a rate of 0.1 Gal/SY. This rate shall be adjusted as necessary for proper coverage.

**END OF SECTION**

## SECTION 32 17 23

## PAVEMENT MARKINGS

### PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Traffic stripes and pavement markings.

1.02 REFERENCES

A. Caltrans Standard Specifications, which shall reference the 2025 version, unless otherwise specified, as published by the California Department of Transportation.

B. Caltrans Standard Plans, which shall reference the 2025 version, unless otherwise specified as published by the California Department of Transportation, including amendments effective prior to bid opening.

1.03 SUBMITTALS

A. Submit the following:

1. Per Caltrans Standard Specifications, Section 84, except as noted herein.

### PART 2 PRODUCTS

2.01 PAVEMENT STRIPING AND MARKINGS

A. In accordance with Caltrans Standard Specifications, Section 84, except as noted herein:

1. Unless otherwise shown or specified, all pavement markings shall be thermoplastic in accordance with Caltrans Standard Specification 84-2.02C

B. No materials shall be delivered to the site that are not in conformance with these specifications, or unless accepted by the engineer in writing.

### PART 3 EXECUTION

3.01 GENERAL

A. In accordance with Caltrans Standard Specifications, Section 84, except as noted herein.

**END OF SECTION**

**SECTION 33 01 10.53**

**FLUSHING OF WATER UTILITY PIPING SYSTEMS**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the flushing of water piping, in accordance with the requirements of the latest edition of AWWA C651 and this Section.

1.02 SUBMITTALS

A. The Contractor shall submit a flushing plan, which shall identify all equipment, materials, and procedures utilized for accomplishing flushing of the desalination piping systems, including the source of the potable water used for flushing, point of connection to the piping, discharge point, and management of flush water. Such plan shall be submitted a minimum of 14 days prior to implementation to allow review and approval by Owner.

1. There is an existing fire hydrant owned by the Owner near the existing plant, as identified on the plans. Contractor shall coordinate with Owner for utilizing the hydrant for flushing.

1.03 JOB CONDITIONS

A. Discharge of flush water into watercourses or surface waters is not allowed at any time.

B. Use available potable water for flushing.

C. Submit requests for use of water from the District a minimum of 3 working days in advance.

## PART 2 - PRODUCTS

2.01 NOT USED

## PART 3 – EXECUTION

3.01 GENERAL CONDITIONS

A. Contractor shall submit to Owner and Engineer, for review and approval, a flushing plan per Paragraph 1.02.A of this Section. Plan shall include, at a minimum, the following information:

1. Equipment and materials used to perform flushing in compliance with the minimum requirements identified in Paragraph 3.01.B.

2. Calculation of flushing duration in compliance with Paragraph 3.01.B.3.

3. Source of potable water and point of connection to potable water supply.

4. Handling and disposal of flush water and solids.

B. Minimum requirements:

1. Flushing velocity: 3.0 fps
2. Residual pressure in pipes during flushing: 40psi
3. Duration: flushing shall be performed on a continuous basis for the time necessary to pass a volume of potable water through the entire pipeline that is equal to at least five (5) times the internal volume of the pipeline.

C. Contractor shall furnish and install a suitable backflow prevention device on the connection to the existing potable water supply to prevent any cross-contamination to the existing potable water system.

D. Payment for flushing the complete well intake and brine discharge/injection well piping systems, shall be included in the contract unit price paid for those contract items that require such work and there shall be no separate payment therefor.

**END OF SECTION**

**SECTION 33 01 10.58**

**DISINFECTION OF WATER UTILITY PIPING SYSTEMS**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the disinfection of intake well and discharge/injection well piping and appurtenant piping by chlorination, in accordance with the latest editions of AWWA C651, AWWA C652, and this Section.

1.02 SUBMITTALS

A. The Contractor shall submit a disinfection plan, including a description of how the specified piping disinfection method will be employed. The disinfection plan shall describe how the intake well and brine discharge/injection well piping will be disinfected. Such plan shall be submitted a minimum of 14 days prior to implementation to allow review and approval by Owner.

1.03 JOB CONDITIONS

A. Discharge of chlorinated water into watercourses or surface waters is not allowed at any time.

B. Use available potable water for chlorination. There is an existing fire hydrant owned and operated by the Owner near the existing desalination plant as shown in the Plans. Contractor to coordinate with Owner regarding access to and utilization of this fire hydrant as a source of potable water for construction purposes.

C. Submit requests for use of water from the District a minimum of 3 working days in advance.

## PART 2 - PRODUCTS

2.01 LIQUID CHLORINE SOLUTION (GAS INJECTION)

A. Liquid chlorine solution shall be in accordance with the requirements of ANSI/AWWA B301 and AWWA C651, Section 4.1.1. Although this is an allowable form of chlorination per AWWA 652, this method shall not be used for this disinfection due to inherent safety risk with chlorine gas and the proximity of public property to the site.

2.02 SODIUM HYPOCHLORITE (SOLUTION)

A. Sodium Hypochlorite shall be in accordance with the requirements of ANSI/AWWA B300, and AWWA C651, Section 4.1.2. Dilute it in potable water to desired concentration and pump it into the pipeline at a measured rate.

2.03 CALCIUM HYPOCHLORITE (DRY)

A. Calcium Hypochlorite shall be in accordance with the requirements of ANSI/AWWA B300, and AWWA C651, Section 4.1.3 Dissolve it in potable water to a known concentration in a container and pump it into the pipeline at a measured rate.

2.04 CHLORINE RESIDUAL TEST KIT

A. For measuring chlorine concentration, use a medium range, drop count, titration kit or an orthotolidine indicator comparator with wide range color discs. The kit shall be capable of determining chlorine concentration in the range 1.0 to 25 mg/L. Test kits shall be Hach Chemical, Hellige, or approved equal. Maintain an adequate number of kits in good working order and available for immediate test of residuals at points of sampling.

**PART 3 – EXECUTION**

3.01 WATER MAINS

A. Contractor shall chlorinate all installed intake and discharge/injection well piping per AWWA C651, Section 4.4, Continuous-Feed Method, with the following clarifications:

1. Contractor shall wait a minimum 48 hours after chlorine flushing before collecting sample.

3.01 All bacteriological testing will be performed by a certified laboratory under separate contract by Owner. Contractor shall pay for all failed tests and shall re-disinfect the failed pipelines until passing test results are achieved.

3.02 Payment for disinfecting the intake well and injection/discharge well piping shall be included in the contract unit price paid for those contract items that require such work and there shall be no separate payment, therefor.

**END OF SECTION**

## SECTION 33 01 10.91

## REHABILITATION OF GROUNDWATER WELLS

### PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section covers the Work and all necessary labor, materials, accessories, equipment, and supervision to rehabilitate the existing seawater intake, brine discharge/injection wells, and the three existing monitoring wells as shown in the Plans and described in these Project Technical Specifications. The Work includes cleaning and treatment of the well screens, removal of accumulated sediment and debris, disposal of sediment and debris, zone pumping/development, disposal of development water, and specific capacity testing, and all other work to make the well rehabilitations complete and functional as specified.

B. The work identified in this Section is included as an alternate Bid Item. Should the Owner elect to include this work into the Contract, the work shall be performed in accordance with the Contract Documents, including the Plans, these Technical Specifications, and all referenced District and State standard specifications.

C. The Well Rehabilitation Plan, prepared by Cleath-Harris Geologists (hereinafter referred to as Well Technical Specifications), is included at the end of this Section and all of the requirements contained therein shall be part of these Contract Documents, unless otherwise modified by this Section.

1.02 MODIFICATIONS AND CLARIFICATIONS TO THE WELL TECHNICAL SPECIFICATIONS

A. Disposal of Development and Capacity Test Water: As part of the Construction Work Plan, Contractor shall describe all labor, equipment, materials, and procedures for disposal of all well water pumped during the well rehabilitation tasks outlined in the Well Technical Specifications. This shall include the calculated volume of water pumped from the wells for the rehabilitation tasks and the proposed disposal location of the well water.

B. Potential disposal locations and methods include, but are not limited to, the following:
   1. Water may be discharged into the existing clarifiers located on the Owner's property.
      a. If disposed water within the clarifier has not percolated/evaporated after 14 calendar days, and all rehabilitation tasks for the discharge well are completed, then the Contractor shall pump remaining standing water into rehabilitated discharge well.
         1) Contractor shall provide sump pump, hoses, and all necessary equipment for disposal to discharge well.
         2) Sump pump inlet hose or nozzle shall be fitted with a fine mesh screen, minimum 100 mesh, to prevent sediment and debris from being pumped into the discharge well.

2. A temporary percolation basin may be established on Owner property at the existing desalination plant. Final location of the basin shall be proposed by the Contractor and approved by the Owner or Owner's Representative. Minimum requirements for the temporary percolation basin include:
    a. Minimum basin infiltrative area: 6,000 SF
        1) Minimum basin infiltrative area is defined as the area of the bottom of the pond.
    b. Minimum basin depth: 5 ft
        1) Basin depth shall provide a minimum 2 ft of freeboard from the maximum water surface level to the top of the bank.
    c. Basin is removed and surface is restored to existing grade upon substantial completion of the Project.
3. Contractor may elect to dispose of all well rehabilitation water at a proper offsite disposal facility. The Contractor shall obtain all necessary haul route permits from the agency(s) having jurisdiction.

C. Contractor is not allowed to discharge well rehabilitation water to surface water(s) at any time.

D. As part of the Construction Work Plan, Contractor shall identify locations for placement of all well rehabilitation equipment, including mixing tank, booster pump, storage tanks, and temporary piping/valving. Construction Work Plan shall identify how all well rehabilitation materials and equipment will be secured and stored when not in use.

E. Public access to the Marina State Beach shall be preserved during all well rehabilitation efforts. Public access points shall be coordinated with State Parks to minimize pedestrian and vehicular access to the Contractor's work area(s) located on State Park property.

## PART 2 - PRODUCTS

2.01 PRODUCTS

A. See Well Technical Specifications.

## PART 3 - EXECUTION

3.01 GENERAL

A. See Well Technical Specifications.

B. Refer to Division 01 Technical Specifications for property access, notification requirements, and construction scheduling/coordination requirements.

**END OF SECTION**

(CHG Well Rehabilitation Plan, 12 pages follow)

**SCOPE OF WORK**
**MARINA DESALINIZATION WELL REHABILITATION PROJECT**
**WALLACE GROUP**

## Background

The Marina Coast Water District (MCWD) constructed a coastal desalinization plant at the west end of Reservation Road in 1997. This plant included an intake well, a disposal well, five monitoring wells, and an associated desalinization plant (Figure 1). Since the early 2000's, the plant has largely been on standby, and the plant has reached a state where it is no longer operational. During this time well infrastructure has also decayed. By 2007, coastal erosion had reached the intake well casing and the vault has been exposed in the bluff faces, making the intake well non-operational. Since then, the bluff face has eroded past the location of the intake well. In an effort to stabilize and save the well and improve safety, the district removed the uppermost portion of the well and placing a a bolt-on flange cover on the new top of casing. This flange now sits approximately five feet below the beach surface. The discharge well has suffered from a poor and degraded cap which has led to it being filled with sand and human debris (bottles, cans, ect). The closest three monitoring wells also have suffered damage to the wellheads and have significant sand infilling. Following the 2007 work on the intake well, the wells have only been opened for periodic inspections and water quality testing as part of ongoing monitoring of basin and site conditions.

As part of an effort to increase the resilience of the water supply, the MCWD had contracted with Wallace Group to rehabilitate the coastal desalinization plant and bring it back into production. This effort requires functioning intake, disposal and monitoring wells. As such, Cleath-Harris Geologists (CHG) has been contracted to provide hydrogeologic consulting services related to the rehabilitation of well-related infrastructure. This workplan provides an outline of the tasks required to rehabilitate the wells ahead of plant repair and recommissioning.




0 70 140 ft

N

Basemaps:
Google Satellite (2025)
Coordinate System:
State Plane Zone V, ft - NAD83

Explanation
- Well Sites
- Fence Lines
- Reservation Road

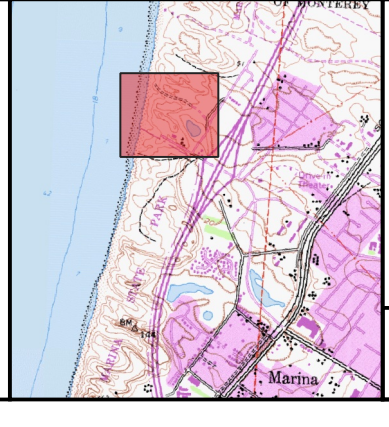



Figure 1

Well Site Map
Reservation Road
Desal Rehab Design

Marina, CA

**CLEATH-HARRIS GEOLOGISTS**

**Scope of Work**

The scope of work for this project includes the rehabilitation of the intake well, the discharge well, and monitoring wells DM-1, MW-2, AND MW-3 (Figure 1). This scope of work includes the following phases and tasks.

***PHASE 1 – MOBILIZATION/DEMOBILIZATION***

Task 1.1 – Mobilization/Demobilization and Site Safety Plan. The contractor shall mobilize and demobilize equipment needed for project; including workover rig, bailers, dispersant/swab tool, jetting tool, zone pump tool, mixing tank, booster pump, storage tanks (two, approximate 21,000-gallon tanks), and temporary piping/valving. A site-specific safety plan shall be prepared by the Contractor for Contactor use that addresses the chemical and physical hazards associated with the project. Note that at the end of each work day and for each phase of the workplan the wellsite and wellhead should be secured to prevent public access.

***PHASE 2: MONITORING WELLS REHABILITATION (DM-1, MW-2, AND MW-3)***

The monitoring wellhead repair and rehabilitation phase (Phase 2) involves repair and upgrades to the existing wellheads (DM-1, MW-2, and MW-3) to allow for their utilization as monitoring wells. This must be the first process completed in order to provide monitoring capacity during the discharge well pumping and discharge tests. Available data regarding the construction and design of monitoring wells DM-1, MW-2 and MW-3 is included in appendices A, B, and C.

***PHASE 2A – MONITORING WELL DMW-1***

Task 2.1 – Rig-Up. Uncover wellheads. Move the work rig to the wellhead and set up. Ensure temporary fencing is in place to keep the public from the work area. Position equipment to allow for the workover of wells DM-1, MW-2, and MW-3. The two temporary storage tanks should be positioned to also allow for use in Phase 3.

Task 2.2- Fluid Management. Fluid management involves collection, storage, and transport of fluids from the wellheads being rehabilitated to designated disposal areas. This requires adequate on-site tanks for fluid storage, neutralization and settling of produced water Anticipated tank storage would consist of two 21,000-gallon tanks (mobilization costs included in Task 1). The two clarification ponds (Figure 1) lie with the historic treatment facility. These ponds have a storage capacity of approximately 500,000 gallons each and are not currently used. However, they have historically been utilized as discharge/percolation ponds during pumping tests and will serve as a discharge point for

fluids produced in Phases 2 and 3. The temporary storage tanks shall be connected in series, baffled or otherwise configured to facilitate the settlement of solids from the produced water. Discharge water that has been allowed to settle will be pumped from the tanks using a booster pump into the clarification ponds for percolation; this discharged water must be at or under 50 Nephelometric Turbidity Units (NTU) before this discharge can occur. Discharged water will be tested and documented for conformance to turbidity standards every 5 minutes during discharge. This will require a temporary pipeline and booster pump to move the water from the tanks to the clarification ponds. Total pipe length needed for fluid management in Phase 2 and 3 is approximately 300 feet. A fluid capacity of up to 600 gallons per minute will be needed in Phase 2 and 3. Each monitoring well is anticipated to produce a total of 10,000 gallons or less during the rehabilitation process (30,000 gallons or less produced in Phase 2). Phases 2 and 3 will lie largely within the same site footprint so some overlap in setup may help optimize the overall workflow. Documentation of discharge water turbidity shall be maintained by the contractor and submitted at the completion of the well rehabilitation.

Task 2.3 – Remove Fill/Debris Monitoring Well. Use air-lift pump to remove fill from the bottom of the well. Sound bottom of well before and after clean out to determine how much, if any, sediment remains in the well.

Task 2.4- Surge and Bail - Monitoring Wells. Surge and bail well for two hours. The estimated pumping rate is anticipated to be approximately 20 gpm. Repeat Task 2.3 if necessary.

Task 2.5 – Repair Wellhead. Excavate as needed to replace broken/degraded casing near the well head. Reinstall new locking sealed well caps on each of the wells. Install a new traffic rated flush mounted box for each monitoring well.

## ***PHASE 2B – MONITORING WELL MW-2***

The wellhead repair and rework phase involves repair and upgrades to the existing MW-2 wellhead to allow for utilization as monitoring well.

Task 2.6 – Remove Fill/Debris Monitoring Well. Use a bailer or air-lift pump to remove fill from the bottom of the well. Sound bottom of well before and after clean out to determine if sediment cleanout has been complete.

Task 2.7- Surge and Bail - monitoring wells. Surge and bail well for two hours. The estimated pumping rate is anticipated to be approximately 20 gpm. Repeat Task 2.6 if necessary.

Task 2.8 – Repair Wellhead. Excavate as needed to replace broken/degraded casing near the well head. Reinstall new locking sealed well caps on each of the wells. Install a traffic rated flush mounted box for each monitoring well.
.

***PHASE 2C – MONITORING WELL MW-3***

The wellhead repair/rework phase involves repair and upgrades to the existing wellhead to allow for utilization as monitoring well.

Task 2.9 – Remove Fill/Debris Monitoring Well. Use a bailer or air-lift pump to remove fill from the bottom of the well. Sound bottom of well before and after clean out.

Task 2.10- Surge and Bail - monitoring wells. Surge and bail well for two hours. Repeat Task 2.9 if necessary.

Task 2.11 – Repair Wellhead. Excavate as needed to replace broken/degraded casing near the well head. Reinstall new locking sealed well caps on each of the wells. Install a traffic rated flush mounted box for each monitoring well.

***PHASE 3: DISCHARGE WELL REHABILITATION***

The discharge well is located near DMW-1 and MW-3 Figure 1). Known construction and design data for this well is included in Appendix D.

Task 3.1 – Mobilization. Ensure wellhead is fully exposed. Locate all necessary equipment at the worksite around the discharge well. Ensure temporary fencing is in place to keep the public from the work area.

Task 3.2 – Fluid Management. Provide adequate on-site tanks for fluid storage, as described in Task 2.2. Install temporary piping to route well discharge into the temporary storage tanks. The discharge piping shall contain valves, fittings, and ports to allow for neutralization of the chemical treatment outlined in Task 3.4 (to a pH of within +/- 0.5 of background as measured before task 4.4 Treatment) in the discharge water, and routing of produced water from the temporary storage tanks to the clarification tanks in the nearby treatment plant. During discharge to the clarification tanks, pH should be measured every 5 minutes until produced water reaches background levels (for one hour or more) to ensure discharged water is fully neutralized. Documentation of discharge water pH, turbidity and treatment chemical quantities used shall be provided to the onsite geologist by the Contactor at the end of rehabilitation and shall be available as needed during rehabilitation.

The temporary storage tanks shall be connected in series, baffled or otherwise configured to facilitate the settlement of solids from the produced water. Discharge water that has been treated (settled to a turbidity of 50 NTU or less) will be pumped from the tanks using a booster pump into the clarification ponds for percolation. Discharged water exiting the settling tanks will be tested and recorded for conformance to turbidity standards every 5 minutes during discharge periods. This will require a temporary pipeline and booster pump to move the water from the tanks to the clarification ponds. Pipeline length for Phases 2 and 3 is estimated at 300 feet as discussed in Task 3. Total water produced during the Phase 3 rehabilitation of the Discharge Well is estimated to be less than 200,000 gallons.

Task 3.3 – Remove Fill/Debris Disposal Well. Use a suction-bailer or air-lift pump to remove fill from the bottom of the discharge well. Sound bottom of well before and after clean out. Fishing tools may be required if piping or other operational equipment is buried in the sediment. Remnants of the old discharge system and other debris have been observed in previous video logs of the well.

Task 3.4 – Acid/Bio-Dispersant. Use a blend of sulfamic modified granular acid (Bariod Aqua-Clear MGA or approved equivalent) and hydroxyacetic liquid acid enhancer (Baroid Aqua-Clear AE or approved equivalent) for the acid treatment program, and apply as directed by manufacturer, and summarized herein. Data sheets for these Chemicals are included in Appendix F. Mix the modified granular acid (MGA) with water at 1 pound per gallon of clean water in a mix tank. The liquid acid enhancer (AE) is then added to the MGA/water mixture at a ratio of 1 gallon AE for every 10 lbs of MGA used, and thoroughly mixed. The acid may be mixed in smaller batches to produce the total volume. For the discharge well approximately 1,500 gallons of acid/bio-dispersant solution is sufficient to displace groundwater in the screen, gravel pack, and some of the formation opposite the well screen.

Place a dispersing tool with swab at the top of the perforations (65 feet depth) and begin pumping acid solution through dispersant tool in the well at roughly 30 gallons per foot, swabbing the acid into the gravel pack at increments of 20 feet (pump in 600 gallons and swab 20 feet for approximately 30 minutes, then proceed to the next interval and repeat to the bottom of perforations). Once the acid has been swabbed in, let stand for 2 hours, then swab again through the screened interval for 30 minutes (without adding acid).
The 2-hour resting period followed by 30-minute swabbing cycles should continue for a period of 8 and allow the acid to stand for 24-hours prior to proceeding to Task 3.5.

Task 3.5 – Hydro-Jetting Use water jetting to clean discharge well screen from 65-105 feet depth in the intake well. This jetting tool should be of an appropriate size for cleaning a 16-inch inner diameter well screen. Work the jetting tool beginning at the top of the screen and, while rotating slowly, lower the tool at approximately 1 minute per foot to the bottom of the screen. From the bottom of the screen, rotate the tool slowly while being pulled upward at approximately 5 minutes per foot of well screen.

Task 3.6 – Zone Pump- Disposal Well. Install a submersible pump capable of a minimum discharge rate of 200-300 gallons per minute. The pump shall be set between two surge blocks within a 10-foot perforated pipe to allow focused zone pumping (this is the zone pumping tool). Using the zone pumping tool, pump and simultaneously swab each 20-foot screened section for 30 minutes, or until discharge water for each section is visually clear of all sediments/debris. Start at the top of the well screen interval and work toward the bottom. Contain initial turbid discharge from each section into storage tanks for settling prior to disposal. After reaching the bottom section of screen, repeat zone pumping starting at top of screen, proceeding until a minimum of 30,000 gallons have been pumped to waste into the storage tanks.

Produced water shall be stored in the on-site tanks after suspended solids have settled, the water will be then pumped through the temporary water line to the treatment plant for percolation and disposal in the plant clarification tanks. Heavy sediment shall be removed from the tanks with a vacuum truck for transport and disposal (see Task 3.10).

Task 3.7 – Video Survey. Perform a color video camera survey of well, using both vertical and side-scanning lenses to record a detailed inspection of the condition of the well casing and louvers. Prior to logging the well will be allowed to stand without operation for 24-hours to allow sediment and turbidity to settle. A video log of the report shall be submitted following the survey, along with two digital copies of the survey. Files larger than 10 MB will be provided on SD card or similar storage device or by link to cloud storage.

Task 3.8– Specific Capacity Test. Install a temporary pump (600 gpm) and a 1-inch minimum inner diameter sounding tube in the discharge well. The pump should be set at least 10 feet below the top of the screens. Install a calibrated flow meter on the discharge line for use in monitoring flow rates. Perform a four-hour constant rate pumping test (600 gpm). Monitor pumping rate and depth (measured to the nearest 0.01 foot) to water every 5 minutes. Discharge water during specific capacity testing may be pumped directly to the plant clarification ponds (bypass settling tanks). At the end of the pumping test documentation for both the pumping rate and water level will be submitted to the onsite hydrogeologist.

Task 3.9–Wellhead Installation. Drill stainless steel threaded bolts in the pad surrounding the well to allow for future discharge equipment to be bolted to the wellhead. Using these bolt holes, install a new sealed cover cap for the well. Bolthead pattern, size, and spacing have been designed by Wallace Group, and are shown in Appendix G.

Task 3.10 – Partial-Demobilization. Remove redevelopment equipment and storage tanks to the intake well site for Phase 4 operations. Haul turbid water with settled solids from tank cleanouts and from well bailing for offsite disposal. Records of disposal (vacuum

truck or other) shall be submitted at the end of the rehabilitation project. Restore the disposal well work site to the same conditions as it was at the start of the project.

## *PHASE 4: INTAKE WELL REHABILITATION*

The intake well is located on the beach approximately 130 feet west of the parking lot (Figure 1). Known construction and design data for this well is included in Appendix E.

Task 4.1 – Mobilization./Rig-up Ensure wellhead is fully exposed and temporary shoring is sufficient for site activities. Locate all necessary equipment at the worksite around the intake well. Ensure temporary fencing is in place to keep the public from the work area.

Task 4.2 – Fluid Management. Provide adequate on-site tanks for fluid storage, as described in Task 2.2. Install temporary piping to route well discharge into the temporary storage tanks. The discharge piping shall contain valves, fittings, and ports to allow for neutralization of the chemical used in Task 4.4 (to a pH of within +/- 0.5 of background as measured before starting Task 4.4 Treatment) in the discharge water, and routing of produced water from the temporary storage tanks to the clarification tanks in the nearby treatment plant. During discharge to the clarification tanks, pH should be measured every 5 minutes until produced water reaches background levels (for one hour or more) to ensure discharged water is fully neutralized.

The temporary storage tanks shall be connected in series, baffled or otherwise configured to facilitate the settlement of solids from the produced water. Discharge water that has been treated (settled to a turbidity of 50 NTU or less) will be pumped from the tanks using a booster pump. Discharged water exiting the settling tanks will be tested for conformance to turbidity standards every 5 minutes during discharge periods and records will be maintained and submitted for review. A temporary water lines should be set to discharge the treated and settled water to the discharge well (Figure 1). This line should be metered to allow flow rates into the discharge to be monitored. Additionally, this temporary water line should have a bypass to allow discharge of some or all of the water into the clarification tanks as needed. Total pipe length needed for fluid management in Phase 4 is approximately 1,100 feet. Total water produced during the Phase 4 rehabilitation of the Discharge Well is estimated to be less than 250,000 gallons. Documentation of discharge water pH, turbidity and treatment chemical quantities used shall be provided to the onsite geologist by the Contactor at the end of rehabilitation and shall be available as needed during rehabilitation.

Task 4.3 – Remove Fill/Debris Intake Well. Use a suction-bailer or air-lift pump to remove fill from the bottom of the well. Sound bottom of well before and after clean out. Fishing tools may be required if piping or other operational equipment is buried in the

sediment. Upon completion of sediment/debris removal the bottom of the well will be tagged to verify total depth of well.

Task 4.4 – Acid/Bio-Dispersant . Use a blend of sulfamic modified granular acid (Bariod Aqua-Clear MGA or approved equivalent) and hydroxyacetic liquid acid enhancer (Baroid Aqua-Clear AE or approved equivalent) for the acid treatment program, and apply as directed by manufacturer, and summarized herein. Data sheets for these chemicals are included in Appendix F. Mix the modified granular acid (MGA) with water at 1 pound per gallon of clean water in a mix tank. The liquid acid enhancer (AE) is then added to the MGA/water mixture at a ratio of 1 gallon AE for every 10 lbs of MGA used, and thoroughly mixed. The acid/bio dispersant mix may be mixed in smaller batches to produce the total volume. For the intake well approximately 600 gallons of acid/bio-dispersant solution is sufficient to displace groundwater in the screen, gravel pack, and some of the formation opposite the well screen.

Place a dispersing tool with swab at the top of the perforations (51 feet depth) and begin pumping acid solution through dispersant tool in the well at roughly 20 gallons per foot, swabbing the acid into the gravel pack at increments of 20 feet (pump in 400 gallons and swab 20 feet for approximately 30 minutes, then proceed to the next interval and repeat to the bottom of perforations). Once the acid has been swabbed in, let stand for 2 hours, then swab again through the screened interval for 30 minutes (without adding acid). The 2-hour resting period followed by 30-minute swabbing cycles should continue for a period of 8 and allow the acid to stand for 24-hours prior to proceeding to Task 4.5.

Task 4.5 – Hydro Jetting. Use water jetting to clean well screen from 51-71 feet depth in the intake well. This jetting tool should be of an appropriate size for cleaning a 12-inch inner diameter well screen.Work the jetting tool beginning at the top of the screen and, while rotating slowly, lower the tool at approximately 1 minute per foot to the bottom of the screen. From the bottom of the screen, rotate the tool slowly while being pulled upward at approximately 5 minutes per foot of well screen.

Task 4.6 – Zone Pump-Intake Well. Install a submersible pump capable of a minimum discharge rate of 200-300 gallons per minute. The pump shall be set between two surge blocks within a 10-foot perforated pipe to allow focused zone pumping (this is the zone pumping tool). Using the zone pumping tool, pump and simultaneously swab each 20-foot screened section for 30 minutes, or until discharge water for each section is visually clear of all sediments/debris. Start at the top of the well screen interval and work toward the bottom. Contain turbid discharge from each section into storage tanks for settling prior to disposal. After reaching the bottom section of screen, repeat zone pumping starting at top of screen, proceeding until a minimum of 30,000 gallons have been pumped to waste into the storage tanks.

After suspended solids have settled from produced water stored in the on-site tanks, the water will be pumped through the temporary water line to the treatment plant clarification tanks for percolation. Heavy sediment shall be removed from the storage (settling) tanks with a vacuum truck for transport and disposal (see Task 4.10).

Task 4.7 – Video Survey. Perform a color video camera survey of well, using both vertical and side-scanning lenses to record a detailed inspection of the condition of the well casing and louvers. Prior to logging the well will be allowed to stand without operation for 24-hours to allow sediment and turbidity to settle. A video log of the report shall be submitted following the survey, along with two digital copies of the survey. Files larger than 10 MB will be provided on SD card or similar storage device or by link to cloud storage.

Task 4.8 – Specific Capacity Test (6 hours). Install a temporary pump (600 gpm capacity) and a 1-inch minimum inner diameter sounding tube in the discharge well. The pump should be set at least 10 feet below the top of the screens. Install a calibrated flow meter on the discharge line for use in monitoring flow rates. Perform a four-hour constant rate pumping test (550 gpm). At the end of 4 hours the pump rate will be increased to 600 gpm for an additional 2 hours or until water levels reach the top of the screened interval. For the duration of the pumping test, monitor pumping rate and depth (measured to the nearest 0.01 foot) to water every 5 minutes. Discharge water during specific capacity testing will be pumped directly to the discharge well (bypass settling tanks). If needed, a portion of the flow may be diverted to the clarification tanks. At the end of the pumping test documentation for both the pumping rate and water level will be submitted to the onsite hydrogeologist.

Task 4.9 –Close Well. Remove pumping equipment, re-install wellhead cover to seal the well.

Task 4.10 – Demobilize/Rig-Down. Remove redevelopment equipment and storage tanks. Haul turbid water with settled solids from tank cleanouts and from well bailing for offsite disposal. Records of disposal (vacuum truck or other) shall be submitted at the end of the rehabilitation project. Restore the intake well work site to the same conditions as it was at the start of the project.

# APPENDIX A
# DMW-1 DOCUMENTATION

ORIGINAL FC # 216096
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
# WELL COMPLETION REPORT
*Refer to Instruction Pamphlet*

No. 474423

DWR USE ONLY — DO NOT FILL IN
14S/01E-24L52
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
14S/01E24L52
APN/TRS/OTHER

Owner's Well No. DMW-1
Date Work Began 1/19/96 Ended 1/19/96
Local Permit Agency Monterey County Environ Health
Permit No. _____ Permit Date _____

## GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

| DEPTH FROM SURFACE Ft. | to Ft. | DESCRIPTION *Describe material, grain size, color, etc.* |
|---|---|---|
| 0 | 12 | Brown dune sand. |
| 12 | 30 | Yel/Brown, med to crs sand |
| 30 | 40 | Reddish brown silt |
| 40 | 110 | Yel/Brown, med to crs sand |
| 110 | 125 | Dark brown silt |
| 125 | 144 | Sand & Gravel |
| 144 | 162 | Silty Sand; w/ layers of gravel |
| 162 | 175 | Sand & gravel |
| 175 | 198 | Olive gray silty clay |
| 200 | 240 | Gravel w/ sand & layers of silty clay |

TOTAL DEPTH OF BORING 240 (Feet)
TOTAL DEPTH OF COMPLETED WELL 235 (Feet)

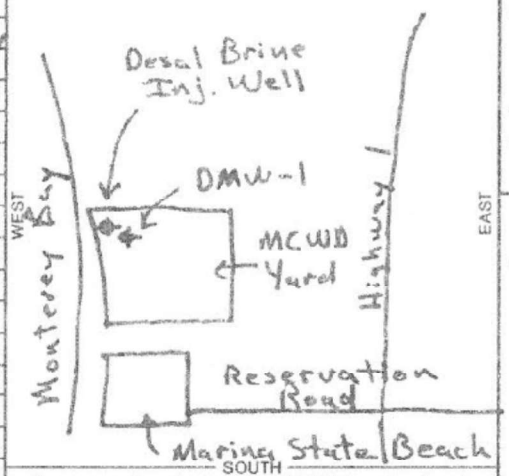
## WELL OWNER

[redacted]

## WELL LOCATION

Address 11 Reservation Rd
City Marina
County Monterey
APN Book ___ Page ___ Parcel ___
or Township ___ Range ___ Section ___
or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. W

### LOCATION SKETCH




*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.*
***PLEASE BE ACCURATE & COMPLETE.***

### ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

### PLANNED USE (✓)

✓ MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Direct Rotary FLUID Guar Gum

### WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

## CASING(S)

| DEPTH FROM SURFACE Ft. | to Ft. | BORE-HOLE DIA. (Inches) | TYPE (✓) BLANK | SCREEN | CONDUCTOR | FILL PIPE | MATERIAL/GRADE | INTERNAL DIAMETER (Inches) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 190 | 6 3/4 | ✓ | | | | PVC, Sch 40 | 2 | Sch 40 | — |
| 190 | 230 | " | | ✓ | | | " | " | " | 0.020 |
| 230 | 235 | " | ✓ | | | | " | " | " | — |

## ANNULAR MATERIAL

| DEPTH FROM SURFACE Ft. | to Ft. | TYPE CEMENT (✓) | BENTONITE (✓) | FILL (✓) | FILTER PACK (TYPE/SIZE) |
|---|---|---|---|---|---|
| 0 | 170 | ✓ | | | |
| 170 | 240 | | | | Pea Gravel |

## ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

## CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME Eugro West, Inc / R.L. Redfearn Drilling (Bakersfield)
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5855 Olivas Park Dr ADDRESS Ventura CITY CA STATE 93003 ZIP

Signed Michael S Burke WELL DRILLER/AUTHORIZED REPRESENTATIVE 1/20/96 DATE SIGNED 628851 C-57 LICENSE NUMBER

DWR 188 REV 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

# APPENDIX B
# MW-2 DOCUMENTATION

**ORIGINAL**

**File with DWR**

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

# WATER WELL DRILLERS REPORT

*Do not fill in*

No. 201228

State Well No. 14/01-24

Other Well No.

Notice of Intent No.

Local Permit No. or Date 5923

## (2) LOCATION OF WELL (See instructions):

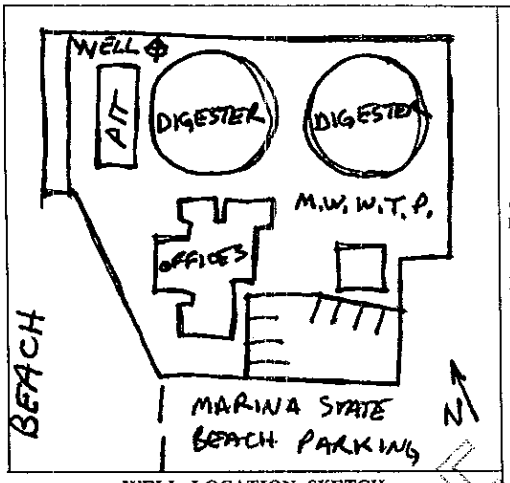
County MONTEREY Owner's Well Number 3

Well address if different from above

Township 14 S Range 1 E Section 24

Distance from cities, roads, railroads, fences, etc.

10' FROM FENCE, IN CENTER OF ROADWAY




WELL LOCATION SKETCH

## (3) TYPE OF WORK:

New Well [X] Deepening [ ]
Reconstruction [ ]
Reconditioning [ ]
Horizontal Well [ ]
Destruction [ ] (Describe destruction materials and procedures in Item 12)

## (4) PROPOSED USE:

Domestic [ ]
Irrigation [ ]
Industrial [ ]
Test Well [ ]
Stock [ ]
Municipal [ ]
Other OBSERVATION [X]

## (5) EQUIPMENT:

Rotary [X] Reverse [ ]
Cable [ ] Air [ ]
Other [ ] Bucket [ ]

## (6) GRAVEL PACK:

Yes [X] No [ ] Size LAPIS #3

Diameter of bore 6"

Packed from 100 to 75 ft.

## (7) CASING INSTALLED:

Steel [ ] Plastic [X] Concrete [ ]

| From ft. | To ft. | Dia. in. | Gage or Wall |
|---|---|---|---|
| 0 | 85 | 2 | SCH40 |
| 95 | 100 | 2 | SCH40 |

## (8) PERFORATIONS:

Type of perforation or size of screen

| From ft. | To ft. | Slot size |
|---|---|---|
| 85 | 95 | 0.020 |

## (9) WELL SEAL:

Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 75 ft.

Were strata sealed against pollution? Yes [ ] No [X] Interval ft.

Method of sealing NEAT CEMENT PUMPED THRU TREMIE

## (10) WATER LEVELS:

Depth of first water, if known ft.

Standing level after well completion ft.

## (11) WELL TESTS:

Was well test made? Yes [ ] No [X] If yes, by whom?

Type of test Pump [ ] Bailer [ ] Air lift [ ]

Depth to water at start of test ft. At end of test ft.

Discharge gal/min after hours Water temperature

Chemical analysis made? Yes [ ] No [X] If yes, by whom?

Was electric log made? Yes [ ] No [X] If yes, attach copy to this report

## (12) WELL LOG:

Total depth 100 ft. Depth of completed well 100 ft.

| from ft. | to ft. | Formation (Describe by color, character, size or material) |
|---|---|---|
| 0 | 98 | DUNE SANDS |
| 98 | 100 | YELLOWISH BROWN SILT |

Work started DEC. 21 19 90 Completed DEC. 21 19 90

## WELL DRILLER'S STATEMENT:

*This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.*

SIGNED C.E.G. 1454 (Well Driller)

NAME DON'S DRILLING (Person, firm, or corporation) (Typed or printed)

Address 212 PILOT AVENUE

City BAKERSFIELD Zip 93308

License No. C57-280951 Date of this report 12-31-90

DO NOT PUBLIC USE
WATER QUALITY SEC. 13752

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

## Table 1. Well Information Summary

| Well Name | Reference Elevation | Drill Depth | Casing Depth | Perforations - Depth | | Perforations - Elevation | | Seal Depth |
|---|---|---|---|---|---|---|---|---|
| | | | | Top | Bottom | Top | Bottom | |
| DMW-1 | 60 | 240 | 235 | 190 | 230 | -130 | -170 | 170 |
| DMW-2 | 61 | 240 | 235 | 180 | 230 | -119 | -169 | 165 |
| MW-2 | 60 | 100 | 100 | 85 | 95 | -25 | -35 | 75 |
| MW-4 | 61 | 115 | 110 | 65 | 105 | -4 | -44 | 50 |
| MW-5 | 61 | 110 | 105 | 60 | 100 | 1 | -39 | 50 |

Notes: Depths are in feet
Elevations are in feet above/below mean sea level

## Table 2. Water Level/Water Quality Summary

| Well Name | Reference Elevation | Perforation Elevation | | Static Water Level | | TDS (mg/l)[1] | |
|---|---|---|---|---|---|---|---|
| | | Top | Bottom | April | October | April | October |
| DMW-1 | 60 | -130 | -170 | -5.6 | -5.9 | 27,840 | 27,540 |
| DMW-2 | 61 | -119 | -169 | -3.7 | -4.1 | 27,000 | 26,940 |
| MW-2 | 60 | -25 | -35 | 3.8 | 2.3 | 26,940 | 27,480 |
| MW-4 | 61 | -4 | -44 | 6.8 | 3.0 | 22,200 | 17,100 |
| MW-5 | 61 | -1 | -39 | 6.3 | 5.8 | 7,920 | 4,780 |

[1] The TDS of seawater is approximately 35,000 mg/l.

# APPENDIX C
# MW-3 DOCUMENTATION

**ORIGINAL**

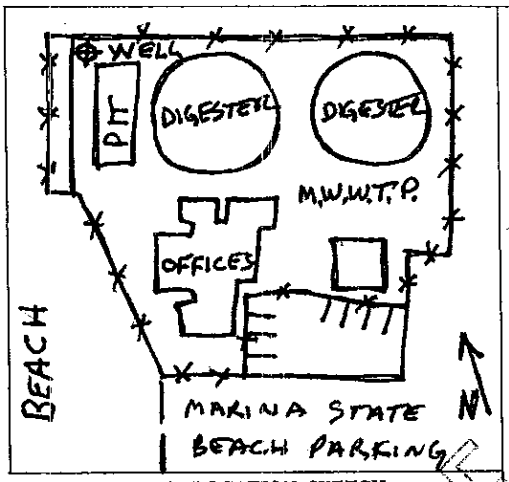
**File with DWR**

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
# WATER WELL DRILLERS REPORT

*Do not fill in*
No. 201227
State Well No. 14/01-24
Other Well No.

Notice of Intent No.
Local Permit No. or Date 5922

## (2) LOCATION OF WELL (See instructions):
County MONTEREY Owner's Well Number 2
Well address if different from above
Township 14S Range 1E Section 24
Distance from cities, roads, railroads, fences, etc.
10' FROM FENCE, IN CENTER OF ROADWAY



WELL LOCATION SKETCH

## (3) TYPE OF WORK:
New Well [X] Deepening [ ]
Reconstruction [ ]
Reconditioning [ ]
Horizontal Well [ ]
Destruction [ ] (Describe destruction materials and procedures in Item 12)

## (4) PROPOSED USE:
Domestic [ ]
Irrigation [ ]
Industrial [ ]
Test Well [X]
Stock [ ]
Municipal [ ]
Other [ ]

## (5) EQUIPMENT:
Rotary [X] Reverse [ ]
Cable [ ] Air [ ]
Other [ ] Bucket [ ]

## (6) GRAVEL PACK:
Yes [X] No [ ] Size LAPIS #3
Diameter of bore 12¼
Packed from 117 to 25 ft.

## (7) CASING INSTALLED:
Steel [ ] Plastic [X] Concrete [ ]

| From ft. | To ft. | Dia. in. | Gage or Wall |
|---|---|---|---|
| 0 | 67 | 6 | SDR 21 |
| 107 | 117 | 6 | SDR21 |

## (8) PERFORATIONS:
Type of perforation or size of screen

| From ft. | To ft. | Slot size |
|---|---|---|
| 67 | 107 | 0.040 |

## (9) WELL SEAL:
Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 25 ft.
Were strata sealed against pollution? Yes [ ] No [X] Interval ft.
Method of sealing NEAT CEMENT PUMPED THRU TREMIE

## (10) WATER LEVELS:
Depth of first water, if known NA ft.
Standing level after well completion 57.5' ft.

## (11) WELL TESTS:
Was well test made? Yes [ ] No [X] If yes, by whom?
Type of test Pump [ ] Bailer [ ] Air lift [ ]
Depth to water at start of test ft. At end of test ft.
Discharge gal/min after hours Water temperature
Chemical analysis made? Yes [ ] No [X] If yes, by whom?
Was electric log made? Yes [ ] No [X] If yes, attach copy to this report

## (12) WELL LOG:
Total depth 130 ft. Depth of completed well 117 ft.

| from ft. | to ft. | Formation (Describe by color, character, size or material) |
|---|---|---|
| 0 | 107 | DUNE SANDS |
| 107 | 130 | YELLOWISH BROWN SILT |

Work started DEC. 20, 19 90 Completed DEC. 21, 19 90

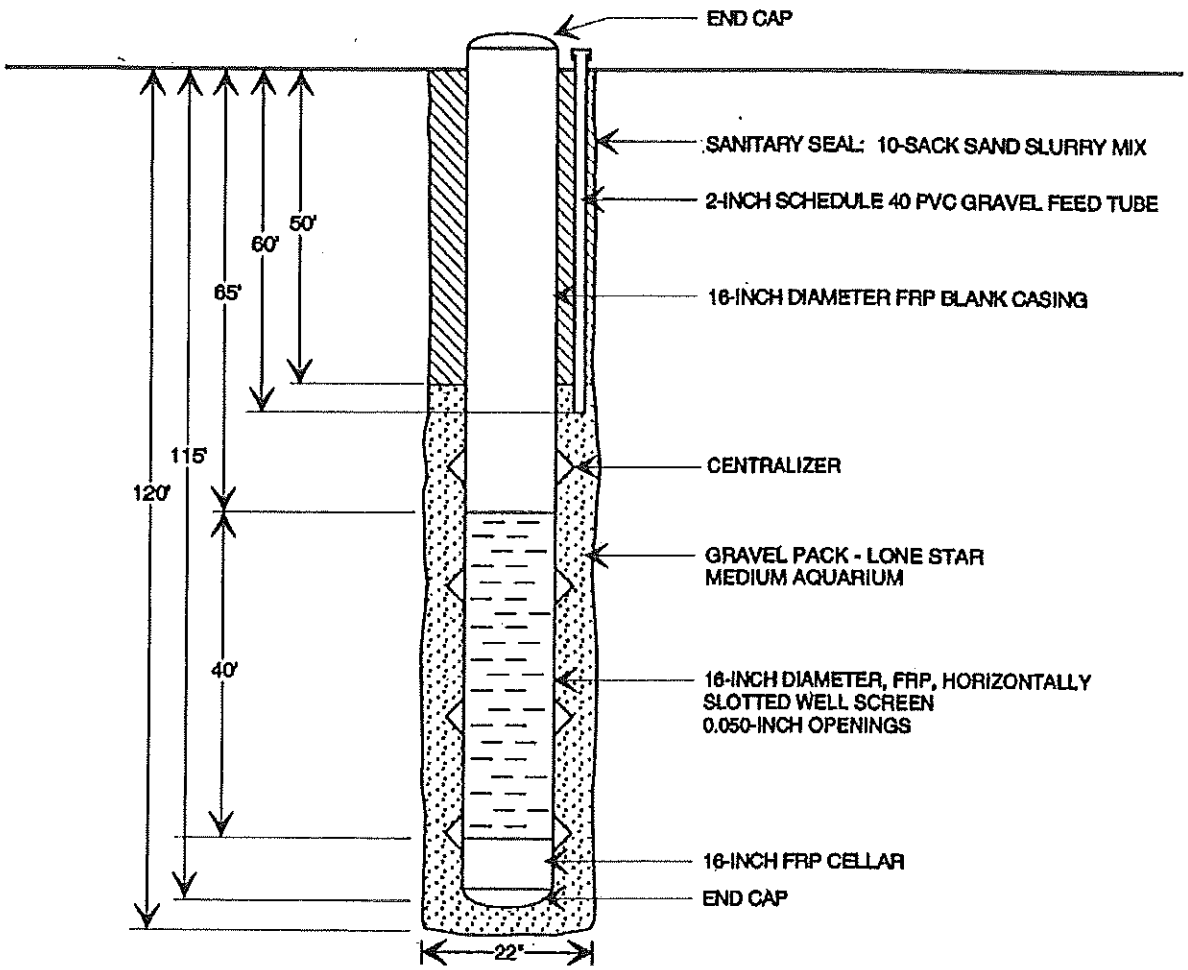
## WELL DRILLER'S STATEMENT:
*This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.*

SIGNED (Well Driller) C.E.G. 1459
NAME DON'S DRILLING (Person, firm, or corporation) (Typed or printed)
Address 212 PILOT AVENUE
City BAKERSFIELD Zip 93308
License No. C57-280951 Date of this report 12-31-90

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
FOR PUBLIC USE
SEC. 13752
UNDER WELL CODE

# APPENDIX D
# DISCHARGE WELL DOCUMENTATION




**NOT TO SCALE**

## BRINE INJECTION WELL
Marina Coast Water District

PLATE 3

**MARINA DESALIIZATION PLANT DISCHARGE WELL DATA**

**Location:** Marina Beach State Park, Reservation Road, Marina, California

**Latitude/Longitude:** 36.70024, -121.80888

**Wellhead:** Square, concrete slab approximately 96-inches by 96-inches centered around the well. The wellhead sits 14-inches above the top of the slab. The casing is surrounded by a cylindrical cement surround which is 29-inches in diameter. The casing is flush with the top of the cement surround. A round steel plate (diamond plate) is bolted over the wellhead with four ¼-20 bolts/nuts that are set in the cement. Bolts are severely corroded and plate cover does not prevent sand/trash infiltration.

**Total Depth:** As-built 115 feet bgs, filled with sediment/debris below 87.5 feet bgs.

**Seal:** 50 foot, 10-sack sand slurry mix

**Filter Media:** Lone Star Medium Aquarium Mix, 50-120 feet bgs

**Casing Material:** 16-inch inner diameter fiber would polymer casing with a 0.24-inch wall thickness.

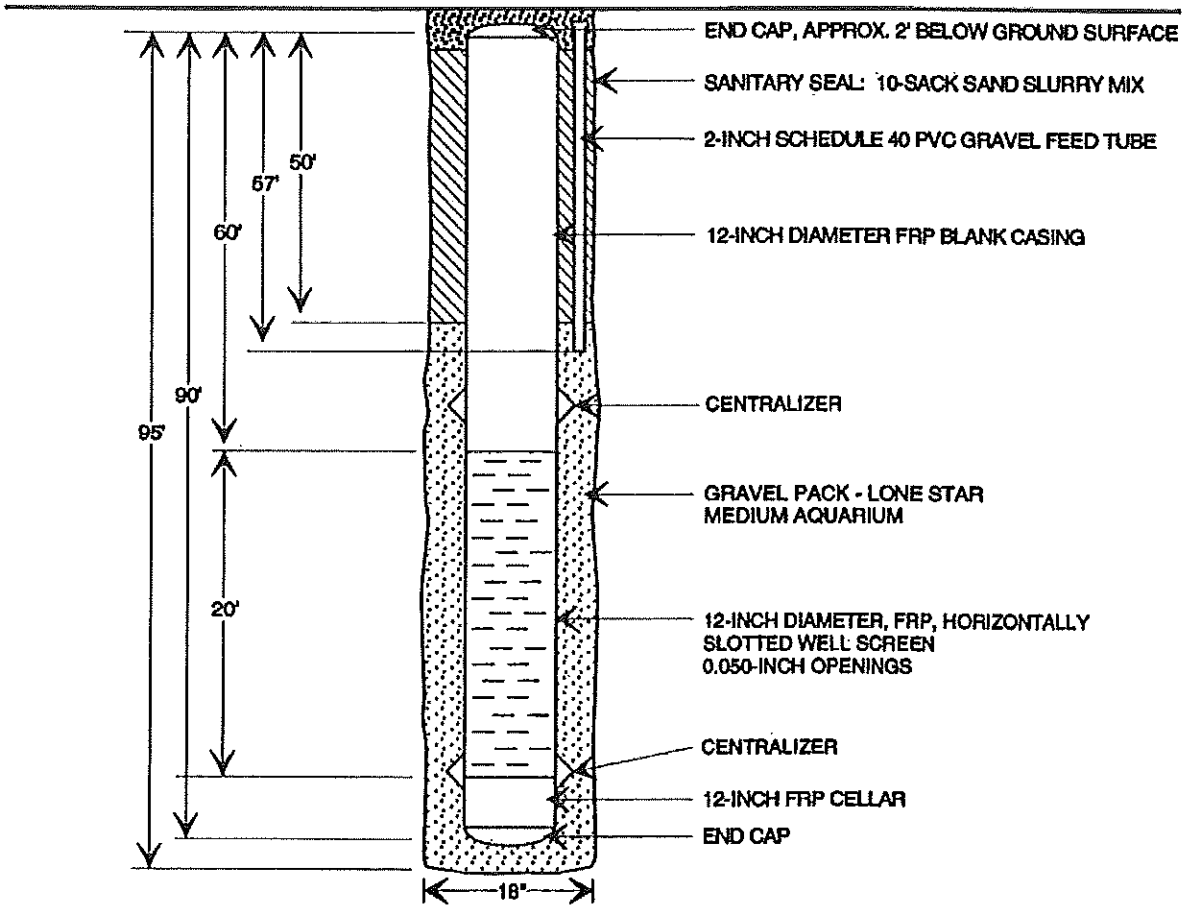
**Screen Material:** 16-inch inner diameter fiber wound polymer, 0.050 inch horizontal slot.

**Construction:** 0-65 feet below top of casing, blank casing
65-105 feet below top of casing, screen
105-115 feet below top of casing, blank casing with end cap

**Water Level:** 58.13 feet below top of casing on 21 September 2025 at 10:45

**Comments:** Video was performed in November 2024 and in March 2025. The November video showed the remains of downhole components (pipe of unknown diameter) extending to sand which has infilled the well to approximately 87 feet below top of casing. This material was removed to the sand line (87 feet below top of casing) by the March 2025 video but there may be additional downhole assembly within the sand fill at the bottom of the well. Both videos showed buildup of sand on all the screen louvres and significant organic/biological buildup in the screens as well. Plastic bottles were observed floating at/near the water line and given sight conditions, glass bottles or other non-well related debris may be in the sand at the bottom of the well. Previous surveys indicated a discharge line was in the bottom of the well and may now be covered/buried in the debris.

# APPENDIX E
# INTAKE WELL DOCUMENTATION




**NOT TO SCALE**

**SEAWATER INTAKE WELL**
Marina Coast Water District

PLATE 2

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
# WELL COMPLETION REPORT
*Refer to Instruction Pamphlet*

DWR USE ONLY – DO NOT FILL IN
14S/01E-24L5Ø
STATE WELL NO./STATION NO.
LATITUDE | LONGITUDE
APN/TRS/OTHER

Owner's Well No. Seawater Intake Well (SIW) No. 474426
Date Work Began 1/24/96 Ended 1/24/96
Local Permit Agency Monterey County Environ. Health
Permit No. WSAL 95-331 Permit Date 12/21/95

## GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 32 (FT.) BELOW SURFACE

| DEPTH FROM SURFACE Ft. | to Ft. | DESCRIPTION *Describe material, grain size, color, etc.* |
|---|---|---|
| 0 | 20 | Brown dune sand. |
| 20 | 42 | Yellow/brown med gr. sand |
| 42 | 60 | Gray/brown, med gr. sand |
| 60 | 83 | Coarse sand. |
| 83 | 95 | Dark olive brown silt. |

TOTAL DEPTH OF BORING 95 (Feet)
TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

## WELL OWNER

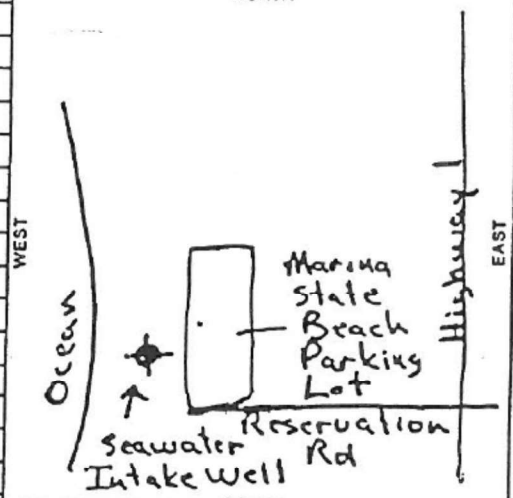
14S/01E-24L5Ø

[redacted]

## WELL LOCATION

Address 11 Recreation Rd (Marina State Beach)
City Marina
County Monterey
APN Book 033 Page 192 Parcel 001
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

## LOCATION SKETCH




*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.*

## ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

## PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
✓ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Direct Rotary FLUID Guar Gums

## WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

## CASING(S)

| DEPTH FROM SURFACE Ft. | to Ft. | BORE-HOLE DIA. (Inches) | TYPE (✓) BLANK | SCREEN | CONDUCTOR | FILL PIPE | MATERIAL/GRADE | INTERNAL DIAMETER (Inches) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 60 | 18 | ✓ | | | | Fiberglass | 12 | 0.241" | — |
| 60 | 80 | " | | ✓ | | | " | " | | 0.050 |
| 80 | 90 | " | ✓ | | | | " | " | | — |

## ANNULAR MATERIAL

| DEPTH FROM SURFACE Ft. | to Ft. | TYPE CEMENT (✓) | BENTONITE (✓) | FILL (✓) | FILTER PACK (TYPE/SIZE) |
|---|---|---|---|---|---|
| 0 | 50 | ✓ | | | |
| 50 | 95 | | | | Lone Star Med Aq. |

## ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

## CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME FugroWest Inc./R.L. Redfearn Drilling (Bakersfield)
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5855 Olivas Park Dr. Ventura CA 93003
ADDRESS CITY STATE ZIP

Signed Michael S Burke 1/24/96 628851
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

WR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

State No. 14S/01E-24L5

# WELL DATA

DISTRICT MARINA

[redacted]

State No. 14S/01E-24L5
Other No.

Type of Well: Hydrograph ☐ Key ☐ Index ☐ Semiannual ☐
Location: County Monterey Basin No.
U.S.G.S. Quad. Quad. No.
¼ ¼ Section , Twp. , Rge. MD SB H Base & Meridian
Description Marina Coast Water District Desalination Plant Sea Water Intake Well located on the Marina State Beach.

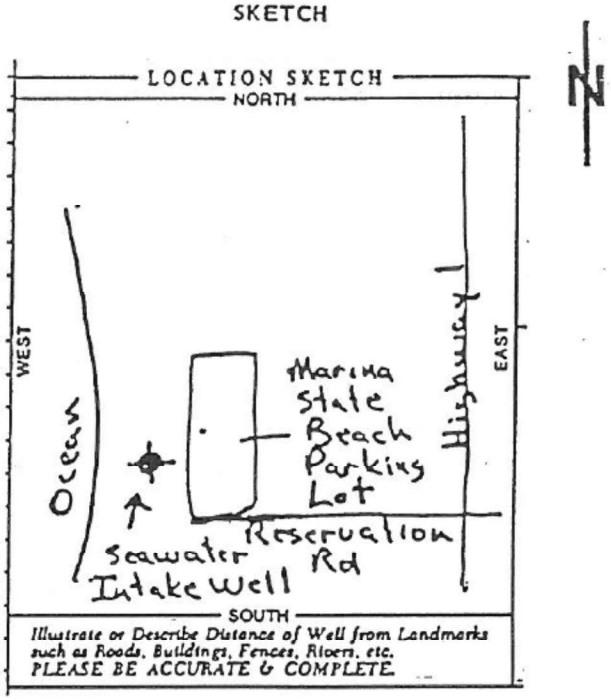
Reference Point description

which is ft. above/below land surface. Ground Elevation ft.
Reference Point Elev. ft. Determined from
Well: Use Sea Water Intake Well Condition Depth 90 ft.
Casing, size 12 in., perforations 60 - 80 ft

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐
Chief Aquifer: Name Depth to Top Aq. Depth to Bot. Aq.
Type of Material Perm. Rating Thickness
Gravel Packed? Yes ☑ No ☐ Depth to Top Gr. Depth to Bot. Gr.
Supp. Aquifer Depth to Top Aq. Depth to Bot. Aq.
Driller Fugro West Inc./Redfairn Drilling (Bakersfield)
Date drilled Jan 24, 196 Log, filed Jan 24, 1996 open (1) confidential (2)
Equipment: Pump, type Submersible, ss make Grundfos
Serial No. Size of discharge pipe 6/12 in.
Power, Kind Electric Make Grundfos
H. P. 30 Motor Serial No.
Elec. Meter No. 435035 Transformer No. T-1776
Yield 520 G.P.M. Pumping level 56 ft.

Water Analysis: Min. (1) Son. (2) H.M. (3)
Water Levels available: Yes (1) No
Period of Record: Begin End
Collecting Agency:
Prod. Rec. (1) Pump Test (2) Yield (3)

SKETCH




*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.*

REMARKS

Recorded by: Manuel Saavedra
Date 5-30-97

**MARINA DESALIIZATION PLANT INTAKE WELL DATA**

**Location:** Marina Beach State Park, Reservation Road, Marina, California

**Latitude/Longitude:** 36.69857, -121.80952

**Wellhead:** The wellhead is located on the beach and is buried approximately 5 feet below the sand surface. The well lacks any sort of wellhead, but is instead covered with a flange which is epoxied onto the casing. The flange is 20-inches in diameter. This flange supports twelve 7/8-inch bolts which hold a cover onto the wellhead.

**Total Depth:** Unknown

**Seal:** As built, 50 feet. Currently estimated to be 40 feet of seal remaining.

**Filter Media:** Lone Star Medium Aquarium

**Casing Material:** 12-inch inner diameter fiber would polymer casing with a 0.24 inch wall thickness.

**Screen Material:** 12-inch inner diameter fiber wound polymer milled slot screen, 0.050 inch horizontal slot.

**Construction(current not as built):** 0-51 feet below top of casing, blank casing
51-71 feet below top of casing, screen
71-81 feet below top of casing, blank casing with end cap

**Water Level:** 15.74 feet below top of casing on 21 September 2025 at 14:00.

**Comments:** A video log was recorded in November 2024 and in March 2025. During the video logging run in 2024, spray equipment which was in casing at 53 feet was knocked to bottom of hole by camera. This and other downhole equipment are resting on and in the sand that has partially filled the well casing. Sand was tagged at 73.2 feet below the top of casing. During the video logs of the well sand and organic material was observed in the screen slots.

The topmost portion of the well was lost to coastal erosion. The original casing was removed and a flanged cover was installed. Based on the video and the as built diagrams, approximately nine feet, based on the original as-built diagrams and video logs, was removed. This leaves an approximately 40 foot-seal, but this has not been validated with downhole logs. The as build seal was 50-feet in depth.

# APPENDIX F
# CHEMICAL DATA SHEETS

# AQUA-CLEAR® MGA

**Modified Granular Acid**

**Description**

AQUA-CLEAR MGA is a dry blend of granular acid and additives used in the removal of iron, manganese and carbonate scale. It retains strength longer than most liquid acids, which increases its cleaning capability.

**Applications/Functions**

- Disperse scale and incrustation
- Remove scale and incrustation from the water well screen, casing, gravel pack and pumping equipment
- Restore well production
- AQUA-CLEAR MGA can be used in combination with AQUA-CLEAR® AE to remove more difficult scale and incrustation

**Advantages**

- NSF/ANSI/CAN Standard 60 certified
- Safe to use on all plastics, rubber, and metals
- No harmful vapors
- Improves water quality (color, taste and appearance)
- Reduces equipment and piping failures due to scale build-up and corrosion
- Reduces pumping costs

**Typical Properties**

| | |
|---|---|
| Appearance | Free-flowing, off-white granules |
| Specific gravity | 2.00 |
| pH (10% solution) | 0.9 |
| Solubility in water | Complete with slight to hazy turbidity |

**Recommended Treatment**

***To treat bacteria fouling and scale encrustation:***

*© Copyright 2024 Halliburton*

*AQUA-CLEAR is a registered trademark of Halliburton*

*Rev. 11/2024 IDP 040*

Because the conditions of use of this product are beyond the seller's control, the product is sold without warranty either express or implied and upon condition that purchaser make its own test to determine the suitability for purchaser's application. Purchaser assumes all risk of use and handling of this product. This product will be replaced if defective in manufacture or packaging or if damaged. Except for such replacement, seller is not liable for any damages caused by this product or its use. The statements and recommendations made herein are believed to be accurate. No guarantee of their accuracy is made, however.

- Record initial well water pH.
- It is always recommended to mix acid formulations in pre-determined volumes of freshwater on the surface and ensure they are uniformly mixed prior to placement into the screened interval of the well.
- The preferred application method is to apply the mixture containing AQUA-CLEAR MGA into the screened interval through a dual disc surge tool that is perforated between the discs. This allows the user to uniformly treat the entire screened interval with the acid solution.
- Mix AQUA-CLEAR MGA with water at 1.0 pound per gallon of water or 120 kg/$m^3$ of water and apply directly into screened interval using a dual disc surge tool with perforations between the discs or a tremie pipe.
- When utilizing this method, the minimum calculated volume of water can be determined by using the borehole diameter and the length of the screened interval and double the calculated volume to account for the water present inside the screen, gravel pack and the formation interface.

**Recommended Treatment (continued)**

***Note: The above concentration of* AQUA-CLEAR MGA *is recommended for a complete rehabilitation/reconditioning of an existing well.***

- Displace solution into the well screen and formation, then surge, swab, agitate or jet well through screen and gravel pack for 20-30 minutes.
- Allow to stand in well for up to two hours and then repeat activity approximately every two hours for a period of 24 hours.
- Pump well water to captured waste until produced well water pH is within 0.5 of original well pH.

***Note: Wastewater can be neutralized by adding soda ash or lime.***

- Once turbidity specifications and pH requirements have been met then and only then can the well be chlorinated and reconnect to water distribution system.
- Remember in many locations it is required to capture and submit a water sample for bacterial analysis to confirm the water is safe before reconnecting to the distribution system.

***Caution: Never mix chlorine and AQUA-CLEAR MGA in well.***

***Notes:***

- **To optimize outcome, it is always recommended to begin by airlifting any biomass and debris from the well. To better prepare the well for rehabilitation, the second step is to remove as much encrustation and biomass mechanically from the interior of the**
- **To achieve the best rehabilitation outcome, it is always recommended to mix AQUA-CLEAR AE and AQUA-CLEAR MGA together to enhance penetration of scale and biomass materials.**

**Safety**

- AQUA-CLEAR MGA is safe to handle when in dry form, but when mixed with water it should be handled in accordance with recognized standard practices for handling corrosive and acidic materials (refer to Safety Data Sheet).
- Avoid skin and eye contact – flush with water.
- Do not ingest and avoid prolonged inhalation.
- When disposing of waste fluid make sure to comply with all federal, state and local regulations as applicable.

**Packaging**

AQUA-CLEAR® MGA is packaged in 5-gal (19-liter) pails containing 50 pounds (22.7 kg) or 550-lb (250 kg) drums.

**Shipping**

The following are required for commercial transport:

- Insurance policy must include an endorsement for transporting hazardous cargo.
- Vehicle driver must have a Hazmat endorsement on his/her Commercial Driver's License.
- Hazardous Materials Certificate of Registration issued by the U.S. Department of Transportation (renewable annually) is required.
- Consult the state in which operating for any additional requirements that may exist.
- No hazardous materials placard is required for shipments less than 1000 pounds.

**Availability**

AQUA-CLEAR MGA can be purchased through any Baroid Industrial Drilling Products Retailer. To locate the Baroid IDP retailer nearest you contact the Customer Service Department in Houston or your area IDP Sales Representative.


**Baroid Industrial Drilling Products**

**Product Service Line, Halliburton**

3000 N. Sam Houston Pkwy E.

Houston, TX 77032

| | | |
|---|---|---|
| **Customer Service** | (800) 735-6075 Toll Free | (281) 871-4612 |
| **Technical Service** | (877) 379-7412 Toll Free | (281) 871-4613 |

# AQUA-CLEAR® AE

**Acid Enhancer/Antifoulant**

**Description**

AQUA-CLEAR® AE is a liquid blend of acids and acid enhancers formulated to control bacterial slime contamination due to the presence of iron-related and sulphate-reducing bacteria.

**Applications/Functions**

- Remove the biomass matrix caused by bacterial fouling
- Reduce sulfur taste and odor in water
- Clean up well screens, pumps and distribution system
- Restore well productivity and reduce power and maintenance costs
- AQUA-CLEAR AE can be used in combination with AQUA-CLEAR® MGA and other acids such as, hydrochloric (muriatic), phosphoric and sulfamic to enhance their effectiveness and to remove more difficult scale and incrustation

**Advantages**

- NSF/ANSI/CAN Standard 60 certified
- Safe to use on all plastics, rubber and metals
- Cost effective, efficient extended life treatment
- Improves water quality and renews well production rate
- Mitigates corrosion and equipment failure
- Reduces pumping costs

**Typical Properties**

| | |
|---|---|
| Appearance | Light amber colored liquid |
| Specific gravity | 1.08 |
| pH of solution | 1.1 |

**Recommended Treatment**

***To treat bacteria fouling and scale encrustation:***

- Record initial well water pH.
- It is always recommended to mix acid formulations in pre-determined volumes of freshwater on the surface and ensure they are uniformly mixed prior to placement into the screened interval of the well.
- The preferred application method is to apply the mixture containing AQUA-CLEAR AE into the screened interval through a dual disc surge tool that is perforated between the discs. This allows the user to uniformly treat the entire screened interval with the acid solution.
- Mix AQUA-CLEAR AE with water at 9.5 gallon per 100 gallons of water or 95 L per $m^3$ of water and apply directly into screened interval using a dual disc surge tool with perforations between the discs or a tremie pipe.

**Recommended Treatment (continued)**

- When utilizing this method, the ***minimum*** calculated volume of water can be determined by using the borehole diameter and the length of the screened interval and double the calculated volume to account for the water present inside the screen, gravel pack and the formation interface.

***Note: The above concentration of* AQUA-CLEAR AE *is recommended for a complete rehabilitation/reconditioning of an existing well.***

- Displace solution into the well screen and formation, then surge, swab, agitate or jet well through screen and gravel pack for 20-30 minutes.
- Allow to stand in well for up to two hours and then repeat activity approximately every two hours for a period of 24 hours.
- Pump well water to captured waste until produced well water pH is within 0.5 of original well pH.

***Note: Wastewater can be neutralized by adding soda ash or lime.***

- Once turbidity specifications and pH requirements have been met then and only then can the well be chlorinated and reconnect to water distribution system.
- Remember in many locations it is required to capture and submit a water sample for bacterial analysis to confirm the water is safe before reconnecting to the distribution system.

***Caution: Never mix chlorine and* AQUA-CLEAR AE *in well.***

***Notes:***

- ***To optimize outcome, it is always recommended to begin by airlifting any biomass and debris from the well. To better prepare the well for rehabilitation, the second step is to remove as much encrustation and biomass mechanically from the interior of the casing and screen and then pump or airlift the debris to waste prior to treating with acid.***
- ***To achieve the best rehabilitation outcome, it is always recommended to mix AQUA-CLEAR AE and AQUA-CLEAR MGA together to enhance penetration of scale and biomass materials.***

**Safety**

- Use recognized standard practices for handling corrosive and acidic materials (refer to Material Safety Data Sheet).
- Avoid skin and eye contact – flush with water.
- Do not ingest and avoid prolonged inhalation.
- When disposing of waste fluid make sure to comply with all federal, state and local regulations as applicable.

**Packaging**

AQUA-CLEAR AE is packaged in a 5-gallon (19-liter) plastic container or in 55-gallon (208-liter) drums.

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*Rev. 11/12/2024*

Because the conditions of use of this product are beyond the seller's control, the product is sold without warranty either express or implied and upon condition that purchaser make its own test to determine the suitability for purchaser's application. Purchaser assumes all risk of use and handling of this product. This product will be replaced if defective in manufacture or packaging or if damaged. Except for such replacement, seller is not liable for any damages caused by this product or its use. The statements and recommendations made herein are believed to be accurate. No guarantee of their accuracy is made, however.

**Shipping**

- The following are required for commercial transport:
- Insurance policy must include an endorsement for transporting hazardous cargo.
- Vehicle driver must have a Hazmat endorsement on his/her Commercial Driver's License.
- Hazardous Materials Certificate of Registration issued by the U.S. Department of Transportation (renewable annually) is required.
- Consult the state in which operating for any additional requirements that may exist.
- No hazardous materials placard is required for shipments less than 1000 pounds.

**Availability**

AQUA-CLEAR AE can be purchased through any Baroid Industrial Drilling Products Retailer. To locate the Baroid IDP retailer nearest you, contact the Customer Service Department in Houston or your area IDP Sales Representative.


**Baroid Industrial Drilling Products**

**Product Service Line, Halliburton**

3000 N. Sam Houston Pkwy E.

Houston, TX 77032

| | | |
|---|---|---|
| **Customer Service** | (800) 735-6075 Toll Free | (281) 871-4612 |
| **Technical Service** | (877) 379-7412 Toll Free | (281) 871-4613 |



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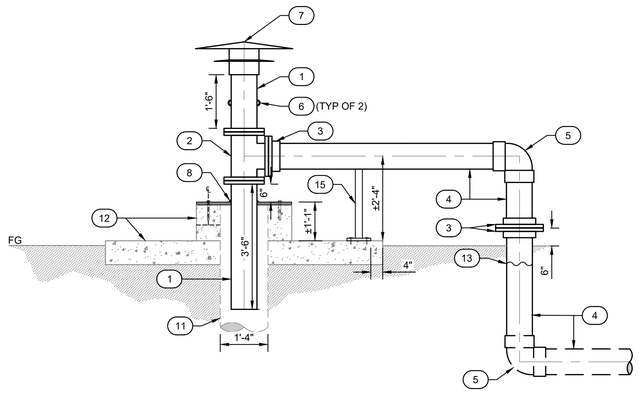
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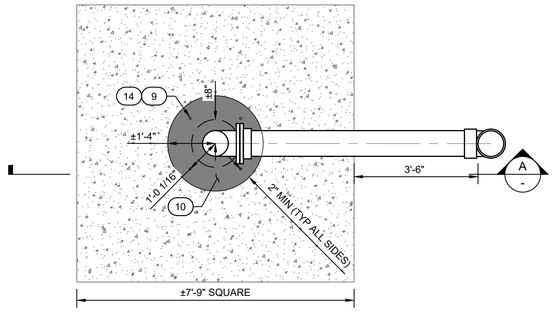
# APPENDIX G
# BOLT PATTERN- DISCHARGE WELL

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5




## A SECTION VIEW

SCALE: 6" = 1'-0"




## INJECTION WELL SITE PLAN

SCALE: 6" = 1'-0"

## DETAIL NOTES:

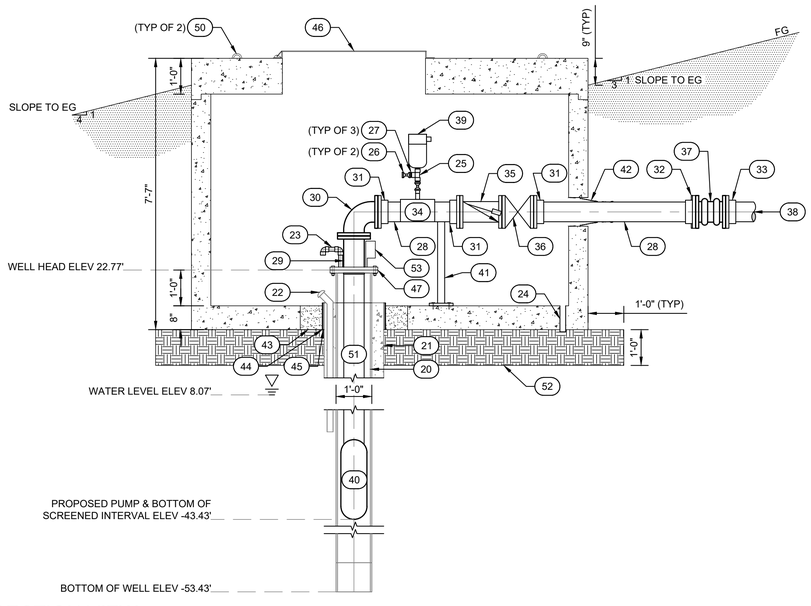
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ALL METAL HARDWARE AND APPURTENANCES SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
3. ALL ABOVEGROUND PVC PIPE, FITTINGS, AND APPURTENANCES SHALL BE COATED PER SPECIFICATION 09 90 00.

## 1 INJECTION WELL ASSEMBLY REHABILITATION

SCALE: 6" = 1'-0"

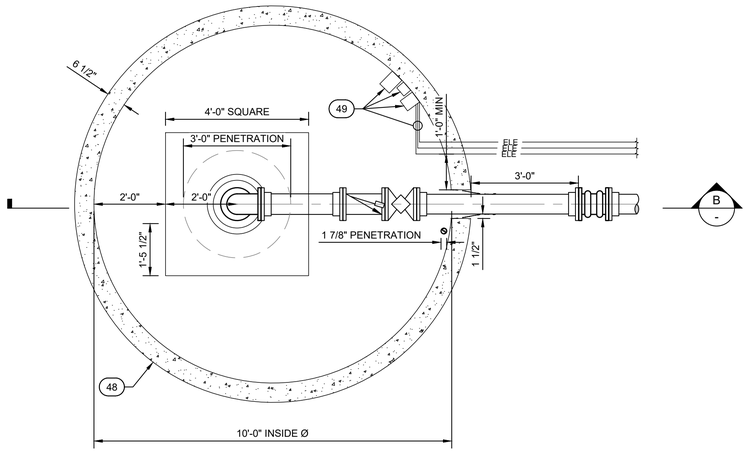
## REFERENCE KEYNOTES

| | |
|---|---|
| XX | DESCRIPTION |
| 1 | 8" SCH 80 SST 316 PIPE, FLG X PE |
| 2 | 8" SCH 80 SST 316 TEE, FLG X FLG X FLG |
| 3 | 8" SCH 80 PVC FLANGE ADAPTER |
| 4 | 8" SCH 80 PVC PIPE |
| 5 | 8" SCH 80 PVC 45-DEGREE ELBOW |
| 6 | 316 STAINLESS STEEL LIFTING EYES, WELDED TO PIPE |
| 7 | 316 STAINLESS STEEL CHIMNEY STYLE VENT CAP, WITH SCREEN. ATTACH PER MANUFACTURER'S RECOMMENDATION |
| 8 | 1/4" FILLET WELD, ALL AROUND |
| 9 | FOUR 1/2" SST 316 ADHESIVE CONCRETE ANCHORS, MINIMUM 6" EMBEDMENT, EQUALLY SPACED AROUND PIPE |
| 10 | 1/2" SST 316 COVER PLATE |
| 11 | EXISTING WELL CASING |
| 12 | EXISTING CONCRETE |
| 13 | COAT PVC PIPE A MINIMUM OF 6" BENEATH GROUND SURFACE |
| 14 | COORDINATE TEMPORARY HATCH COVER, AS SHOWN IN SHEET C-4.3, DETAIL 7, AND REQUIREMENTS OF SPECIFICATION 01 35 00 WITH THE CONSTRUCTION AND BOLT HOLES OF THE STAINLESS STEEL COVER PLATE |
| 15 | 316 SST ADJUSTABLE SADDLE PIPE SUPPORT |




## B SECTION VIEW

SCALE: 6" = 1'-0"




## INTAKE WELL SITE PLAN

SCALE: 6" = 1'-0"

## DETAIL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS
2. ALL METAL HARDWARE AND APPURTENANCES SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
3. REHABILITATE AND FLUSH WELL PRIOR TO WELL HEAD AND PUMP CONSTRUCTION AND INSTALLATION PER SPECIFICATION 01 11 00.
4. WELL ELEVATIONS FROM THE EKI ENVIRONMENT & WATER, REVIEW OF AVAILABLE VIDEO LOGS AND OTHER DATA ON FORMER DESALINATION PLANT WELLS (EKI B6009.23), DATED 1/13/2024. WELL ELEVATIONS ARE SHOWN SCHEMATICALLY FOR REFERENCE ONLY, AND MAY NOT BE TO SCALE.

## 2 INTAKE WELL ASSEMBLY REHABILITATION

SCALE: 6" = 1'-0"

## REFERENCE KEYNOTES

| | |
|---|---|
| XX | DESCRIPTION |
| 20 | EXISTING 12" FRP WELL CASING |
| 21 | EXISTING CONCRETE SEAL |
| 22 | EXISTING 2" GRAVEL FEED TUBE |
| 23 | 1" SCH 80 PVC "CANDY CANE" STYLE VENT |
| 24 | 1" SCH 80 PVC PIPE DRAIN PIPE |
| 25 | 1" 316 SST TEE, THREADED |
| 26 | 1" 316 SST BALL VALVE, THREADED |
| 27 | 1" 316 SST NIPPLE, MNPT X MNPT |
| 28 | 6" SCH 80 PVC PIPE |
| 29 | 6" 316 SST PIPE, FLG X FLG |
| 30 | 6" 316 SST 90-DEGREE BEND, FLG X FLG |
| 31 | 6" PVC FLANGE ADAPTER |
| 32 | 6" PVC VAN STONE FLANGE ADAPTER |
| 33 | 6" HDPE WELD ON FLANGE WITH 316 SST BACKING PLATE |
| 34 | 6" X 1" PVC SADDLE TAP |
| 35 | 6" PVC SWING CHECK VALVE, FLG X FLG |
| 36 | 6" PVC GATE VALVE, FLG X FLG |
| 37 | 6" PROCO UG234L RUBBER EXPANSION JOINT OR APPROVED EQUAL |
| 38 | 6" DR13.5 HDPE PIPE |
| 39 | VAL-MATIC RESILITE COMBINATION AIR VALVE, OR APPROVED EQUAL |
| 40 | SUBMERSIBLE VERTICAL TURBINE PUMP & MOTOR, OFCI |
| 41 | 316 SST ADJUSTABLE SADDLE PIPE SUPPORT |
| 42 | KOR-N-SEAL PIPE BOOT, OR APPROVED EQUAL |
| 43 | NON-SHRINK GROUT |
| 44 | SPLIT PIPE SLEEVE |
| 45 | MIN 1/2" THICK LAYER OF SYNTHETIC RUBBER CAULKING |
| 46 | HATCH PER SHEET C-4.3, DETAIL 6 |
| 47 | FURNISH AND INSTALL 316 SST WELLHEAD FLANGE ATTACHED TO EXISTING CASING FLANGE WITH FLANGED TOP AND THREADED BOTTOM FOR PIPING CONNECTIONS, PER MANUFACTURER'S RECOMMENDATION |
| 48 | POLYMER CONCRETE MANHOLE, INCLUDING BASE AND LID |
| 49 | ELECTRICAL INFRASTRUCTURE SHOWN SCHEMATICALLY FOR REFERENCE ONLY, REFER TO SHEET E-3.0 |
| 50 | 316 SST LIFTING EYES - PER MANUFACTURER'S RECOMMENDATION |
| 51 | 6" 316 SST PIPE, THREADED |
| 52 | SCARIFY AND RE-COMPACT EXISTING SOIL TO A FLAT, LEVEL SURFACE AT 95% RELATIVE COMPACTION, AND PER POLYMER CONCRETE VAULT MANUFACTURER'S RECOMMENDATIONS |
| 53 | 316 SST JUNCTION BOX |

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www.wallacegroup.us

REGISTERED PROFESSIONAL ENGINEER
ZACHARY C. MARKOW
No. 92952
CIVIL
STATE OF CALIFORNIA

SIGNATURE

DATE SIGNED

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MARINA COAST WATER DISTRICT
RESERVATION ROAD DESAL PLANT RENOVATION
CIVIL DETAILS, SHEET 1 OF 3

Know what's below. Call before you dig.

| Rev. | Date | Description of Revisions | By |
|---|---|---|---|
| | | | |
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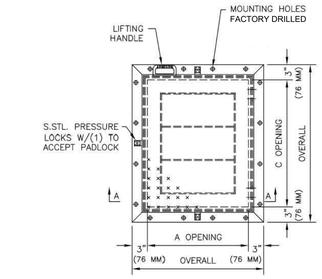
JOB #: 1045-11
DESIGNERS: ZCM
DRAWN BY: LJF
DATE: 11/19/25

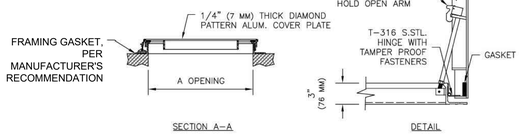
DRAWING NO.
C-4.1
9 OF 18 SHEETS

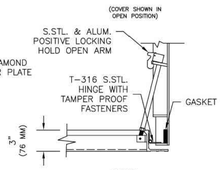
## SERIES F1R ACCESS DOOR

STANDARD FEATURES:

- AUTO–LOCK T–316 STAINLESS STEEL HOLD OPEN ARM WITH RELEASE HANDLE
- TYPE–316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- STAINLESS STEEL PRESSURE LOCKS
- 1/4" (7 MM) NEOPRENE GASKET
- PADLOCK LUG
- SINGLE LEAF CONSTRUCTION
- 625 LBS. PER SQ. FT. LOAD RATING (28 KG. PER SQ. METER LOAD RATING)
- EXTRUDED ALUMINUM FRAME
- LIFETIME GUARANTEE



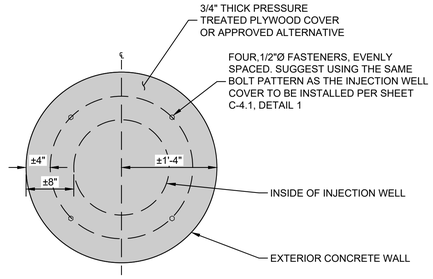

## DETAIL NOTE:

1. CONTRACTOR SHALL KEEP HATCH LOCKED AS REQUIRED IN SPECIFICATION 01 35 00.

| STANDARD SIZES | | | | |
|---|---|---|---|---|
| QTY. | MODEL NO. | A DIM. INCHES (MM) | C DIM. INCHES (MM) | UNIT WT. LBS. (KG.) |
| | F1R2424 | 24 (610) | 24 (610) | 46 (21) |
| | F1R2430 | 24 (610) | 30 (762) | 51 (23) |
| | F1R2436 | 24 (610) | 36 (914) | 61 (28) |
| | F1R2442 | 24 (610) | 42 (1067) | 77 (35) |
| | F1R2448 | 24 (610) | 48 (1219) | 85 (39) |
| | F1R3030 | 30 (762) | 30 (762) | 54 (24) |
| | F1R3036 | 30 (762) | 36 (914) | 69 (31) |
| | F1R3042 | 30 (762) | 42 (1067) | 77 (35) |
| | F1R3048 | 30 (762) | 48 (1219) | 85 (39) |
| | F1R3054 | 30 (762) | 54 (1372) | 99 (45) |
| | F1R3060 | 30 (762) | 60 (1524) | 106 (48) |
| | F1R3636 | 36 (914) | 36 (914) | 70 (32) |
| | F1R3642 | 36 (914) | 42 (1067) | 89 (40) |
| | F1R3648 | 36 (914) | 48 (1219) | 97 (44) |
| | F1R3654 | 36 (914) | 54 (1372) | 107 (49) |
| | F1R3660 | 36 (914) | 60 (1524) | 104 (47) |
| | F1R3666 | 36 (914) | 66 (1676) | 126 (57) |
| | F1R3672 | 36 (914) | 72 (1829) | 135 (61) |
| | 048048MBC | 48 (1219) | 48 (1219) | |
| | | | | |

## 6 NON-TRAFFIC RATED HATCH

SCALE: NTS

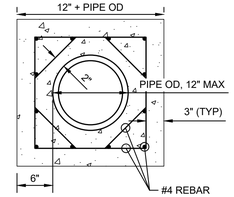



## DETAIL NOTES:

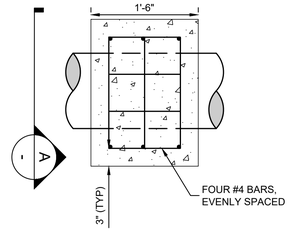
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. COORDINATE TEMPORARY COVER WITH DEMOLITION SHOWN ON SHEET C-1.0, PHOTO DETAIL 4, AND IMPROVEMENTS ON SHEET C-3.1, DETAIL 1.
3. THIS DETAIL IS CONCEPTUAL IN NATURE. CONTRACTOR SHALL ENSURE INJECTION WELL IS SECURED AS OUTLINED IN SPECIFICATION 01 35 00.

## 7 TEMPORARY HATCH COVER CONCEPT

SCALE: 1" = 1'




SECTION VIEW




PLAN VIEW

## 8 CONCRETE PIPE COLLAR

SCALE: 1" = 1'

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REGISTERED PROFESSIONAL ENGINEER
ZACHARY C. MARKOW
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SIGNATURE

DATE SIGNED

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| Rev. | Date | Description of Revisions | By |
|---|---|---|---|
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MARINA COAST WATER DISTRICT
RESERVATION ROAD DESAL PLANT RENOVATION
CIVIL DETAILS, SHEET 3 OF 3

JOB #: 1045-11
DESIGNERS: ZCM
DRAWN BY: LJF
DATE: 11/19/25

DRAWING NO.
C-4.3
11 OF 18 SHEETS

**SECTION 33 05 23**

**STAINLESS STEEL UTILITY PIPE AND TUBING**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes materials, installation, and testing of stainless steel pipe.

1.02 APPLICATION

A. Below and aboveground pressurized piping.

1.03 REFERENCE STANDARDS

A. ASME B36.19 – “Stainless Steel Pipe”

B. ASTM A182 – “Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service”

C. ASTM A312 – “Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes”

D. ASTM A403 – “Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings”

E. ASTM A733 – “Standard Specification for Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples”

1.04 SUBMITTALS

A. All submittals for review and approval shall be made in accordance with Section 01 33 00, Submittal Procedures.

B. Submit the product data sheets for the pipe, fittings, gaskets, and relevant appurtenances

1.05 DELIVERY, STORAGE AND HANDLING

A. General. Pipe shall at all times be handled with equipment designed to prevent damage to the pipeline, and interior and exterior coating of the pipeline, if applicable. Hammering or otherwise means of impact to pipe walls shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the pipe.

C. Unloading. Unloading from the trucks shall be done with care using slings. No pipe shall be allowed to fall from trucks. Pipe shall only be unloaded using a crane or fork lift.

D. Gaskets. Gaskets shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

## PART 2 - MATERIALS

2.01 316 STAINLESS STEEL PIPE

A. Construction
1. Pipe shall conform to ASME B36.19
   a. Pipe shall be Schedule 40S, unless otherwise noted
   b. Pipe shall have a minimum working pressure of 150 PSI, unless otherwise noted.
2. Pipe shall be per ASTM A312

B. Connections
1. Threaded
   a. Per ASTM A182
2. Flanged
   a. Forged or rolled Flanges per ASTM A403, of same material as pipe.
   b. Flanges shall be rated to a minimum of 150 PSI, unless otherwise noted.
3. Gaskets
   a. Gaskets for flanged joints shall be 1/8 inch thick EPDM.
   b. Shall be NSF-61 rated
   c. Pressure rating shall meet or exceed the pressure rating of the pipe or the indicated design pressure at 180°F
4. Nipples
   a. Pipe Nipples shall be per ASTM A733
5. Fittings
   a. Per ASTM A403

## PART 3 - EXECUTION

3.01 GENERAL

A. The contractor shall install all the pipe, closure sections, fittings, valves, and appurtenances shown including pipe supports, bolts, nuts, gaskets, and jointing materials.

B. At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent the entrance of animals and foreign materials. The contractor shall maintain the inside of the pipe clean, sanitary, and free from foreign materials until its acceptance by the District.

C. Where closure sections are required by the contractor's installation operations, the sections shall be installed in accordance with the applicable sections of these specifications.

D. The pipe sections shall be laid in the trench to true alignment and grade in accordance with the drawings. The pipe grade shall be approved by the District.

3.02 TESTING

A. All installed stainless steel piping systems shall be pressure tested to verify the integrity of joints, fittings, and pipe sections.

B. Testing shall be conducted after installation is complete and prior to insulation, backfilling, or commissioning.

C. The hydrostatic test pressure shall be 1.5 times the design operating pressure, but not less than 225 PSI.

D. The test pressure shall be maintained for a minimum of 2 hours.

E. Test pressure shall not drop more than 5 PSIG during the duration of testing.

**END OF SECTION**

**SECTION 33 05 31**

**POLYVINYL CHLORIDE PRESSURE PIPE**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes materials, installation, and testing of polyvinyl chloride (PVC) distribution pipe.

B. SCH 40 & 80 PVC pipe is covered in this specification

C. AWWA C900 PVC pipe is covered in this specification

1.02 APPLICATION

A. Below and aboveground pressurized piping

1.03 REFERENCE STANDARDS

A. ANSI/AWWA C110/A-21.10 – "C110/A21.10-98: American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm), for Water"

B. ANSI/AWWA C153/A21-53 – "Ductile-Iron Compact Fittings"

C. ANSI B16.21 – "Nonmetallic Flat Gaskets for Pipe Flanges"

D. ASTM D1785 – "Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120".

E. ASTM D2564 – "Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems".

1.04 SUBMITTALS

A. All submittals for review and approval shall be made in accordance with Section 01 33 00, Submittal Procedures.

B. Submit the product data sheets for the pipe, fittings, gaskets, and relevant appurtenances

C. For solvent welded pipe, submit product data sheets for the solvent cement

1.05 DELIVERY, STORAGE AND HANDLING

A. General. Pipe shall at all times be handled with equipment designed to prevent damage to the pipeline, and interior and exterior coating of the pipeline, if applicable. Hammering or otherwise means of impact to pipe walls shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the pipe.

C. Unloading. Unloading from the trucks shall be done with care using slings. No pipe shall be allowed to fall from trucks. Pipe shall only be unloaded using a crane or fork lift.

D. Gaskets. Gaskets shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

## PART 2 - MATERIALS

2.01 SCH 40 & 80 PVC PIPE AND FITTINGS

A. PVC pipe and fittings materials shall conform to:
1. ASTM D1784
2. Cell Class 12454
3. NSF 61
4. Pipe shall be virgin rigid PVC

B. PVC pipe shall be marked with a minimum of the following:
1. Manufacturer's Name or Trademark
2. ASTM standard
3. Nominal pipe diameter
4. Wall thickness schedule
5. Material and cell class

C. PVC Pipe Wall Thickness shall be Schedule 80, unless otherwise shown or specified.

D. Laying lengths shall be 20 feet, with the manufacturer's option to supply up to 15% random lengths.

E. PVC pipe where above ground and exposed to sunlight, or within a vault, shall be coated per Specification 09 90 00 – Painting and Coating.

F. Approved Manufacturers
1. Spears Manufacturing Company,
2. J.M. Eagle, Inc.,
3. North American Pipe Corporation / Westlake Chemical,
4. Or approved equal

2.02 SCH 40 & 80 PVC PIPE JOINTS

A. Joints
1. Joints, unless otherwise shown, shall be solvent-welded socket joint.
2. Provide threaded or flanged adaptors as required for valve connections

B. Solvent Cement
1. Use ASTM D656 primer
2. Use ASTM D2564 solvent cement

3. Solvent cement shall be NSF-61 rated
4. Solvent cement shall be rated for the PVC pipe/fitting diameter and schedule
5. Approved Manufacturers:
    a. Weld-On,
    b. Oatey,
    c. Or approved equal.

C. Flanges
1. Flanges shall be plain-faced 150 psi flanges with hole spacing per ANSI B16.5.
2. Unless otherwise shown, flange adapters for PVC pipe shall be Schedule 80 PVC Socket Van Stone Ring Flange type.

D. Gaskets
1. Full-faced elastomer
2. Have a minimum working pressure rating of 150 psi at 120°F
3. Shall conform to ANSI B16.21

E. Bolts, Nuts, Washers, and Metallic Appurtenances
1. All metal bolts, nuts, washers, and components shall be [304] [316] stainless steel.

2.03 C900 PVC PIPE

A. Construction:
1. Pipe shall be manufactured in accordance to AWWA C900, and shall be of the sizes and pressure classes as shown on the plans
    a. Unless otherwise noted pipe shall be DR21 or thicker walled (lower DR).
2. Pipe shall have a gasketed bell end or plain end with elastomeric gasketed coupling
3. Pipe and couplings shall be made Class 12454-A or B virgin compounds as outlined in ASTM 1785

B. Pipe Lengths:
1. Laying lengths shall be 20 feet with the manufacturer's option to supply up to 15% random lengths.

C. Pipe Marking:
1. Each pipe length shall be marked with the following:
    a. Date of Manufacture
    b. Nominal pipe size
    c. Outside Diameter
    d. AWWA DR rating
    e. AWWA C900 designation

D. Manufacturers
1. JM Eagle
2. Diamond Plastics Corporation
3. Vinyltech Corporation
4. Or approved equal

E. Fittings:
   1. Bell Sizes shall match the DR rating of the pipe, including the rubber-ring retaining groove
   2. Fittings shall be ductile iron conforming to ANSI/AWWA C110/A-21.10 or ANSI/AWWA C153/A21-53
   3. Ductile iron fittings shall be restrained joints, and one of the following:
      a. Flanged fittings
      b. Manufactured with locking restraint pipe fittings
         1) Manufacturers
            a) TR-Flex – U.S. Pipe & Foundary Company
            b) Flex Ring – American Cast Iron Pipe
            c) Or approved equal
      c. Mechanical joints with mechanical joint restraints
   4. Gaskets
      a. Gaskets for flanged joints shall be 1/8 inch thick EPDM.
      b. Shall be NSF-61 rated
      c. Pressure rating shall meet or exceed the pressure rating of the pipe at 180°F

## PART 3 - EXECUTION

3.01 GENERAL

A. The contractor shall install all the pipe, closure sections, fittings, valves, and appurtenances shown including pipe supports, bolts, nuts, gaskets, and jointing materials.

B. At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent the entrance of animals and foreign materials. The contractor shall maintain the inside of the pipe clean, sanitary, and free from foreign materials until its acceptance by the District.

C. Where closure sections are required by the contractor's installation operations, the sections shall be installed in accordance with the applicable sections of these specifications.

D. The pipe sections shall be laid in the trench to true alignment and grade in accordance with the drawings. The pipe grade shall be approved by the District.

E. The pipe shall not be laid along curves at a radius less than that listed below:

The minimum-radius curves are determined by the limit of 2-degree deflection for PVC pipe joints with factory-assembled bell couplings:

| Length of Pipe Section | Minimum Curve Radius |
|---|---|
| 20 feet | 573 feet |
| 10 feet | 287 feet |

F. For curves of smaller radius, use high-deflection couplings or ductile-iron fittings.

3.02 PRESSURE AND LEAKAGE TESTS:

1. Conduct hydrostatic pressure testing of installed polyethylene pipe in accordance with ASTM F2164.
2. For HDPE pipe, fill the pipe slowly ensuring fill rate does not exceed the capacity of air release devices. Once air has been expelled from the system, gradually increase the pressure to 160 psi. Add makeup water as necessary to maintain this pressure for four (4) hours.
3. After the four (4) hour test period, reduce the pressure main to the 150 psi test pressure and monitor for one (1) hour. Do not increase pressure or add makeup water during this test period.
4. The test is passed and considered acceptable if the main pressure does not drop more than 5% (7.5 psi) during the one (1) hour test period.
5. If any defects or leaks are revealed, Contractor shall correct the leaks and retest the pipeline after a minimum 24-hour recuperation period.
6. Total testing conducted on a single, continuous section of pipeline shall not exceed eight hours within a 24-hour period.

3.03

**END OF SECTION**

**SECTION 33 05 33**

**POLYETHYLENE UTILITY PIPE**

## PART 1 - GENERAL

1.01 SCOPE

A. This section includes requirements and performance criteria for solid wall high density polyethylene pipe (HDPE) and fittings which shall conform to AWWA, ASTM, and other referenced documents.

1.02 QUALIFICATION REQUIREMENTS

A. Manufacturer Requirements: Manufacturer shall have a minimum of five (5) years recent experience producing HDPE pressure pipe and fittings for at least the specified sizes and lengths shown in the Plans, and shall be able to submit documentation of at least five (5) installations in satisfactory operation for at least five (5) years.
   1. Approved Manufacturers:
      a. J.M. Eagle, Inc.,
      b. North American Pipe Corporation / Westlake Chemical,
      c. Or approved equal

B. Contractor Requirements: Contractor shall have a minimum of five (5) years recent experience installing HDPE pressure pipe and fittings for at least the specified sizes and lengths shown in the Plans, and shall be able to submit documentation of at least five (5) installations in satisfactory operation for at least five (5) years.

C. All HDPE pipe and fittings, including linings and coatings, that will convey potable water or water that will be treated to become potable, shall be certified by an accredited organization in accordance with NSF 61 as being suitable for contact with potable water.

D. All pipe and fittings of each material type shall be furnished by the same manufacturer.

1.03 APPLICATION

A. Below and aboveground pressurized piping

1.04 REFERENCE STANDARDS

A. American Water Works Association (AWWA), latest edition:
   1. AWWA C901 - Polyethylene Pressure Pipe and Tubing, ½ Inch Through 3 Inch for Water Service
   2. AWWA C906 - Polyethylene Pressure Pipe and Fittings, 4 Inch Through 65 Inch for Water Distribution and Transmission

B. American Society for Testing and Materials (ASTM), latest edition:
   1. ASTM D638 – Tensile Method for Tensile Properties of Plastics

2. ASTM D790 – Test Materials for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
3. ASTM D-882 – Standard Test Method for Tensile Properties of Thin Plastic Sheeting
4. ASTM D2122 – Standard Method of Determining Dimensions of Thermoplastics Pipe and Fittings
5. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
6. ASTM D2657 – Practice for Heat-Joining of Polyolefin Pipe and Fittings
7. ASTM D2683 – Standard Specification for Socket Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
8. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping
9. ASTM D2837 – Standard Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
10. ASTM D3035 – Polyethylene (PE) Plastic Pipe (DR-PE) Based on Controlled Outside Diameter
11. ASTM D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
12. ASTM D3350 – Polyethylene Plastic Pipe and Fittings Material
13. ASTM F412 – Standard Terminology Relating to Plastic Piping Systems
14. ASTM F714 – Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
15. ASTM F905 – Standard Practice for Qualification of Polyethylene Saddle-Fused Joints
16. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
17. ASTM F1056 – Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings
18. ASTM F1290 – Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
19. ASTM F2164 – Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
20. ASTM F2206 – Fabricated Fittings for Butt-Fused Polyethylene Plastic Pipe
21. ASTM F2620 – Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
22. ASTM F2786 – Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Gaseous Testing Media Under Pressure (Pneumatic Leak Testing)
23. ASTM F3124 – Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints
24. ASTM F3190 – Standard Practice for Heat Fusion Equipment (HFE) Operator Qualifications on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings

C. Plastics Pipe Institute (PPI) latest edition:
1. The PPI Handbook of Polyethylene Pipe
2. PPI – TN-36 – General Guidelines for Connecting HDPE Potable Water Pressure Pipes to DI and PVC Piping Systems
3. PPI – TN-38 – Bolt Torque for Polyethylene Flanged Joints

4. PPI – TN-44 – Long Term Resistance of AWWA C906 Polyethylene (PE) Pipe to Potable Water Disinfectants
5. PPI – TN-45 – Mechanical Couplings for Joining Polyethylene Pipe
6. PPI – TN-46 – Guidance for Field Hydrostatic Testing of High Density Polyethylene Pressure Pipelines: Owner's Considerations, Planning, Procedures, and Checklists
7. PPI – TN-49 – Recommendations for AWWA C901 Service Tubes in Potable Water Applications
8. PPI – TN-54 – General Guidelines for Squeezing Off Polyethylene Pipe in Water, Oil and Gas Applications

D. Plastics Pipe Institute Municipal Advisory Board (MAB)
1. MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Smaller Polyethylene Pipe
2. MAB Generic Electrofusion Procedure for Field Joining of 14 Inch to 30 Inch Polyethylene Pipe
3. MAB Model Specifications for PE 4710 Buried Potable Water Service, Distribution, and Transmission Pipe and Fittings

1.05 SUBMITTALS

A. All submittals for review and approval shall be made in accordance with Section 01 33 00, Submittal Procedures.

B. Contractor shall submit information detailing the manufacturer's experience requirements to satisfy the requirements of Paragraph 1.02 of this Specification.

C. Contractor shall submit pipe catalog information confirming that pipe, fittings, joints, and other materials conform to the requirements of this Specification.

D. The HDPE utility pipe and fitting manufacturer shall provide all Shop Drawings and other submittals for all components furnished. Contractor shall submit all Shop Drawings to Owner and Owner's Representative.

E. Submit manufacturer's recommended fusion procedures for all products.

1.06 DELIVERY, STORAGE AND HANDLING

A. General. Pipe shall at all times be handled with equipment designed to prevent damage to the pipeline, and interior and exterior coating of the pipeline, if applicable. Hammering or otherwise means of impact to pipe walls shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the pipe.

C. Unloading. Unloading from the trucks shall be done with care using slings. No pipe shall be allowed to fall from trucks. Pipe shall only be unloaded using a crane or fork lift.

D. Gaskets. Gaskets shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.07 WARRANTY

A. Unless otherwise specified, all pipe shall be warrantied for one year per the pipe suppliers' standard terms.

## PART 2 - MATERIALS

2.01 POLYETHYLENE PIPE, FITTINGS, AND ACCESSORIES

A. Unless approved otherwise by the Engineer, all HDPE pipe shall be made from PE materials with standard material designation code PE4710, in compliance with AWWA C906 and all associated ASTM standards. All HDPE pipe shall be minimum DR 11, plain-end type.

B. Joints:
   1. Butt-fusion welded per AWWA C906, AWWA M55, and all associated ASTM standards, or
   2. Electrofusion couplers in compliance with AWWA C906.

C. Fittings: All fittings, unless otherwise shown, shall be made of HDPE material with a minimum material designation code of PE4710 and shall have a pressure rating equal to the pipe. All fittings shall meet the requirements of AWWA C901, C906, and all applicable ASTM standards.
   1. Butt-Fusion Fittings: Molded and fabricated butt-fusion fittings shall be marked in accordance with ASTM D3261 and ASTM F2206, respectively. Socket fittings shall meet ASTM D2683.
      a. Fabricated fittings shall be manufactured using a Data Logger to record, at a minimum, fusion time, pressure, and temperature. A graphic representation of the data produced during the fabrication of fittings shall be maintained for a minimum of five years as part of the quality control and will be made available upon request of the Owner.
      b. Fabricated fittings shall be marked with a unique joint identifier that corresponds to the joint report.
   2. Electrofusion Fittings: shall meet all requirements of ASTM F1055.
   3. Branch Saddles and Tapping Tees:
      a. If saddle fusion is used to fuse branch saddles, tapping tees, and other HDPE fittings onto the wall of the main pipe, it shall be done in accordance with ASTM F2620, PPI TR-41, or the fitting manufacturer's recommendations. Saddle fusion joints shall be made by qualified fusion technicians.
      b. If socket fusion is used to fuse branch saddles, tapping tees, and other HDPE fittings onto the wall of the main pipe, it shall be done in accordance with ASTM D2683 or the fitting manufacturer's recommendations. Socket fusion joints shall be made by qualified fusion technicians.

D. Flanges and Mechanical Joint Adapters (MJ) shall have a minimum material designation code of PE4710 and meet all applicable AWWA and ASTM standards. Flanged and MJ adapters can be made to ASTM D3261 or machined in compliance with ASTM F2206. Flanges and MJ adapters shall have a pressure rating equal to the

pipe unless otherwise specified on the plans. Markings for molded or machined flange adapters or MJ adapters shall be per ASTM D3261. Fabricated (including machined) flange adapters shall be marked per ASTM F2206. Installation of all Flanged adapters shall follow the guidelines of the Plastics Pipe Institute TN-38.

1. Backing rings shall be included with all flanged adapters. Backing rings shall be constructed from 316 Stainless Steel or 304 Stainless Steel.

E. Glands, bolts, and gaskets shall be manufactured in accordance with AWWA C153. Bolts and nuts shall be grade 2 or higher.

F. Pipe color: Black.

2.02 DATA LOGGER

A. A data logger shall be used to record and document all butt fusion processes. The data logger must be compatible and outfitted with an electronic data recording device.

B. Joint Report: A digital report or printout for all fusion joints made that complies with, but is not limited to, ASTM F3124 shall be delivered to the Owner upon request and at the completion of the project. Data collected by the data logger and included in the report shall include, at a minimum:

1. Joint ID,
2. Operator Name and ID,
3. Nominal pipe size and pressure rating
4. Fusion time, pressure, and temperature
5. Heater plate temperature

C. Recording Unit:

1. McElroy Manufacturing, Inc DataLogger 6, or approved equivalent.

2.03 FLANGES

A. All flanges shall conform to AWWA C207 Class D or ANSI B16.1 Class 150. Bolt holes in all flanges shall straddle the field vertical centerline.

2.04 TRACER WIRE

A. Tracer wire shall be insulated, stranded, AWG 10-gauge wire.

2.05 WARNING TAPE. All buried “wet” piping shall be provided with warning tape, of pigmented polyolefin material, which is chemically inert and will not degrade upon contact with moist soil. Tape shall have tensile strength of 2,500 psi and elongation of 800% per ASTM D-882. Tape shall be 3" wide, Marked “CAUTION BURIED PIPELINE BELOW”,

A. Manufacturers:

1. Terra-Tape
2. Empire Underground Utility Tape
3. Or approved equal

2.06 POLYETHYLENE ENCASEMENT

All buried underground carbon steel or ductile iron fittings, couplers, adapters, and all valves buried underground shall be encased with loose polyethylene film unless otherwise stated on the plans or in these specifications.

A. Loose polyethylene film encasement shall be not less than 10 mils thick, and shall be applied per the requirements of the latest revised Standard of ANSI/AWWA C 105/A21.5 entitled, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids," shall be closely followed.

B. Pipe wrap tape, 10 mil minimum, duct tape or equivalent, not less than 2" wide shall be used to secure the polyethylene film. Tape shall extend around the pipe at least twice at each end of the piece of film being installed.

**PART 3 - EXECUTION**

3.01 PIPE JOINING

A. HDPE pipe shall be heat-fused and pressure tested as per manufacturer's guidelines. During assembly and prior to installation, pipe must be laid out in such a way as to minimize interference to pedestrian and vehicular traffic.

B. Cuts or gouges that reduce the wall thickness by more than 10% are not acceptable and must be cut out, discarded, and the pipe rejoined.

C. Each butt fusion weld shall be recorded and logged by a data logger affixed to the fusion machine. Joint data shall be compiled into a Joint Report and submitted as part of the as-built documentation.

D. Mechanical Joining: HDPE pipe and fittings may be joined together or to other materials by means of flanged connections or mechanical couplings designed for joining polyethylene pipe, or for joining polyethylene pipe to another pipe material. Mechanical couplings shall be fully pressure rated and fully thrust restrained and installed in accordance with manufacturer's recommendations.

E. Restrained Joint Adapters:

1. Restrained joint adapters shall be installed where shown in the Plans and in accordance with the manufacturer's instructions.

2. When used underground, the joint adapter shall be wrapped with 10 mil polyethylene. Ends of wrap shall be taped, three (3) layers minimum, with 10 mil pipe wrap tape.

3.02 TRENCH CONSTRUCTION

A. Comply with trench detail shown on the Plans and with the requirements of Section 31 23 33, Trenching and Backfilling.

3.03 PIPE LAYING

A. Install in accordance with the latest version of AWWA C906, AWWA M55, and associated standards, and to the grade and invert elevations shown on the plans.

B. Allow on-site visual inspection by Owner or Owner's Representative of all piping prior to backfilling, upon request.

C. Temporary Plugs: when, for any reason, pipe laying is discontinued for an hour or more, the open end of each line shall be closed with a close-fitting stopper.

3.04 WARNING TAPE

A. Warning tape shall be placed in the trench with the piping, as shown in the plans. All splices shall be made by tying ends of tape together. The tape shall be placed at depth of cover and distance above pipe crown as shown in the Plans.

3.05 TRACER WIRE

A. Tracer wire shall be placed on top of pipe per standard trench detail shown in Plans.
   1. Where valve boxes exist, pull wire into each valve box and terminate with wire nuts.
   2. Where valve boxes do not exist, extend wire above ground surface or concrete pad by 6 inches, and terminate with a wire nut. Affix loose end of wire to exposed pipe using tape wrap.
      a. Tape wrap shall be cold-applied tape wrap per AWWA C209

3.06 TESTING

A. Pressure and Leakage Tests:
   1. Conduct hydrostatic pressure testing of installed polyethylene pipe in accordance with ASTM F2164.
   2. For HDPE pipe, fill the pipe slowly ensuring fill rate does not exceed the capacity of air release devices. Once air has been expelled from the system, gradually increase the pressure to 150 psi, measured at the lowest point in the pipeline. Add makeup water as necessary to maintain this pressure for four (4) hours.
   3. After the four (4) hour test period, reduce the pressure main to the 140 psi test pressure and monitor for one (1) hour. Do not increase pressure or add makeup water during this test period.
   4. The test is passed and considered acceptable if the main pressure does not drop more than 5% (7.5 psi) during the one (1) hour test period.
   5. If any defects or leaks are revealed, Contractor shall correct the leaks and retest the pipeline after a minimum 24-hour recuperation period.
   6. Total testing conducted on a single, continuous section of pipeline shall not exceed eight hours within a 24-hour period.

**END OF SECTION**

**SECTION 33 16 01**

**DOUBLE-BALL EXPANSION JOINT**

## PART 1 GENERAL

1.01 GENERAL

A. This section specifies the double-ball flexible expansion joint installed at the locations shown in the drawings.

B. Submittals: Submit the following in accordance with Section 01 33 00 of these Specifications:

1. Catalog sheets of the proposed joint to be used, demonstrating compliance with all provisions of this specification section.
2. Foundry certification of material.
3. Certified test report verifying expansion joint factory pressure test.
4. Certification of Factory Mutual approval.

## PART 2 PRODUCTS

2.01 DOUBLE-BALL EXPANSION JOINTS

A. Approved Manufacturers: EBAA Iron, Inc. Force Balanced FLEX-TEND Model 4406F20B, or approved equal.

B. Flexible expansion joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material requirements of ASTM A536 and ANSI/AWWA C153/A21.53. Foundry certification of material shall be readily available upon request.

C. Joints to adjoin to mating pipe shall be flanged per Section 33 00 00 of these Specifications, in accordance with AWWA C-110.

D. Each flexible expansion joint shall be pressure tested prior to shipment against its own restraint to a minimum of 350 psi. A minimum 2:1 safety factor, determined from the published pressure rating, shall apply. Factory Mutual Approval for the 3 inch through 12 inch sizes is required.

E. Each flexible expansion joint shall consist of an expansion joint designed and cast as an integral part of a ball and socket type flexible joint, having a minimum per ball deflection of:

1. 20º for sizes 2” - 12”;
2. 15º for sizes 14” - 36”;

3. 12º for sizes above 36";

4. and 4-inches minimum expansion.

F. Connection shall be standardized mechanical joint or flange end connections as shown on the drawings.

G. Interior Lining - All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion-bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213 and ANSI/NSF-61, and shall be holiday tested with a 1,500 volt spark test in conformance with ANSI/AWWA C213.

H. Exterior surfaces shall be factory coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16. Submit color palette for color choice by Owner, with the technical submittal for this flexible joint.

I. Sealing gaskets - EPDM per ANSI/NSF-61.

2.02 POLYETHYLENE ENCASEMENT

A. Polyethylene pipe wrap in compliance with the requirements of the latest revised edition of AWWA C105.

B. Minimum thickness: 10 mil.

C. Pipe Wrap Tape: 2" wide, 10 mil minimum.

**PART 3 EXECUTION**

3.01 Joint shall be installed in strict accordance with manufacturer's recommendations, and at the location shown on the drawings. Flexible joints come with o-ring seals to ensure water-tight seal. Ensure these o-ring seals are installed per manufacturer's recommendations.

3.02 Isolate flexible joint from any field pressure testing. Do not field pressure test flexible joint.

3.03 All buried double-ball expansion joints shall be encased in polyethylene film in accordance with the requirements of the latest revised edition of AWWA C105.

3.04 Polyethylene film shall be secured with pipe wrap tape. Tape shall extend around the joint at least twice at each end of the piece of film being installed

**END OF SECTION**

**SECTION 33 39 14**

**POLYMER CONCRETE MANHOLES**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. Polymer concrete manholes intended for wellhead vaults where corrosion resistance is required.

1.02 SUBMITTAL

A. In accordance with Section 01 33 00, Submittal Requirements, submit the following:
   1. Submit manufacturer's data and details of following items for approval:
      a. Shop drawings of manhole sections, base units and construction details, jointing methods, materials, and dimensions, and detailing pipe penetrations as shown on the drawings.
      b. Summary of criteria used in manhole design including, as minimum, material properties, loading criteria, and dimensions assumed. Include certification from manufacturer that polymer concrete manhole design meets or exceeds the load and strength requirements of ASTM C 478 and ASTM C 857, reinforced in accordance with ACI 440.1R-15.
      c. Frames, grates, rings, and covers.
      d. Materials to be used for pipe connections.
      e. Materials to be used for stubs and stub plugs.
      f. Proof of independent Chemical Resistance testing conducted in accordance with the Standard Specifications for Public Works Construction (California Greenbook) Section 211-2, latest edition.
      g. Submitted sealed drawings by a registered California Professional Engineer.
      h. Unless otherwise specified, drawings shall also comply with Owner's standard manhole detail for base, channel, and piping penetrations, frame and grate, cover.

1.03 REFERENCE STANDARDS

A. ASTM C 478 (most current) Standard Specification for Precast Reinforced Concrete Manhole Sections

B. ASTM C 579 (most current) Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic, Surfacing, and Polymer Concretes

C. ASTM C 443 (most current) Standard Specification for Joints for Concrete Pipe and Manholes Using Rubber Gaskets

D. ASTM C 580 (most current) Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

E. ASTM C 857 (most current) Standard Practice for Minimum Structural Design Loading for Underground Utility Structures

F. ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures & Commentary

G. ACI 440.1R-15 Guide for the Design and Construction of Structural Concrete Reinforced with Fiber-Reinforced Polymer (FRP) Bars

H. ACI 548.6R-96 Polymer Concrete-Structural Applications State-of-the-Art Report

I. ASTM D 648 (most current) Test Method for Deflection Temperature of Plastics Under Flexural Load in Edgewise Position

J. ASTM D 6783 (most current) Standard Specification for Polymer Concrete Pipe

K. ASTM D 2584 (most current) Test Method for Ignition Loss of Cured Reinforced Resins

L. ASTM C 923 (most current) Standard Specifications for Resilient Connectors between Concrete Manholes Structures and Pipe

M. ASTM C 990 (most current) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections using Preformed Flexible Joint Sealants

N. ASTM C 497 (most current) Test Methods for Concrete Pipe, Manhole Sections, or Tile

O. California Greenbook Standard Specifications for Public Works Construction Section 211-2.

## PART 2 - MATERIALS

A. General:
   1. Provide polymer concrete, unless shown otherwise.
   2. Provide riser sections joined with bell and spigot / ship-lap design seamed with butyl mastic and or rubber gaskets (ASTM C 990) so that on assembly, manhole base and top section make a continuous and uniform manhole structure.
   3. Construct riser sections for polymer concrete manholes from standard polymer concrete manhole sections of the diameter indicated on drawings. Use various lengths of polymer concrete manhole sections in combination to provide correct height with the fewest joints.
   4. Design wall sections for depth and loading conditions with wall thickness as designed by polymer concrete manufacturer.
   5. Provide tops to support AASHTO HS-20 loading or loads as required and receiving cast iron frame covers or hatches, as indicated on drawings. Manhole covers shall be marked "SEWER" and/or as indicated on the drawings.

B. Polymer Concrete manhole risers, cones, flat lids, grade rings and manhole base sections shall be designed by manufacturer to meet the intent of ASTM C 478 with

allowable compositional and sizing differences as designed by the polymer concrete manufacturer.

1. AASHTO HS-20 design or as required loading applied to manhole cover and transition and base slabs.
2. Polymer manholes shall be designed based upon live and dead load criteria in ASTM C 857 and ACI 350-06.
3. Unit soil weight of 120 pcf located above portions of manhole, including base slab projections.
4. Internal liquid pressure based on unit weight of 63 pcf.
5. Dead load of manhole sections fully supported by polymer concrete and conventional concrete manhole bases.

C. Polymer Concrete Manhole risers, flat lids, and manhole base sections shall be designed by manufacturer to meet loading requirements of ASTM C 478, ASTM C 857 and ACI 350-06 as modified for polymer concrete manhole design as follows:

1. Polymer Concrete Mix Design shall consist of thermosetting resin, sand, and aggregate. No Portland cement shall be allowed as part of the mix design matrix. All sand and aggregate shall be inert in an acidic environment.
2. Reinforcement – Shall use acid resistant reinforcement (FRP Bar) in accordance with ACI 440.1R-06 as applicable for polymer concrete design.
3. The wall thickness of polymer concrete structures shall not be less than that prescribed by the manufacturer's design by less than 95% of stated design thickness.
4. Thermosetting Resin - The resin shall have a minimum deflection temperature of 158° F when tested at 264 psi (1.820 mPa) following Test Method D 648. The resin content shall not be less than 7% of the weight of the sample as determined by test method D 2584. Resin selection shall be suitable for applications in the corrosive conditions to which the polymer concrete manhole structures will be exposed.
5. Each polymer concrete manhole component shall be free of all defects, including indentations, cracks, foreign inclusions and resin starved areas that, due to their nature and degree or extent, detrimentally affect the strength and serviceability of the component part. Cosmetic defect shall not be cause for rejection. The nominal internal diameter of manhole components shall not vary more than 2%. Variations in height of two opposite sides of risers and cones shall not be more the 5/8 inch. The under run in height of a riser or cone shall not be more than ¼ in/ft of height with a maximum of ½ inch in any one section.
6. Marking and Identification - Each manhole shall be marked with the following information - Manufacturer's name or trademark, Manufacturer's location and Production Date.
7. Manhole joints shall be assembled with a bell/spigot or shiplap butyl mastic and/or gasketed joint so that on assembly, manhole base, riser and top section make a continuous and uniform manhole. Joint sealing surfaces shall be free of dents, gouges and other surface irregularities that would affect joint integrity.
8. Minimum clearance between wall penetrations and joints shall be per manufacturer's design.
9. Construct invert channels to provide smooth flow transition with minimal disruption of flow at pipe-manhole connections. Invert slope through manhole is as indicated on drawings. All precast base sections to be cast monolithically. Polymer bench and channel are to be constructed with all polymer concrete

material. Extended ballast slab requirements for buoyancy concerns, where specified, shall be addressed with cementitious concrete material.

10. Provide resilient connectors conforming to requirements of ASTM C 923 or other options as available. All connectors are to be water tight. Install approved resilient connectors at each pipe entering and exiting manholes in accordance with manufacturer's instructions.

2.02 GROUTING

A. All materials needed for grouting and patching will be a polyester mortar compound provided by the manufacturer or an approved equal by the manufacturer.

2.03 MANUFACTURERS

A. Armorock Polymer Concrete

B. US Composite Pipe, Inc.

C. Or approved equal

**PART 3 - EXECUTION**

3.01 WARRANTY

A. Contractor shall guarantee the polymer concrete manhole structures against defective materials and workmanship for a period of one year from the date of substantial completion. If any materials or workmanship prove to be defective within one year, they shall be replaced or repaired by the Contractor at no additional cost to Owner.

3.02 DELIVERY, STORAGE AND HANDLING

A. Schedule delivery of products as required to allow timely installation and to avoid prolonged storage at the site. Coordinate with Owner's Representative for on-site storage of all building materials for the job.

B. Provide appropriate personnel and equipment to receive deliveries. Notify Owner and Owner's Representative of expected arrival date/time of materials, to allow Owner opportunity to inspect materials delivered. Contractor shall be responsible for ensuring all delivered products are un-damaged and in new condition. Owner will not accept damaged materials on-site.

3.03 GENERAL

A. Install polymer concrete manholes in accordance with manufacturer recommendations.

B. Existing and New Pipe Inverts. Pipe inverts are shown on the drawings. Existing inverts are shown as reasonably accurate as possible based on field survey of inverts at existing manholes. Contractor shall confirm invert elevations at tie-ins and new manhole locations, and shall adjust new sewer inverts (incoming or outgoing) to provide adequate fall/drop across the manhole base as shown on the drawings (0.1

feet minimum). Contractor shall notify Owner of any anomalies or unanticipated field conditions and elevations that could affect proper setting of sewer inverts and manhole base slopes.

C. Manhole Rim Elevations. Unless otherwise shown or specified, sewer manhole rims in street/paved areas shall be as indicated on the drawings, and flush with finished surface. In areas outside of paved areas, rim elevations shall be raised a minimum of 3 inches above existing and finished grades to minimize the risk of inflow, and also to prevent manhole lid from being covered with dirt and debris over time.

D. Protect in Place. Conduct all work in a manner so as not to damage existing infrastructure adjacent to new Work.

E. Structure shall be placed level. Manholes shall be placed on a minimum of 12" of crushed gravel or aggregate base, compacted to 95 percent, unless otherwise noted in the contract documents.

F. Excavation and backfill shall be in accordance with Section 31 00 00 Earthwork. Backfill with select backfill unless shown otherwise on the drawings.

**END OF SECTION**

**SECTION 40 05 00**

**COMMON WORK RESULTS FOR PROCESS INTERCONNECTIONS**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes materials, testing, and installation of manually operated process valves and miscellaneous appurtenances for process integration. This section includes:
   1. Butterfly Valves
   2. Ball Valves
   3. Gate Valves
   4. Air & Vacuum Valves
   5. Rubber Expansion Joints

1.02 REFERENCES

A. ANSI B-16.1 – “Cast Iron Pipe Flanges and Flanged Fittings”

B. ASTM A126 – “Gray Iron Castings for Valves, Flanges and Pipe Fittings”

C. ASTM A276 – “Standard Specification for Stainless Steel Bars and Shapes”

D. ASTM A351 – “Standard Specification for Castings, Austenitic, for Pressure-Containing Parts”

E. ASTM A536 – “Standard Specification for Ductile Iron Castings”

F. ASTM D412 – “Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension”

G. ASTM D1784 – “Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds”

H. ASTM D2000 – “Standard Classification System for Rubber Products in Automotive Applications”

I. ASME B16.1 – "Pipe Flanges and Flanged Fittings"

J. AWWA C111 – “Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings”

K. AWWA C504 – “AWWA Standard for Rubber-Seated Butterfly Valves”

L. AWWA C512 – “AWWA C512-15 Air-Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service”

M. MSS-SP-110 – “Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends”

N. NSF/ANSI 61 – “Drinking Water System Components - Health Effects”

O. NSF/ANSI 372 – “Drinking Water System Components - Lead Content”

1.03 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00:
   1. Manufacturer's catalog data and detail construction sheets showing all parts and describing material of construction by material and specification (such as AISI, ASTM, SAE, or CDA), demonstrating compliance with this Section.
   2. Complete shop drawings including dimensions, laying lengths, and recommended installation orientations.
   3. Certification that all linings and coating products are suitable for contact with drinking water in accordance with NSF Standard 61.
   4. Copy of certified hydrostatic shell tests and seat tests at the factory, as applicable.

1.04 WARRANTY

A. General: All valves and other equipment described herein shall be warranted by the manufacturer for defects in materials and workmanship for a period of at least one year (12 months) from date of substantial completion.

1.05 ENVIRONMENT

A. The project is located in a maritime environment. Salt is expected in the air, and the raw intake water is expected to be similar to seawater, with approximately 19,000 mg/L of Chloride, approximately 35 parts per thousand salinity, and an average annual temperature of 50°F to 64°F.

**PART 2 PRODUCTS**

2.01 BUTTERFLY VALVES – FLANGED

A. Service: Aboveground Raw Water, Aboveground Brine Water, Buried Brine Water

B. Construction:
   1. Short body, flanged type, conforming to AWWA C504
   2. Valve body shall be ductile iron, ASTM A536, Grade 65-45-12
   3. Flanges shall be per ANSI B-16.1, unless otherwise noted
   4. Valve shafts shall be 304 or 316 stainless steel
   5. Exposed body cap screws, bolts & nuts, squeeze pins shall be 316 stainless steel
   6. Disc shall be 316 stainless steel
   7. Valve seat shall be EPDM rubber in accordance with ASTM D412
   8. O-Rings shall be a synthetic rubber per ASTM D2000.
   9. Pressure Class: Class 150
   10. Unless otherwise noted, the minimum working differential pressure across the valve disc shall be 150 PSI
   11. Valve shall have a lever handle that is a 10-position lockable handle
   12. Where valve is underground, provide operating nut. Provide a valve stem as required by contract drawings
   13. Valve shall conform to NSF-61

C. Manufacturers:
1. Dezurik BAW
2. Muller Lineseal
3. Pratt Groundhog
4. Or approved equal

2.02 BALL VALVES – THREADED (1/4 INCH TO 2 INCH)

A. Service: Raw Water

B. Construction:
1. Stainless steel body, ASTM A351-CF8M, two-piece full port type,
2. Stainless steel ball and stem, ASTM A276-316
3. Reinforced TFE seats and packing
4. Blow-out proof stem design
5. Ends shall be FNPT unless otherwise shown on the contract drawings
6. Provide stainless steel padlocking lever and nut
7. Shall conform to MSS-SP-110 and be pressure rated to 200 PSIG, CWP.
8. Valve shall conform to NSF-61

C. Manufacturers:
1. Apollo 76F-100-A Series
2. Nibco T-585-S6-R-66-LL
3. Or approved equal

2.03 GATE VALVE – (UP TO 8 INCHES)

A. Service: Buried Raw Water, Buried Brine

B. Construction:
1. Valve style: Plug-style polyethylene gate with strain-equalizing thread
2. Body material: PVC per ASTM D1784
3. Stem: Non-rising stem
4. Connection: Flanged
5. O-Ring: EPDM
6. Minimum Pressure Rating: 150 PSI at 73°F
7. Valve shall conform to NSF-61

C. Manufacturers:
1. Spears
2. Or approved equal

2.04 AIR & VACUUM RELEASE VALVE

A. Service: Raw Water, Brine

B. Construction:
1. Valve materials shall be corrosion-resistant to a maritime environment

a. Body: Shall be a corrosion-resistant plastic, 316 stainless steel, or thermoplastic
b. Float: Shall be stainless steel
c. Seals: EPDM

2. Valve shall provide the functions of both an air release and air/vacuum valve
a. Exhausts large quantities of air when the system starts up
b. Releases air pockets during system operation
c. Provides vacuum protection for the pipeline

3. Valve shall meet the performance requirements of AWWA C512

4. Valve shall conform to NSF-61

C. Manufacturers:
1. Val-matic Resilite Combination Valve
2. Or approved equal

2.05 RUBBER EXPANSION JOINTS

A. Service: Buried Raw Water, Buried Brine, Buried Recycled Water

B. Construction:
1. Joint body shall be an EPDM elastomer
a. Maximum operating temperature is 250°F
b. F.S.A Material Class shall be STD. III
c. Where joint is used in potable water applications, the EPDM shall be NSF-61 rated.

2. Joint shall have all 316 stainless steel hardware, not limited to, but including control rods, hex nuts, washers, and stiffener/retaining rings.

3. Joint shall be rated for a minimum of:
a. 4” lateral deflection
b. 27° of angular deflection
c. 2° of torsional rotation

4. Joint shall be flanged per ANSI B-16.1, unless otherwise noted

5. Joint shall have a minimum pressure rating of 150 PSIG

C. Manufacturers:
1. Proco UG234L
2. Or approved equal

2.06 PAINTING AND COATING

A. Buried Valves: All valves shall be polyethylene encased as outlined in Specification 33 05 33.

**PART 3 EXECUTION**

3.01 JOINTS

A. Flanged Joints: Boltholes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire

brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing: lubricate threads with oil and graphite and tighten nuts uniformly and progressively. If flanges leak under pressure testing, loosen or remove nuts and bolts, reseat or replace the gasket; reinstall or re-tighten the bolts and nuts; and re-test the joint. Joints shall be watertight.

B. Threaded Joints: Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

3.02 INSTALLATION

A. Valves - General: Install all valves and appurtenances in strict accordance with manufacturer's recommendations and in the locations shown in the Plans.

B. Valves in Horizontal Piping: Unless otherwise indicated in the drawings, install valves in horizontal runs of pipe with their operating stems vertical.

C. Backfill: Backfill within 24-inches of valves shall be clean washed sand in accordance with the requirements of Section 31 00 01 – Earthwork Special Provisions.

3.03 VALVE BOXES

A. Firmly support valve boxes and keep them centered and plumb over the operating nut of the valve. Do not use beveled sections of pipe at the top of the valve extension pipe. The final valve box elevation shall be flush with the finished pavement surface.

3.04 VALVE LEAKAGE TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See MCWD Standard Specification 15042, Hydrostatic of Pressure Pipelines, for testing requirements.

**END OF SECTION**

**SECTION 40 05 65.23**

**SWING CHECK VALVES**

## PART 1 - GENERAL

1.01 DESCRIPTION

Furnish and install swing check valves shown and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

A. In accordance with Section 01 33 00 – Submittal Procedures, submit manufacturer's Literature for all swing check valves to be provided by Contractor per the Contract documents. Manufacturer's Literature shall include, but is not limited to:
   1. Dimensional drawings
   2. Parts list drawings
   3. Operation and maintenance manuals
   4. Test certificates

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
   2. All swing check valves shall be hydrostatically and seat tested per AWWA C508. Manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

1.04 DELIVERY, STORAGE AND HANDLING

A. General. Swing check valves shall at all times be handled with equipment designed to prevent damage to the valve body, associated accessories, and interior and exterior coating of the swing check valves, if applicable. Hammering or otherwise means of impact to the swing check valves and associated accessories shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the swing check valves.

C. Unloading. Unloading from the trucks shall be done with care using slings. No valves shall be allowed to fall from trucks.

D. Storage. All packaged swing check valves and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets, if provided, shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.05 WARRANTY

A. Unless otherwise specified, all swing check valves shall be warrantied for one year per the manufacturer's standard terms.

## PART 2 - PRODUCTS

2.01 SWING CHECK VALVES

A. Unless approved otherwise by the Engineer, swing check valves shall be full waterway body type, with a domed access cover and vent port, and manufactured in conformance with ANSI/AWWA C508.

B. All swing check valves shall have a minimum pressure rating of 150 psi.

C. Materials:
   1. Valve body, cover, and disc shall be constructed from PVC Type 1, Grade 1 (ASTM D1784, Cell Classification 12454), CPVC (ASTM D1784, Cell Classification 23447) or glass filled Polypropylene (ASTM D4101, Cell Classification 85580).
   2. All seals and seats shall be EPDM or FPM.

D. Connections: All valves shall be provided with flanges drilled in accordance with ASME B16.42 Class 150.

E. Coating: Per Section 09 90 00 – Coatings of these Specifications.
   1. Color: Purple

F. Fasteners: All fasteners shall be stainless steel.

G. Manufacturers:
   1. Hayward
   2. Or approved equal

## PART 3 - EXECUTION

3.01 GENERAL

A. Care and Handling of Materials. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer's recommendations and the stipulations in Para. 1.04 of this Section.

B. Installation:
   1. The interior of the swing check valve shall be clean and free from contamination when installed and effective means shall be taken to prevent the entrance of foreign matter during progress of the work.
   2. The types and sizes of swing check valves to be used shall be as specified herein and as shown on the Drawings.
   3. Install and mount valves in accordance with manufacturer's recommendations, and as shown on the drawings.

**END OF SECTION**

**SECTION 40 71 13**

**MAGNETIC FLOW METERS**

## PART 1 GENERAL

1.01 DESCRIPTION

A. This section describes the requirements for electromagnetic flow meters suitable for water flow measurement.

1.02 REFERENCES

A. ANSI/AWWA C116/A21.16. – "Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings"

B. AWWA C213 – "AWWA C213-22 Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings"

C. AWWA C550 – "Protective Interior Coatings for Valves and Hydrants"

D. NSF-61 – "Drinking Water System Components – Health Effects"

1.03 SUBMITTALS

A. In accordance with Section 01 33 00, submit manufacturer's Literature for all meters to be provided by Contractor per the Contract documents, including but not limited to:
   1. Connection Diagrams for equipment wiring
   2. List of spare parts and optional equipment
   3. Equipment warranty

1.04 QUALITY ASSURANCE

A. Manufacturer Requirements:
   1. Each meter shall be factory-tested by manufacturer prior to shipping.

1.05 DELIVERY, STORAGE AND HANDLING

A. General. Electromagnetic flow meters shall at all times be handled with equipment designed to prevent damage to the meter, all other associated accessories, and interior and exterior coating of the meter, if applicable. Hammering or otherwise means of impact to meters and associated accessories shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the meters.

C. Unloading. Unloading from the trucks shall be done with care using slings. No meters shall be allowed to fall from trucks.

D. Storage. All packaged meters and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets, if provided, shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.06 WARRANTY

A. Unless otherwise specified, all electromagnetic flow meters shall be warrantied for at least one year, per manufacturer's standard terms.

B. In the event a component fails to perform as specified or is proven defective in service during the warranty period, the manufacturer shall promptly repair or replace the defective part at no cost to the Owner.

1.07 ENVIRONMENT

A. The project is located in a maritime environment. Salt is expected in the air, and the raw intake water is expected to be similar to seawater, with approximately 19,000 mg/L of Chloride, approximately 35 parts per thousand salinity, and an average annual temperature of 50°F to 64°F.

## PART 2 PRODUCTS

2.01 MAGNETIC FLOW METERS

A. Flow Meter: shall be a velocity-sensing electromagnetic type tube meter.
1. Manufacturer: McCrometer Ultramag 5000 series, or approved equal.
2. Accuracy: ±0.5% of actual flow
3. Calibration: Pre-programmed and pre-calibrated to user's specific applications
4. Diagnostics: Test mode and self-diagnostics
5. Line size: As shown on the drawings
6. Range: From 0.2 FPS - 32 FPS
7. Repeatability: ±0.05% to ±.0008 ft/s (±0.25 mm/s), whichever is greater

B. Flow Meter Sensor:
1. Operating principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.
2. The sensor flow tube shall be NEMA 6P or IP68 rated.
3. Flow tube shall be constructed of 304 Stainless Steel.
4. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion-bonded epoxy conforming to the applicable requirements of AWWA C213, AWWA C550 and ANSI/NSF-61 Measurement and grounding electrodes shall be 316 Stainless Steel.
5. Connecting flanges shall be AWWA 150# Flat Face.
6. Two Stainless Steel grounding rings shall be supplied with each flow meter.
7. Flow tube Operating Temp: +14 to +140° F.
8. Submergence: The sensor shall be capable of continual submergence at up to 30 ft. with standard strain relief cable or up to 6 ft.

C. Converter:

1. Electronic Enclosure: Shall be a NEMA 4X, IP67 rated enclosure.
2. Converter/display: Background illumination with alphanumeric 8-line graphical backlit LCD display with 6-key touch programming to indicate flow rate, totalized values, settings, and faults.
3. Power supply: 120 VAC
4. Operating temperature: -4 to +140 degrees F.
5. Outputs:
   a. Two 4-20 mA (0-21mA).
   b. Two separate digital programmable outputs:
   c. Open collector transistor usable for pulse
   d. Frequency and alarm settings
6. Converter shall be meter-mounted.

D. Additional Requirements:
1. Power & Signal Cabling: The power and signal between the converter and sensor are isolated and placed in separate cables.
2. Flow Direction Measurement: Forward and reverse flow indication and forward, reverse, net totalization is standard on all meters.

E. Coatings: Exterior surfaces shall be factory-coated with fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

F. All coils, electrode connections, and wire harness shall be rated for NEMA 6P/IP68 operation.

## PART 3 EXECUTION

3.01 GENERAL

A. Care and Handling of Materials:
1. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer's recommendations and the stipulations in Para. 1.04 of these specifications.

B. Installation:
1. Install and mount devices in accordance with manufacturer's recommendations, and as shown on the drawings.
2. Comply with manufacturer's recommended "straight pipe run" upstream and downstream of flow meter.
3. Wiring between flow sensors and signal converters shall use cable type and procedures as per the manufacturer's recommendations.

C. Grounding:
1. Ground flowmeter per Manufacturer's recommendation
2. Earth grounds shall be to an existing earth ground or a new earth ground rod in accordance to NEC.

D. Calibration:
   1. Meters shall be calibrated prior to delivery by the manufacturer.
   2. Manufacturer shall provide a calibrated meter set, which includes the sensor tub, cabling, and the converter.
   3. Flow meter shall be pre-configured with calibration information/data so that it commences with measurement without any programming during commissioning.
   4. An NIST certificate of calibration shall accompany each flow meter.

E. Conduit:
   1. For each flow meter, Contractor shall provide all conduits, condulets, pull boxes, uni-strut, receptacles, and all associated fixtures, fittings, and fasteners, with the number, size, and material of the conduits as defined in the Plans.
   2. Contractor shall provide all cabling and a pull rope in all conduit installations for any future cabling.

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the MCWD facilities, in coordination with the District and in compliance with these Contract Documents..

B. Provide all equipment warranties, operating manuals, spare parts, and special tools.

**END OF SECTION**

## SECTION 40 73 26

## GAUGE PRESSURE TRANSMITTERS

### PART 1 - GENERAL

1.01 DESCRIPTION

Furnish and install relative (gauge) pressure transmitters as shown in the drawings and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

In accordance with Section 01 33 00, submit manufacturer's Literature for all relative pressure transmitters to be provided by Contractor per the Contract documents. Literature shall include Manufacturer's catalog cuts indicating material compliance and specified options.

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Manufacturer shall be a company having manufacturing facilities in the United States with a minimum 5 years' experience specializing in manufacturing of such pressure measurement equipment in municipal water applications.
   2. Each transmitter shall be factory tested by manufacturer prior to shipping.

1.04 WARRANTY

A. Unless otherwise specified, all pressure measurement devices shall be warrantied for one year per the manufacturer's standard terms.

### PART 2 - PRODUCTS

2.01 PRESSURE SENSING AND CONTROL DEVICES

A. Pressure Transmitter
   1. General: Pressure transmitter shall be provided for monitoring the pressures within the water supply piping system at the locations specified in the Plans.
   2. Range: 0 to 150 psi
   3. Manufacturer/Model: Siemens SITRANS P200 Model 4CA00-GD1, or approved equal.
   4. Output: 4-20mA signal.
   5. Provide sufficient cable length such that there will be no splicing between mounting location and electrical/control panel.

B. Pressure Switch:
   1. General:
   2. Range: 0 to 150 psi
   3. Manufacturer/Model: Ashcroft B Series, or approved equal
   4. Output: Single-Pole Double-Throw
   5. Construction: NEMA 4X Enclosure

6. Provide sufficient cable length such that there will be no splicing between mounting location and electrical/control panel.

## PART 3 EXECUTION

3.01 GENERAL

A. Install and mount pressure sensing and control devices in accordance with manufacturer's recommendations, and as shown in the Plans.

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the MCWD water distribution facilities in coordination with the Owner per the Contract Documents.

B. Provide all equipment warrantees, operating manuals, spare parts and special tools.

**END OF SECTION**

**SECTION 43 25 00**

**SUBMERSIBLE VERTICAL TURBINE PUMPS**

## PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes material and product requirements for a submersible vertical turbine pumps.

B. The submersible vertical turbine pumps are owner-furnished and contractor installed

1.02 DELIVERY, STORAGE, AND HANDLING

A. The pump will be delivered to and stored by the Owner. Contractor shall coordinate with the Owner for the transportation of the pump to the project site.

B. Refer to Attachment A of this Specification for pump and motor information, such as dimension and weight.

1.03 CONDITIONS

A. Pump will sit in an intake well on Marina State Beach. The environment is expected to be a maritime environment, and the intake well water is conservatively considered ocean water.

## PART 2 - MATERIALS

2.01 PUMP

A. The pump shall be owner furnished and contractor installed.

B. A product cutsheet of the owner furnished pump is included in Attachment A of this specification

2.02 DESIGN CRITERIA

A. Operating Point: 550 GPM at 103 FT total dynamic head

B. Construction: 304 stainless steel pump

C. Design Intention: Temporary vertical turbine style pump used for water quality sampling.

## PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor under this specification shall have full responsibility for the proper installation and performance of said pumping equipment, including furnishing the services of a pumping equipment field Service Engineer to inspect during equipment installation, and to adjust, if necessary, any portion of the pumping equipment required herein.

B. Pumping equipment shall be installed as indicated on the Contract Drawings, unless otherwise approved by the Owner or Owner's Representative.

3.02 INSTALLATION

A. The pump, motor, and other appurtenances listed in the product cutsheet in Attachment A are owner-furnished. The Contractor is responsible for furnishing and installing all other items, such as but not limited to all electrical cabling, wellhead, and piping.

B. Field Splicing
   1. Field splicing may be required for the pump power cable.
   2. Splice shall be per the Manufacturer's recommendation and must be underwater proof and resistant to the maritime conditions in the well.

3.03 STARTUP AND TESTING

A. A qualified representative of the manufacturer (Field Service Engineer) shall be present at the site for one working day. For purposes of this paragraph, a working day is defined as an 8-hour period at the site, excluding travel time.

B. Contractor shall provide a qualified representative of the pump (Field Service Engineer) to perform an initial startup and to test all systems, operations, pump functions, leakage, and faults.

C. The qualified representative shall be required to demonstrate each operation, both manual and automatic, of the pump station. The demonstration shall be to the satisfaction of the engineer and District representative.

D. The pump unit(s) shall perform in the field substantially as shown on the certified pump curves furnished by the Contractor after reasonable allowances for field conditions. The head capacity, input horsepower, and overall efficiency values will be determined for at least three points in the stated operating range of the pump, and will be compared with the certified curves.

3.04 TRAINING

A. The training representative of the manufacturer shall be present at the site for one (1) work day to instruct District personnel on the operation and maintenance of the pump equipment.

B. District shall be provided with one physical and one digital copy of the pump Operation and Maintenance manual.

**END OF SECTION**

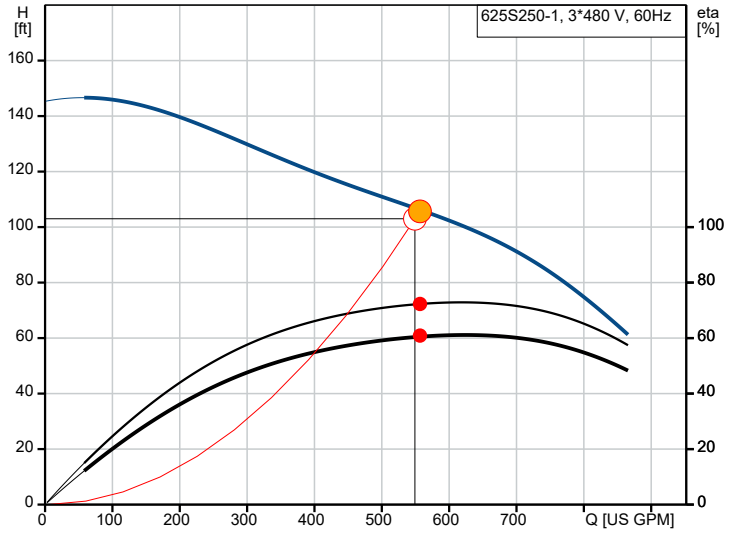
GRUNDFOS

**Company name:**
**Created by:**
**Phone:**

SPECIFCATION 43 35 00, ATTACHMENT A: GRUNDFOS 625S250 VERTICAL TURBINE SUBMERSIBLE PUMP (OFCI)

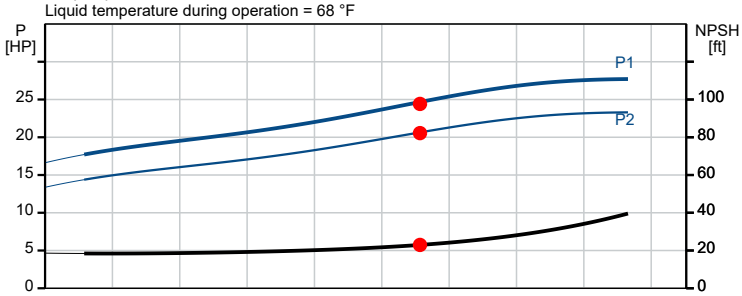
**Date:** 04/11/2025

| Description | Value |
|---|---|
| **General information:** | |
| Product name: | 625S250-1 |
| Product No: | 17BG3501 |
| EAN number: | 5700391964725 |
| **Technical:** | |
| Pump speed on which pump data are based: | 3450 rpm |
| Actual calculated flow: | 557 US GPM |
| Rated flow: | 656 US GPM |
| Resulting head of the pump: | 105.7 ft |
| Rated head: | 91.87 ft |
| Stages: | 1 |
| Number of reduced-diameter impellers: | NONE |
| Shaft seal for motor: | SIC/SICNBR |
| Approvals: | CULDWUS,CCSAUS |
| Approvals for drinking water: | PROP65 |
| Curve tolerance: | ISO9906:2012 3B |
| Model: | D |
| Motor version: | T40 |
| Return valve: | YES |
| **Materials:** | |
| Pump: | Stainless steel |
| | EN 1.4301 |
| | AISI 304 |
| Impeller: | Stainless steel |
| | EN 1.4301 |
| | AISI 304 |
| Motor: | Stainless steel |
| | DIN W.-Nr. 1.4301 |
| | AISI 304 |
| **Installation:** | |
| Maximum ambient pressure: | 870.23 psi |
| Maximum operating pressure: | 870.23 psi |
| Maximum outlet pressure: | 65.27 psi |
| Type of connection: | NPT(F) |
| Size of connection: | 6 inch |
| Motor diameter: | 6 inch |
| Minimum borehole diameter: | 8.46 in |
| **Liquid:** | |
| Pumped liquid: | Water |
| Liquid temperature range: | 5 .. 104 °F |
| Max liquid t at 0.15 m/sec: | 104 °F |
| Selected liquid temperature: | 68 °F |
| Density: | 62.29 lb/ft³ |
| Kinematic viscosity: | 1 cSt |
| **Electrical data:** | |
| Motor type: | MS6000 |
| Motor flange design: | Grundfos |
| Rated power - P2: | 25 HP |
| Power (P2) required by pump: | 25 HP |
| KVA code: | J |
| Mains frequency: | 60 Hz |
| Rated voltage: | 3 x 440-460-480 V |
| Service factor: | 1.15 |
| Rated current: | 41.0-40.0-39.5 A |
| Requested voltage: | 480 V |
| Rated current at this voltage: | 40 A |
| Starting current: | 540-590-620 % |
| Cos phi - power factor: | 0.85-0.83-0.80 |
| Rated speed: | 3460-3480-3490 rpm |
| Start. method: | direct-on-line |
| Enclosure class (IEC 34-5): | IP68 |
| Insulation class (IEC 85): | F |
| Built-in motor protection: | NONE |
| Thermal protec: | external |

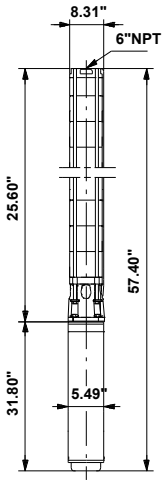


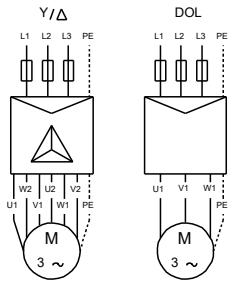

Q = 557 US GPM
Es = 0.5451 Wh/gal
Density = 62.29 lb/ft³
Eta pump+motor = 60.9 %
Liquid temperature during operation = 68 °F

H = 105.7 ft
Pumped liquid = Water
Eta pump = 72.3 %




P1 = 18.22 kW
P2 = 20.6 HP
NPSH = 22.96 ft




| | |
|---|---|
| U1, W2 | Brown |
| V1, U2 | Black |
| W1, V2 | Grey |

GRUNDFOS

**Company name:**
**Created by:**
**Phone:**

**Date:** 04/11/2025

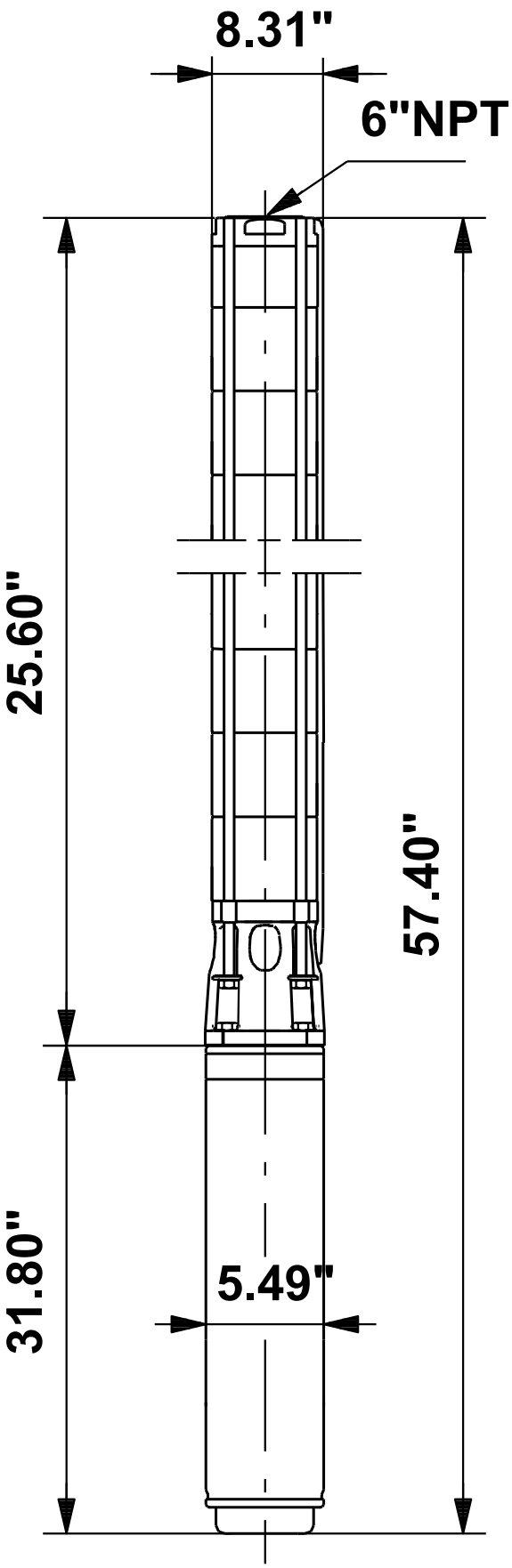
| Description | Value |
|---|---|
| Built-in temp. transmitter: | yes |
| Motor No: | 96166167 |
| Cable number: | N/A |
| Windings: | Enamelled |
| **Others:** | |
| Minimum efficiency index, MEI ≥: | -.-- |
| Net weight: | 209 lb |
| Gross weight: | 266 lb |
| Shipping volume: | 7.06 ft³ |
| Country of origin: | US |
| Custom tariff no.: | 8413.70.2004 |

GRUNDFOS

**Company name:**
**Created by:**
**Phone:**

**Date:** 04/11/2025

# 17BG3501 625S250-1 60 Hz




Note! All units are in [in] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

# STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF DOMESTIC WATER, SEWER AND RECYCLED WATER FACILITIES

**Marina Coast Water District**
11 Reservation Road
Marina, CA 93933
(831) 384-6131

# FOREWORD

The Marina Coast Water District adopted the *Procedures Guidelines and Design Requirements* and the *Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities* on September 24, 2003. The purpose of these documents is to ensure that construction of all facilities to be operated and maintained by the District is standardized wherever possible. These documents replace the Standard Specifications adopted by the District in July 1995 and revised in May 1997.

These documents may contain minor errors, discrepancies or omissions. The District reserves the right to make changes to these documents at any time. If users of these documents identify recommended changes, we ask you to please notify the Marina Coast Water District in writing at the following address:

Marina Coast Water District
Engineering Department
11 Reservation Road
Marina CA 93933

# REVISIONS

The *Procedures Guidelines and Design Requirements* and the *Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities* will be reviewed for possible revisions annually, and may be revised periodically as needed. Each revision will be published on pages to be inserted in the documents. Such revisions will bear the date of the revision and that data shall be the considered the latest edition as referred to the herein and in all subsequent advertisements, permits, and Contract Documents.

Each set of the *Procedures Guidelines and Design Requirements* and the *Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities* will be numbered consecutively as issued. Each holder will receive printed copies of each revision as they may occur, or electronic copies upon request. Each holder shall be responsible for verifying that he/she has the latest revised edition of these documents and shall be responsible for conformance with all provisions therein.

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STANDARD SPECIFICATIONS

**SECTION 01045**

**EXISTING FACILITIES**

## PART 1 - GENERAL

A. Description

This section includes requirements for connection to and abandonment of existing District facilities.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Chlorination of Domestic Water Mains and Services for Disinfection: | 15041 |
| 3. | Hydrostatic Testing of Pressure Pipelines: | 15042 |
| 4. | Hot Tap Connections | 15050 |
| 5. | Manual Valves: | 15100 |

C. Condition of Existing Facilities

The District does not warranty the condition, size, material, and location of existing facilities.

D. Location

The contractor shall be responsible for potholing and verifying in advance the location of all existing pipelines as shown on the plans. Discrepancies shall be reported to the project engineer, prior to the fabrication of, or purchase of material affected by the discrepancy.

E. Protection of Existing Utilities and Facilities

1. The contractor shall be responsible for the care and protection of all existing sewer pipe, water pipe, gas mains, culverts, power or communications lines, sidewalks, curbs, pavement, or other facilities and structures that may be encountered in or near the area of the work.

2. It shall be the duty of the contractor to notify Underground Service Alert and each agency of jurisdiction and make arrangements for locating their facilities prior to beginning construction.

3. In the event of damage to any existing facilities during the progress of the work, the contractor shall pay for the cost of all repairs and protection to said facilities. The contractor's work may be stopped until repair operations are complete.

4. Any existing water and sewer pipe to be abandoned and remain in place shall be allowed with approval of the City or County. The contractor shall seek all approvals to allow existing water and sewer lines to be abandoned in place. Abandoned water and sewer pipe is not the property of Marina Coast Water District and is the property of the developer or the property of the fee title owner to the development property.

F. Protection of Landscaping

1. The contractor shall be responsible for the protection of all the trees, shrubs, irrigation systems, fences, and other landscape items adjacent to or within the work area, unless they are directed to do otherwise on the plans.

2. In the event of damage to landscape items, the contractor shall replace the damaged items to the satisfaction of the engineer and the owner, or pay damages to the owner as directed by the District.

3. When the proposed pipeline is to be within planted or other improved areas in public or private easements, the contractor shall restore such areas to the original condition after completion of the work. This restoration shall include grading, a placement of 5 inches of good topsoil, resoding, and replacement of all landscape items indicated.

4. If the contractor does not proceed with the restoration after completion of the work or does not complete the restoration in a satisfactory manner, the engineer reserves the right to have the work done and to charge the contractor for the actual cost of the restoration including all labor, material, and overhead required for restoration.

G. Permits

All work shall conform to the specifications and requirements of the State of California Department of Transportation, the County, the city having jurisdiction, or the other affected agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits. Permits shall also include any related to the abandonment of an existing water or sewer pipe.

## PART 2 - MATERIALS

All materials used in making the connection or removing the facility from service shall conform to the applicable sections of these specifications.

A. Grout

Grout shall consist of Portland cement and water or of Portland cement, sand, and water; and all grout mixtures shall contain 2% of bentonite by weight of the cement. Grout shall be a pump mix with a minimum of six sacks cement (564 lbs) per cubic yard.

Portland cement, water and sand shall conform to the applicable requirements of the concrete section (Section 03300), except that sand to be used shall be of such fineness that 100% will pass a standard 8-mesh sieve and at least 45%, by weight, will pass a standard 40-mesh sieve.

B. Concrete

Concrete used for the replacement of damaged or removed facilities shall be in accordance with Section 03300 and shall match the mix design of the existing facility and per the requirement of the jurisdictional agency.

## PART 3 - EXECUTION

A. Connection to Existing Facilities

1. All connections shall be made by the contractor unless shown otherwise on the plans or specified herein.

2. If multiple connections to the District's water/recycled water/sewer system are anticipated, the contractor shall submit a connection plan developed with the intent of minimizing the down time to District customers and will be reviewed and approved by the District.

3. When customers are affected, the contractor shall notify the district a minimum of seven working days before the time of any proposed shutdown of existing mains or services. The District inspector may postpone or reschedule any shutdown operation if for any reason he feels that the contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work.

4. When no customers are affected, the contractor shall notify the District a minimum of two working days before the time of any proposed shutdown of existing mains or services. The District inspector may postpone or reschedule any shutdown operation if for any reason he feels that the contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work.

5. Connections shall be made only in the presence of the District, and no connection work shall proceed until the engineer has given notice to proceed. If progress is inadequate during the connection operations to complete the connection in the time specified, the engineer shall order necessary corrective measures. All costs for corrective measures shall be paid by the contractor.

6. The contractor shall furnish all pipe and materials including furnishing all labor and equipment necessary to make the connections, all required excavation, backfill, pavement replacement, lights, and barricades, and may be required to include a water truck, high line hose, and fittings as part of this equipment for making the connections. In addition, the contractor shall assist the District in alleviating any hardship incurred during the shutdown for connections. Standby equipment or materials may be required by the engineer.

7. The contractor shall de-water existing mains, as required, in the presence of the engineer.

8. Connections shall be made with as little change as possible in the grade of the new main. If the grade of the existing pipe is below that of the new pipeline, a sufficient length of the new line shall be deepened so as to prevent the creation of any high spot or abrupt changes in grade of the new line. Where the grade of the existing pipe is above that of the new pipeline, the new line shall be laid at specified depth, except for the first joint adjacent to the connection, which shall be deflected within the allowances of the pipe manufacturer as necessary to meet the grade of the existing pipe. If sufficient change in direction cannot be obtained by the limited deflection of the first joint, a fitting of the proper angle shall be

installed. Where the connection creates a high or low spot in the line, a standard air release or blow off assembly shall be installed as directed by the engineer.

9. Where connections are made to existing valves, the contractor shall furnish and install all temporary blocking, steel clamps, shackles, and anchors as required by the District, and he shall replace the valve riser box and cover and adjust the valve cover to the proper grade in accordance with these specifications. The District will operate all existing valves. All valves, existing or newly installed, shall be readily accessible at all times to the District for emergency operation.

10. New pipelines shall not be connected to existing facilities until the new pipelines have been successfully tested, disinfected and accepted by the District.

11. Tapping connection can be made to the existing system while it is either in service or shut down depending on the District's prior direction. A tapping valve shall be used when the existing system is maintained in service during connection. Tapping shall be in accordance with the specification requirements for the pipe being tapped.

12. All saddle connections into existing sewer pipes shall be made with a wye saddle. Saddles shall conform to the applicable provisions of the section for the existing sewer pipe material.

B. Removal from Service of Existing Mains and Appurtenances

1. Existing mains and appurtenances shall be removed from service at the locations shown on the plans or as directed by the engineer.

2. Abandoned pipe shall be filled with grout.

3. Existing pipe and appurtenances removed from the ground will require backfill and repair of surface in accordance with Section 02223.

4. Removed pipe and appurtenances shall be temporarily stockpiled on the job in a location that will not disrupt traffic or be a safety hazard, disposed of in a proper manner (as determined by the engineer). The contractor shall remove and dispose of all removed pipe at his own expense to a landfill permitted to accept such materials.

5. Before excavating for installing mains that are to replace existing pipes and/or services, the contractor shall make proper provisions for the maintenance and continuation of service as directed by the engineer unless otherwise specified.

6. If the meter box is to be removed from an abandoned water service, the service line is to be removed and the corporation stop closed and capped. If there is no corporation stop on the service, the adapter is to be removed and a brass plug is to be installed in the service saddle.

7. Asbestos Cement Pipe (ACP) shall be cut, removed and disposed of in a proper manner. The contractor shall be responsible for the proper manifesting of any and all ACP at an authorized disposal site. See Section 15072 for additional requirements.

C. Cutting and Restoring Street Surfacing.

1. In cutting or breaking up street surfacing, the contractor shall not use equipment that will damage adjacent pavement.

2. All asphalt and/or Portland cement concrete surfaces shall be scored with sawing equipment of a type meeting the approval of the District; providing however, that any cement concrete base under an asphaltic mix surface will not be required to be scored by sawing. Existing paving surfaces shall be saw cut back beyond the edges of the trenches to form neat square cuts before repaving is commenced.

3. Pavement, sidewalks, curbs, or gutters removed or destroyed in connection with performance of the work shall be saw cut to the nearest score marks, if any, and shall be replaced with pavement sidewalks, curbs, or gutters of the same kind, or better by the contractor in accordance with the latest specifications, rules, and regulations and subject to the inspection of the agency having jurisdiction over the street or highway.

4. Aggregate base shall be placed beneath the restored pavement to the thickness required by the agency having jurisdiction.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 02200**

**STRUCTURE EARTHWORK**

## PART 1 - GENERAL

A. Description

This section includes excavation, backfilling, materials, testing, and shoring for structures.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Trenching, Backfilling, and Compacting: 02223

2. Concrete: 03300

C. Testing for Compaction

Testing for compaction shall conform to Section 02223.

D. Definition of Zones

1. Pavement and street zones shall be as specified in Section 02223.

2. Backfill zone is the backfill from the bottom of the structure excavation to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

E. Permits

All work shall conform to the specifications and requirements of the State of California Department of Transportation, the city having jurisdiction, or any other affected agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

F. Submittal

For any shoring or sheeting systems to be used for excavation, the contractor shall submit shoring plans and calculations designed and sealed by a registered structural engineer in the State of California.

## PART 2 - MATERIALS

Native earth backfill, imported backfill material, granular material, imported sand, and crushed rock shall conform to the requirements of Section 02223.

## PART 3 - EXECUTION

A. Compaction Requirements

| | | |
|---|---|---|
| 1. | Backfill in Street Zone: | 95% relative compaction |
| 2. | Structural Backfill: | 95% relative compaction |
| 3. | Gravel Base: | 95% relative compaction or as approved by the engineer |
| 4. | Adjacent to existing structures: | 95% relative compaction |

B. Sidewalk, Pavement, and Curb Removal

1. Saw cut bituminous or concrete pavements regardless of their thickness, and curbs and sidewalks prior to excavation for the structure in accordance with the requirements of the city, or agency having jurisdiction. Curbs and sidewalks, that are damaged in the course of construction, are to be cut and removed from joint to joint.

2. Haul removed pavement and concrete materials from the site, to a proper disposal facility. These materials are not permitted for use as backfill. If the material to be removed exceeds 50 cubic yards, the contractor shall obtain a haul route permit from the city(s) having jurisdiction.

C. De-watering

1. Provide and maintain means and devices to continuously remove and dispose of all water entering the excavation during construction of the structure and all backfill operations.

2. Dispose of the water in a manner to prevent damage to adjacent property and pipe trenches.

3. Do not allow water to rise in the excavation until backfilling around and above the structure is completed.

4. Reporting shall conform to the requirements of the District's NPDES permit. A copy of the District’s permit is available from the District.

5. In no event shall the sewer system be used as a drain for de-watering.

D. Structure Excavation

1. Structure excavation shall include the removal of all material of whatever nature necessary for the construction of structures and foundations in accordance with the plans and these specifications.

2. The sides of excavations for structures shall be sufficient to leave at least a 2-foot clearance, as measured from the extreme outside of form work or the structure, as the case may be.

3. Surplus material shall be disposed of by the contractor in accordance with Section 02223.

E. Correction of Over Excavation

1. Where excavation is inadvertently carried below design depths, suitable provision shall be made by the contractor to adjust construction, as directed by the District representative, to meet requirements incurred by the deeper excavation.

2. No earth backfill will be permitted to correct over excavation beneath structures.

3. Over excavation shall be corrected by backfilling with crushed rock or concrete, as directed by the District representative.

F. Bracing

1. The contractor's design and installation of bracing and sheeting shall take the necessary precautions to be consistent with the rules, orders, and regulations of the State of California Construction Safety Orders.

2. Excavations shall be so braced, sheeted, and supported that they will be safe, such that the walls of the excavation will not slide or settle and all existing improvements of any kind, either on public or private property, will be fully protected from damage.

3. The sheeting, shoring, and bracing shall be arranged so as not to place any stress on portions of the completed work.

4. Carefully remove sheeting, shoring, bracing, and timbering to prevent the caving or collapse of the excavation faces being supported.

G. Backfill

1. After structures and foundations are in place, backfill shall be placed to the original ground line or to the limits designated on the plans.

2. No material shall be deposited against concrete structures until the concrete has reached a compressive strength of at least 3,000 pounds per square inch as tested per Section 03300.

3. Imported sand or granular material shall be placed in horizontal layers not exceeding 12 inches in depth.

4. Each layer of backfill material shall be moistened and thoroughly tamped, rolled, or otherwise compacted to the specified relative density.

5. Carefully operate compaction equipment near structures to prevent their displacement or damage. Structural fill is to be placed and compacted in uniform layers around all sides of the structure.

6. One-sack cement slurry may be used as structural backfill material.

H. Pavement Replacement

Pavement replacement shall be in accordance with the requirements of the city or the agency having jurisdiction.

I. Permits

An Encroachment Permit from the city or agency having jurisdiction is required prior to any work within public right-of-way. All traffic control and pavement replacement work shall be in accordance with the requirements of the permit and the agency Inspector.

A permit from OSHA is required of any excavation exceeding 5 feet.

Follow all restrictions of the required permits from other agencies.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 02223**

# TRENCHING, BACKFILLING, AND COMPACTING

## PART 1 - GENERAL

A. Description

This section includes materials, testing, and installation for trench excavation, backfilling, and compacting.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

C. Testing for Compaction

1. Determine the density of soil in place by the use of a sand cone, drive tube, or nuclear tester.

2. Determine laboratory moisture-density relations of existing soils by ASTM D 1557.

3. Determine the relative density of cohesionless soils by ASTM D 2049.

4. Sample backfill materials by ASTM D 75.

5. Express "relative compaction" as the ratio, expressed as a percentage, of the in place dry density to the laboratory maximum dry density.

6. Compaction shall be deemed to comply with the specifications when no test falls below the specified relative compaction.

7. The developer will secure the services of a soils tester and pay the costs of all compaction testing. On capital projects, the District will secure the service of a soils tester and pay the cost of initial testing. The contractor will be responsible for the cost of all retests in failed areas. Test results will be furnished by the District representative.

D. Pavement Zone

The pavement zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill.

E. Street Zone

The street zone is the top 18 inches of the trench or depth determined by the jurisdictional agency immediately below the pavement zone in paved areas.

F. Trench Zone

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

G. Pipe Zone

The pipe zone shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level 12 inches above the top of the pipe. Where multiple pipes or conduits are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipes to a horizontal level 12 inches above the top of the highest or topmost pipe.

H. Pipe Bedding

The pipe bedding shall be defined as a layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded. Thickness of pipe bedding shall be as shown on the drawings or as described in these specifications for the particular type of pipe installed.

I. Excess Excavated Material

1. The contractor shall make the necessary arrangements for and shall remove and dispose of all excess excavated material unless indicated differently in the special provisions for any job.

2. It is the intent of these specifications that all surplus material not required for backfill or fill shall be properly disposed of by the contractor at his expense at a proper disposal site.

3. No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the contractor. Before the District will accept the work, the contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposing excess excavated material, absolving the District from any liability connected therewith.

4. The contractor shall obtain a haul route permit from the city or agency having jurisdiction.

J. Safety

1. All excavations shall be performed, protected, and supported as required for safety and in the manner set forth in the operation rules, orders, and regulations prescribed by the Division of Industrial Safety of the State of California.

2. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrians and vehicular traffic of such excavations. Lights shall also be placed along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled.

3. No trench or excavation shall remain open during non-working hours. The trench or excavation shall be covered with steel plates, spiked in place, or secured with temporary A.C. pavement around the edges, or backfilled. A security fence shall be installed around the work area during non-working hours.

4. The contractor shall notify the District of all work-related accidents which may occur to persons or property at or near the project site, and shall provide the District with a copy of all accident reports. All accident reports shall be signed by the contractor or its authorized representative and submitted to the District's authorized representative within twenty-four (24) hours of the accident's occurrence.

K. Access

Unobstructed access must be provided to all driveways, water valves, hydrants, or other property or facilities that require routine use.

L. Permits

All work shall conform to the specifications and requirements of the State of California Department of Transportation, the city having jurisdiction, or and other agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

M. Slope Protection

Slope protection shall be installed where shown on the plans in accordance with MCWD Standard Plan S-10, wherever the profile of the ground surface above the water or sewer main exceeds 20%, and where no pavement of other surfacing is to be laid over the facility. The installation of the slope protection shall be considered a part of the work, and the contractor shall include the expense in his cost.

## PART 2 - MATERIALS

A. Native Earth Backfill

1. The use of native earth as backfill material will require the approval of the District representative in all cases.

2. Native earth backfill, acceptable for use, shall be fine-grained material free from roots, debris, and rocks with a maximum dimension not larger than 4 inches.

3. Native backfill shall not be used in the pipe zone.

B. Imported Backfill Material

1. Whenever the excavated material is not suitable for backfill, the contractor shall arrange for and furnish suitable imported backfill material that is capable of attaining the required relative density.

2. The contractor shall dispose of the excess trench excavation as specified in the preceding section. Backfilling with imported material shall be done in accordance with the methods described herein.

C. Granular Material

Granular material shall be defined as soil having a minimum sand equivalent of 30 as determined in accordance with State of California, Division of Highways, Test "California 217," with not more than 20% passing a 200-mesh sieve.

D. Imported Sand

Imported sand shall have a minimum sand equivalent of 30 per State of California, Division of Highways, Test "California 217" with 100% passing a 3/8-inch sieve and not more than 20% passing a 200-mesh sieve. Certification that the sand meets this requirement shall be provided.

E. Crushed Rock and Gravel

1. Crushed rock shall be the product of crushing rock or gravel. Fifty percent of the particles retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing. Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be weatherworn particles. Gravel shall not be added to crushed rock.

2. Gravel shall be defined as particles that show no evidence of mechanical crushing, are fully weatherworn, and are rounded. For pipe bedding, where gravel is specified, crushed rock may be substituted or added.

3. Where crushed rock or gravel is specified in the bedding details on the plans, the material shall have the following gradations:

| Sieve Size | 1-1/2 Inch Max Gravel % Passing | 1-inch Max Gravel % Passing | ¾ Inch Max Crushed Rock % Passing |
|---|---|---|---|
| 2” | 100 | | |
| 1-1/2” | 90 – 100 | 100 | |
| 1” | 20 – 55 | 90 – 100 | 100 |
| ¾” | 0 – 15 | 60 – 80 | 90-100 |
| ½” | - | - | 30 – 60 |
| 3/8” | 0 –5 | 0 – 15 | 0 – 20 |
| No. 4 | - | 0 – 5 | 0 – 5 |
| No. 8 | - | - | - |

F. Sand-Cement Slurry

Sand-cement slurry shall consist of one sack (94 pounds) of Portland cement per cubic yard of sand and sufficient moisture for workability.

## PART 3 - EXECUTION

A. Compaction Requirements

1. The developer will engage the services of a qualified soils engineering firm to determine the relative compaction of the trench backfill. On capital projects, the District will engage the services of a qualified soils engineering firm to determine the relative compaction of the trench backfill.

2. If the backfill fails to meet the specified relative compaction requirements, the contractor shall rework the backfill until the requirements are met. The contractor shall make all necessary excavations for density tests as directed by the District representative. The compaction requirements of the city having jurisdiction or Caltrans shall prevail in all public roads. The developer or contractor will be responsible for the cost of all additional compaction tests in the reworked areas.

3. Compaction tests shall be performed at random depths and at 200-foot intervals and as directed by the District representative.

4. Unless otherwise shown on the drawings or otherwise described in the specifications for the particular type of pipe installed, relative compaction in pipe trenches shall be as described below:

   a. Pipe zone and pipe base: 95% relative compaction

   b. Trench zone not beneath paving: 95% relative compaction

   c. Trench zone to street zone in paved areas: 95% relative compaction

   d. Street zone in paved areas: per agency requirements or 95% relative compaction. The most stringent agency requirements shall prevail

   e. Rock refill material for foundation stabilization: 90% relative density

   f. Rock refill for over excavation: 90% relative density

B. Material Replacement

Removal and replacement of any trench and backfill material which does not meet the specifications shall be the contractor's responsibility.

C. Clearing and Grubbing

1. Areas where work is to be performed shall be cleared of all trees, shrubs, rubbish, and other objectionable material of any kind which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use, or would form obstructions therein.

2. Organic material from clearing and grubbing operations will not be incorporated in the trench backfill.

3. Organic material from clearing and grubbing operations will be disposed of at a proper waste disposal facility.

D. Sidewalk, Pavement, and Curb Removal

1. Saw cut bituminous or concrete pavements regardless of their thickness, and curbs and sidewalks prior to excavation for the structure in accordance with the requirements of the city, or agency having jurisdiction. Curbs and sidewalks, that are damaged in the course of construction, are to be cut and removed from joint to joint.

2. Haul removed pavement and concrete materials from the site, to a proper disposal facility. These materials are not permitted for use as trench backfill. If the material to be removed exceeds 50 cubic yards, the contractor shall obtain a haul route permit from the city(s) having jurisdiction.

E. Trenching and Tunneling

1. Excavation for pipe, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the facilities as shown on the plans.

2. Trench banks shall be kept as near to vertical as possible and shall be properly braced and sheeted.

3. Tunneling will not be permitted.

4. The use of a jack and bore or hydraulic ram may be employed.

F. Bracing

1. The contractor's design and installation of bracing and shoring shall be consistent with the rules, orders, and regulations of the State of California Construction Safety Orders.

2. Excavations shall be so braced, sheeted, and supported that they will be safe such that the walls of the excavation will not slide or settle and all existing improvements of any kind, either on public or private property, will be fully protected from damage.

3. The sheeting, shoring, and bracing shall be arranged so as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength.

4. Care shall be exercised in the drawing or removal of sheeting, shoring, bracing, and timbering to prevent the caving or collapse of the excavation faces being supported.

G. Trench Widths

1. Excavation and trenching shall be true to line so that a clear space of not more than 8 inches or less than 6 inches in width is provided on each side of the largest outside diameter of the pipe in place measured at a point 12 inches above the top of the pipe. For the purpose of this article, the largest outside diameter shall be the outside diameter of the bell on bell and spigot pipe or the pipe collar.

2. Where the sewer trench width, measured at a point 12 inches above the top of the bell of the pipe, is wider than the maximum set forth above, the trench area around the pipe shall be backfilled with crushed rock, Class B concrete, or slurry to form a cradle for the pipe as shown on the MCWD Standard Plan S-5 at the discretion of the District representative.

H. Length of Open Trench

The maximum allowable length of open trench shall be 600 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is less. Within developed areas, the length of open trench may be restricted as determined by the encroachment permit from the city or the agency having jurisdiction.

I. Grade

1. Excavate the trench to the lines and grades shown on the drawings with allowance for pipe thickness and for pipe base or special bedding.

2. The trench bottom shall be graded to provide a smooth, firm, and stable foundation that is free from rocks and other obstructions and shall be at a reasonably uniform grade.

J. Correction of Over Excavation

1. Where excavation is inadvertently carried below the design trench depth, suitable provision shall be made by the contractor to adjust the excavation, as directed by the District representative, to meet requirements incurred by the deeper excavation.

2. Over excavations shall be corrected by backfilling with approved graded crushed rock or gravel and shall be compacted to provide a firm and unyielding subgrade or foundation, as directed by the District representative.

K. De-watering

1. The contractor shall provide and maintain at all times during construction ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. De-watering shall be done by methods that will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. De-watering methods may include well points, sump points, suitable rock or gravel placed below the required bedding for drainage and pumping, temporary pipelines, and other means, all subject to the approval of the District representative. Water shall be discharged in accordance with the requirements of the District's NPDES permit.

2. In no event shall the sewer system be used as drains for de-watering the construction trenches.

3. De-watering shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise. No concrete shall be poured in water, nor shall water be allowed to rise around the concrete or mortar until it has set at least eight hours.

L. Foundation Stabilization

1. Whenever the trench bottom does not afford a sufficiently solid and stable base to support the pipe or appurtenances, the contractor shall excavate to a depth below the design trench bottom, as directed by the District representative, and the trench bottom shall be backfilled with 3/4-inch rock and compacted to provide uniform support and a firm foundation.

2. Where rock is encountered, it shall be removed to a depth at least 6 inches below grade and the trench shall be backfilled with 3/4-inch crushed rock to provide a compacted foundation cushion.

3. If excessively wet, soft, spongy, unstable, or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall removed to a depth as determined in the field by the District representative and replaced by crushed rock.

M. Excavated Material

1. All excavated material shall not be stockpiled in a manner that will create an unsafe work area or obstruct sidewalks or driveways. Gutters shall be kept clear or other satisfactory measures shall be taken to maintain street or other drainage.

2. In confined work areas, the contractor may be required to stockpile the excavated material off-site, as determined by the project permits.

N. Placing Pipe Bedding

1. Place the thickness of pipe bedding material over the full width of trench necessary to produce the required bedding thickness when the material is compacted to the specified relative density. Grade the top of the pipe bedding ahead of the pipe to provide firm, uniform support along the full length of pipe.

2. Excavate bell holes at each joint to permit assembly and inspection of the entire joint.

O. Placing Mounds to Support Pipe (DIP Only)

1. As an alternate to placing continuous imported sand pipe bedding material, the ductile iron pipe may be supported on mounds of imported sand.

2. The mounds shall be of imported sand and extend the full trench width. The mounds shall provide a minimum of 6 inches of contact with the pipe.

3. The pipe shall be supported to maintain its design line and grade.

4. The mounds shall be located 2½ feet from the bell/spigot of the pipe.

P. Backfilling within Pipe Zone

1. Backfill per the detailed piping specification for the particular type of pipe and per the following.

2. After pipe has been installed in the trench, place pipe zone material simultaneously on both sides of the pipe, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling.

3. Compact material placed within 12 inches of the outer surface of the pipe by hand tamping only.

Q. Backfill within Trench Zone

1. Compact per the detailed piping specification for the particular type of pipe and per the following.

2. Push the backfill material carefully onto the backfill previously placed in the pipe zone. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe.

3. The remaining portion of the trench to the street zone or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated by approved methods to obtain the specified relative compaction.

   a. Compaction using vibratory equipment, tamping rollers, pneumatic tire rollers, or other mechanical tampers shall be done with the type and size of equipment necessary to accomplish the work. The backfill shall be placed in horizontal layers of such depths as are considered proper for the type of compacting equipment being used in relation to the backfill material being placed. Each layer shall be evenly spread, properly moistened, and compacted to the specified relative density. The contractor shall repair or replace any pipe, fittings, manholes, or structures as directed by the District representative damaged by the contractor's operations.

   b. Consolidation of backfill performed by flooding, poling, or jetting shall obtain a relative compaction of the backfill material at least equal to that specified. When flooding, poling, or jetting methods are used, material for use as backfill shall be placed and consolidated in layers not exceeding 3-feet thick. Flooding, poling, or jetting methods shall be supplemented by the use of vibratory or other compaction equipment when necessary to obtain the required relative compaction. Care shall be taken in all consolidating operations to prevent the movement or floating of the pipe. Consolidation methods shall not be used where the backfill material is not sufficiently granular to be self-draining during and after consolidation, or where foundation materials may be softened or otherwise damaged by the quantities of water applied. The contractor shall rectify any misalignment of the pipe because of consolidation operations as directed by the District representative.

R. Backfill within Street Zone

1. The street zone within roadbed areas shall be compacted using approved hand, pneumatic, or mechanical type tampers to obtain the required relative compaction.

2. All work shall be done in accordance with the requirements and to the satisfaction of the city or the agency having jurisdiction.

3. Flooding and jetting will not be permitted in this Zone.

S. Sidewalk, Pavement, and Curb Replacement

Replace bituminous and concrete pavement, curbs, and sidewalks damaged or removed during construction in accordance with the requirements of the city or the agency having jurisdiction.

T. Slope Protection

1. Where cutoff walls or concrete anchors are required, they shall be in accordance with MCWD Standard Plan S-10, with a minimum thickness of 12 inches. The wall shall extend at least 12 inches to undisturbed material on each side of the trench as excavated. Cemented rubble and concrete surface slope protection shall be a minimum of 4-inches thick.

2. Wall or anchors shall be placed with a minimum horizontal spacing of:

   a. Not over 36 feet center to center on grades 25% to 35%

   b. Not over 24 feet center to center on grades 35% to 50%

   c. Not over 16 feet center to center on grades 50% and over

3. Material used for construction of cutoff walls or concrete anchors shall consist of cast-in-place reinforced concrete or reinforced hollow unit masonry. When reinforced hollow unit masonry is used, all cells in the block shall be filled solidly with grout. A No. 4 reinforcing bar shall be placed in vertically in each row of cells and No. 9-gage wall mesh shall be placed in each horizontal joint. In addition, a bond beam shall be placed at the top with two No. 4 bars.

   Where cutoff walls or concrete anchors are constructed of reinforced concrete, they shall have No. 4 reinforcing bars placed at 6-inches on center each way in the center of the wall. The bars shall extend full length and height of the wall.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 02315**

# JACKED CASING

## PART 1 - GENERAL

A. Description

Tunneling method by jacked casing, directional drilling, or a tunnel boring machine, for highway, railroad, creek, and culvert crossings and other shallow depth tunnels, and carrier pipe installation.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Concrete: | 03300 |
| 3. | Hydrostatic Testing of Pressure Pipeline: | 15042 |

C. Permits

All work shall conform to the specifications and requirements of the State of California Department of Transportation, the County, the city having jurisdiction, or and other agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

D. Alternative Methods

The contractor may present an alternative detailed proposal in lieu of the methods and materials specified herein to jack or bore casing pipe at the locations shown on the plans. Any such proposal shall be presented to the District representative a minimum of 28 calendar days in advance of the work to allow adequate time for checking, and must be in accordance with all the conditions set forth in the permits.

E. Safety

The contractor shall obtain from the Division of Industrial Safety a classification for each bore exceeding 30-inches in diameter. It shall be the contractor's responsibility to see that the work is done in conformance with the state requirements. It shall also be the contractor's responsibility to call the required safety meeting with representatives from the State Division of Industrial Safety prior to beginning the construction of each bore.

F. Scheduling

If the pipeline is not installed within the casing as a continuous operation following completion of jacking, then bulkhead the portals and backfill the approach trenches and later reopen them for pipe installation.

G. Line and Grade

1. The contractor's attention is called to the fact that the casing pipe must be installed to the tolerances listed on the plans so as to permit the construction of the carrier pipe to the lines and grades shown on the plans.

2. It is the contractor's responsibility to choose a size of casing at or above the minimum specified, to insure that the jacking is done with a high degree of accuracy to permit installation of the carrier pipe to the grades shown on the plans.

H. Design

It is the contractor's responsibility to retain an engineer to design a casing that meets or exceeds the minimum specified, and to insure that the casing is compatible with the jacking machine, and the boring head used. Design must be submitted to and approved by District Engineer

## PART 2 – MATERIALS

A. Steel Casing

1. New steel casing pipe, unless otherwise approved by the District representative, shall be butt-welded sheets conforming to ASTM A 245, commercial grade or of plate conforming to ASTM A 283, Grade C, or ASTM A-36.

2. The minimum size and thickness of casing pipes for insertion of various sizes of carrier pipes shall be as described below, unless a larger or heavier wall casing pipe is required by the agency having jurisdiction over the road or railroad crossing:

| Pipe Size (Inches) | Min. I.D./O.D. Casing Size (Inches) | Min. Wall Thickness (Inches) |
|---|---|---|
| 4 | 12" I.D. | ¼ |
| 6 | 16" I.D. | ¼ |
| 8 | 18" I.D. | ¼ |
| 12 | 24" O.D. | 5/16 |
| 16 | 30" O.D. | 3/8 |

3. It is the contractor's responsibility to retain a design engineer to choose a size of casing at or above the minimum specified, in order that the jacking may be done with a sufficient degree of accuracy to permit installation of the carrier pipe to the grades shown on the plans. The contractor may select a greater thickness and diameter as convenient for method of work and loadings involved, as suitable for the site and as limited by possible interferences, but at no additional cost to District. If specified on the plans, provide 2-inch grout connections spaced at the top and bottom for casing 30-inches and larger in diameter as specified in the contract drawings.

Casing sections shall be joined by full-circumference butt-welding in the field. Prepare ends of casings for welding by providing ¼-inch X 45 degree chamfer on outside edges.

B. Grout

1. Grout shall consist of Portland cement and water or of Portland cement, sand, and water; and all grout mixtures shall contain 2% of bentonite by weight of the cement.

2. Portland cement, water and sand shall conform to the applicable requirements of the concrete section (Section 03300), except that sand to be used shall be of such fineness that 100% will pass a standard 8-mesh sieve and at least 45%, by weight, will pass a standard 40-mesh sieve.

3. Bentonite shall be a commercially processed powdered bentonite, Wyoming type, such as Imacco-gel, Black Hills or approved equal.

C. Stainless Steel Spacers

Casing spaces shall be bolt on style with a two-piece shell made of 304 stainless steel of a minimum 14-gauge thickness. Each shell section shall have bolt flanges formed with fins for added strength. Each connection flange shall have a minimum of three 5/16 inch 304 stainless bolts. The shell shall be lined with a ribbed PVC extrusion with a retaining section that overlaps the edge of the shell and prevents slippage. Bearing surfaces (runners) made from UHMW polymer with a static coefficient of friction of 0.11 - 0.13 shall be attached to support structures (risers). The runners shall be attached mechanically by 304 stainless fasteners that are inserted through the punched riser section and welded for strength. Risers shall be made of 304 stainless of a minimum 14 gauges. All risers over 2 inches in height shall be reinforced. Risers shall be welded to the shell. All metal surfaces shall be fully passivated. Casing spacers shall be as specified on the plans.

D. End Seal

End seals shall be virgin Buna-s or Buna-gis (styrene-butadiene) rubber with 316 stainless steel bands. End seal kits shall include a bottle of bonding cement. End seals shall be “Link Seal” or “PSI Model C” end seals.

E. Sacrificial Anodes for Cathodic Protection

1. Anodes for cathodic protection of steel casing shall be sized for the amount of casing surface area and shall be a minimum of 2-inch by 2-inch by 60-inch high purity zinc anodes, bagged in calcium sulfate and bentonite backfill.

2. The anodes shall be cadwelded to the casing with No. 6 high molecular weight polyethylene (HMWPE) -covered, stranded copper lead wire.

## PART 3 - EXECUTION

A. Sectional Shield or Jacking Head

1. Fit a sectional shield or steel jacking head to the leading section of the casing. The shield or head shall extend around the outer surface of the upper two-thirds of the casing and

project at least 18 inches beyond the driving end of the casing. It shall not protrude more than ½ inch beyond the outer casing surface.

2. Anchor the head to prevent any wobble or alignment variation during the jacking operation.

3. To avoid loss of ground outside the casing, carry out excavation entirely within the jacking head and not in advance of the head. In general, excavated material shall be removed from the casing as jacking progresses and no accumulation of excavated material within the casing will be permitted.

4. A jacking band to reinforce the end of the pipe receiving the jacking thrust will be required.

B. Jacking Pit

1. The approach trench for jacking or boring operations shall be adequately shored to safeguard existing substructures and surface improvements and to ensure against ground movement in the vicinity of the casing portal.

2. Place in the approach trench of jacking pit and firmly bed on the required line and grade heavy guide timbers, structural steel, or concrete cradle of sufficient length to provide accurate control of jacking alignment. Provide adequate space to insert the casing lengths to be jacked. Anchor the timbers and structural steel sections to ensure action of the jacks in line with the axis of the casing. Place a timber or structural steel bearing block between the jacks and the end of the casing to provide uniform bearing upon the casing end evenly distribute the jacking pressure.

3. Provide bracing, shoring and ladders necessary to meet trench safety requirements. Confined space testing may be required as conditions dictate.

C. Control of Alignment and Grade

Control the application of jacking pressure and excavation of material ahead of the advancing casing to prevent it from becoming friction bound or deviating from required line and grade, as detailed in the plans. Do not encroach upon the minimum annular space detailed. Restrict the excavation of material to the least clearance necessary to prevent binding in order to avoid settlement or possible damage to overlying structures or utilities.

D. Grouting

Immediately after completion of the jacking or boring operation, lean grout shall be injected through the grout connections of casings 30-inches and larger in a manner that will completely fill all voids outside the casing pipe resulting from the jacking or boring operation. The lean grout shall consist of one part Portland cement, four parts sand, and sufficient water to produce a workable mixture. Grout pressure is to be controlled so as to avoid deformation of the casing and/or avoid movement of the surrounding ground. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and not less than 35% will pass a No. 50 sieve. After completion of grouting, the grout connections shall be closed with cast-iron threaded plugs.

E. Installation of Carrier Pipe

1. The carrier pipe shall be pushed into the casing pipe using stainless steel casing spacers, which shall be sized to restrain the pipe from moving within the casing. If the casing has

deviated from the design line and grade; specifically fabricated casing spacers may be used to correct the problem.

2. The casing pipe spacers shall be place so as to support all of the carrier pipes within two feet or less of the end of the casing pipe. Unless noted otherwise in the plans, casing pipe spacers shall be placed at a minimum of one at the bell end and one at the center of each length of pipe.

3. Before sealing the carrier pipe ends, the carrier pipe shall pass an initial pressure test per Section 15042 or leakage test per Section 15043.

F. Sand Backfill for Annular Space in Jacked Casing

1. Use air-blown sand to fill the annular space between the casing and the carrier pipe unless otherwise required by the agency having jurisdiction over the road or railroad crossing.

2. Furnish the necessary sand, air compressor, hoses, pressure gauges, valves, and fittings for the filling operation.

3. Air blown sand shall conform to the requirements for imported sand in Section 02223. Sand shall be free of lumps when put into the hopper. Sand shall be of a consistency to flow unimpeded and completely fill all voids.

4. Place a bulkhead for retaining the sand in the annular space between the casing and the carrier pipe at each end of the jacked casing. At the start of the sand fill operation, extend the sand discharge pipe from the placing equipment, through the inside of the casing, and to the bulkhead at the remote end of the casing. The method used to place the sand shall be such to ensure complete filling of the annular space. During placement, position the sand discharge pipe so that its discharge end shall be kept well buried in the sand at all times after the sand has been built up over the crown of the pipe at the remote end of the section being filled. Install a riser pipe suitable for a vent in the casing adjacent to the bulkhead at the near end of the casing. Plug the vent pipe with grout upon completion of sand filling.

G. Sealing Ends of the Casing

The ends of the casing pipe shall be sealed with a rubber shroud, held in place with stainless steel straps, as shown on MCWD Standard Plan W-19 or S-11. The diameters and lengths of the end seals shall be sized to fit each casing pipe and carrier pipe to assure a positive barrier to backfill debris and seepage.

H. Installing Sacrificial Anodes for Cathodic Protection

1. The size and number of anodes is determined by the soils resistivity, the amount of metal surface area and the desired service life of the anode and shall be determined by the Engineer. A minimum of one sacrificial anode shall be buried at each end of the casing.

2. Lead wire shall be cadwelded to the casing in accordance with Erico Engineering specification No. A160-A05.

3. Cover each weld with Royston “Handy Cap.”

4. Each anode shall be saturated with 20 gallons of water, prior to backfill of the trench.

I. Closing the Jacking Pit

After jacking equipment and muck from the tunnel have been removed from the approach trench of jacking pit, prepare the bottom of the jacking pit as a pipe foundation. Remove all loose and disturbed material below pipe grade to undisturbed earth and recompact the material in accordance with Section 02223.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 02701**

# INSTALLATION OF GRAVITY SEWER PIPELINES

## PART 1 - GENERAL

A. Description

This section describes the installation of gravity sewer pipelines fabricated of polyvinyl chloride (PVC).

B. Related Work Described Elsewhere

| | | |
|---|---|---|
| 1. | Trenching, Backfilling and Compacting: | 02223 |
| 2. | Jacked Casing: | 02315 |
| 3. | PVC Gravity Sewer Pipe: | 02715 |
| 4. | Concrete: | 03300 |
| 5. | Precast Concrete Manholes and Manhole Bases: | 03461 |
| 6. | Leakage and Infiltration Testing: | 15043 |
| 7. | Ductile Iron Pipe and Fittings: | 15056 |

C. Submittals

1. An installation schedule (tabulated layout) shall be submitted which includes:
    a. Order of installation and closures
    b. Pipe centerline station and elevation at each change of grade and alignment
    c. Locations of manholes

## PART 2 - MATERIALS

A. Installation Material

Refer to Section 02715, PVC Gravity Sewer Pipe for material requirements.

B. Piping Schedule

Unless noted otherwise on the plans or in the specifications, pipe shall be furnished in accordance with the following materials schedule.

| **DIAMETER** | **GRAVITY SEWER** |
|---|---|
| 2-inch and smaller | -- |
| 4-inch through 21-inch | PVC SDR-35 |
| 24-inch through 36-inch | DIP with polyethylene lining |
| Notes: PVC SDR-35 - PVC gravity sewer pipe per Section 02715.<br>DIP - Ductile iron pipe per Section 15056. | |

**PART 3 - EXECUTION**

A. Delivery and Temporary Storage of Pipe at Site

1. Onsite Storage Limitation: Onsite pipe storage shall be limited to a maximum of one week, unless exception is approved by District.

2. Care of Pipe: At times when the pipe laying is not in progress, the open end of the pipe shall be closed with a tight-fitting cap or plug to prevent the entrance of foreign matter into the pipe. These provisions shall apply during the noon hours as well as overnight. In no event shall the sewers be used as drains for removing water which has infiltrated into the construction trenches.

B. Handling of Pipe

1. Moving Pipe: Pipes shall be lifted with handling beams or wide belt slings as recommended by the pipe manufacturer. Cable slings shall not be used. Pipe shall be handled in a manner to avoid damage to the pipe. Pipe shall not be dropped or dumped from trucks or into trenches under any circumstances.

2. Inspection Pipe: The pipe and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound pipe shall be repaired or replaced. All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench.

C. Placement of Pipe in Trench

1. General: All pipe shall be laid without a break, upgrade from structure to structure, with the bell ends of the pipe upgrade. Pipe shall be laid to the line and grade given so as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the flow line.

2. Trench Excavation: Dewatering, excavation, shoring, sheeting, bracing, backfill material placement, material compaction, compaction testing, and pipe laying requirements and limitations shall be in accordance with Section 02223, Trenching, Backfilling, and Compacting.

3. Pipe Bedding Thickness: Unless shown otherwise on the drawings, pipe bedding material shall be 3/4-inch crushed rock for PVC pipe specified in Section 02223, Trenching, Backfilling, and Compacting or compacted backfill material per Section 02223.

4. Subgrade at Joints: At each joint in the pipe, the pipe subgrade shall be recessed in firm bedding material so as to relieve the bell of the pipe of all load and to ensure continuous bearing along the pipe barrel.

5. Cleaning: The interior of the sewer pipe shall be cleaned of all dirt and superfluous materials as the work progresses.

6. Joints: The mating surfaces of the pipe to be joined shall be wiped clean of all dirt and foreign matter and a lubricant applied that is approved by the pipe manufacturer. Then, with the surfaces properly lubricated, the spigot end of the pipe shall be positioned inside the bell and the joint shoved home.

   For larger diameter pipe where a lever attachment is required, the necessary precautions shall be taken to insure an undamaged pipe installation.

7. Pipe Alignment: Unless specified otherwise, pipeline line and grade shall be as shown on the plans. Grade shall be measured along the pipe invert.

8. PVC Pipe Curvature: Construction of curved reaches of PVC pipe shall not be accomplished by deflecting joints or by beveling pipe ends. Bending of PVC pipe to achieve vertical or horizontal curves without using deflection fittings shall be limited as follows:

| Diameter (Inches) | Minimum Radius (Feet) |
|---|---|
| 6 | 210 |
| 8 | 280 |
| 10 | 350 |
| 12 | 420 |

9. Laterals: PVC wyes and other types of branches shall be furnished and installed along with the PVC sewer. Wyes sized as specified on the plans shall be installed for all sewer house connections and for future sewer house connections as shown on the plans. The longitudinal barrel of branch fittings, to be placed in line and grade with the sewer mains, shall be of the same diameter, quality, and type as specified herein for sewer installations. Earthwork and bedding for branches and shall conform to the applicable provisions set forth in the specification for each pipe material. The branch of wye fittings shall be inclined upward at an angle not greater than 45 degrees from a horizontal line for sewer lines up to ten feet deep, and no more than 60 degrees for sewers deeper than 10 feet. No wye for sewer house connection branch shall be placed closer than 5 feet downstream of the centerline of any structure. The contractor shall place a support of graded crushed rock or imported sand under every wye branch when installed. The support shall be placed in accordance with the detail on the plans or as specified in Section 02223, Trenching, Backfilling, and Compacting.

10. Backfill: Backfill shall be placed and compacted in accordance with the requirements of Section 02223, Trenching, Backfilling and Compacting, and as shown on MCWD Standard Plan S-5. Backfill within the pipe zone shall be ¾-inch crushed rock for PVC pipe.

D. Manholes and Manhole Bases

Precast concrete manholes and manhole bases shall be constructed in accordance with Section 03461, Precast Concrete Manholes and Manhole Bases, as shown in the plans or on MCWD Standard Plan Nos. S-1, S-2, and S-3.

E. House Laterals

1. Locations: House laterals and wye branch fittings of the size indicated on the plans shall be installed at the locations shown on the plans or at the location furnished by the District representative.

2. Plugged Branches: All branch fittings that are to be left unconnected shall be plugged.

3. Fittings: House laterals shall be joined to wye branch fittings at the sanitary sewer main as set forth above by eighth bends. All eighth bends and sixteenth bends are a part of house lateral sewerline.

4. Alignment: Where possible, all house laterals shall run perpendicular to the sewer main from the main to the property line, and all house laterals shall be bedded the same as the sewer main into which they connect.

5. Plugged House Laterals: All house laterals shall be plugged with an approved stopper in the socket of the last joint of each house lateral so that it will withstand the internal pressure during the test for leakage, per Section 15013, but also in such a manner that it may be removed without injury to the socket.

6. Marking: The contractor shall mark the location of each house lateral at its upper end by chiseling a letter "S" 1-1/2-inches high on the face of the curb.

7. Chimney Connections: Chimney connections are not allowed.

8. Mainline Testing: The mainline sewer shall have passed final testing per Section 15043 before the laterals may be connected to the main.

F. Cleanouts

1. Limitations: Sewer clean-outs of the size indicated on the plans shall be installed at the locations shown on the plans or at the location furnished by the District representative. The use of cleanouts shall be limited to the following instances unless approved otherwise by the District engineer.

    a. Short sections of sewer main, less than 250-feet that will be extended.

    b. All commercial and industrial sewer lateral installations at the property line.

    c. Between manholes, if there is a reverse curve in the sewer main, to facilitate cleaning of the main line.

d. Special instances such as on a sewer lateral to a single family residential lot where the dwelling unit is set back more than 100-feet from the property line, where there is a large slope up to the building pad from the property line, and a grade change in the lateral is necessary, or where the sewer lateral enters the rear of the lot from a public right-of-way.

e. On a lateral where the overflow level of the lowest wastewater fixture in the building is below the rim elevation of the uphill sewer manhole on the main line. In this situation the rim elevation of the cleanout installed at the property line shall be at least 6-inches below the overflow elevation of the lowest wastewater fixture on the lateral. A backflow prevention device is required on the lateral per Section 4.11 of the District's Code.

2. Size: Cleanouts shall be PVC pipe and shall be the same size as the line on which they are installed. Cleanouts shall be constructed as shown on the MCWD Standard Plan S-8.

G. Saddle Connections

1. General: All saddle connections of new laterals into existing sewer lines shall be made with a wye saddle.

2. Scoring and Tapping: The sewerline to be saddled shall be scored to the approximate shape of wye or tee and shall be cut with a hole cutter. The tap holes shall be cleanly machined and may be further worked by hand to provide a true and neat opening for the collar wye or tee saddle. Pipe damaged during this operation shall be repaired or replaced. The District representative shall be the sole judge as to the method of repair or replacement.

3. Securement: The collar wye shall be secured to the sewer main with a catalytic epoxy resin. The saddle shall be tied to the main with wire of sufficient strength that no movement will occur during the setting of the epoxy resin.

4. Encasement: After the connection has set sufficiently long for the epoxy resin to cure, the District will inspect the connection and, if satisfactory, the contractor shall encase the fitting with Class B Portland cement concrete to the limits indicated on MCWD Standard Plan S-97.

5. Cleaning: The saddling operation shall be carried out in a workmanlike manner. Chips, dirt, epoxy mortar, and concrete shall be kept out of the sewer line being saddled. If directed by the District representative, the reach of sewer main saddled shall be flushed and cleaned using a hydrocleaner or vacuum truck.

6. Alternative Connection: In lieu of a saddle connection, a wye connection may be made by cutting the sewer and installing a wye.

H. Installation Within Jacked Casing

1. General: The sewer pipe shall be installed within the casing pipe to the lines and grades shown on the plans and in accordance with Section 02315, Jacked Casing.

2. Pipe Support: The carrier pipe shall be supported on cradles such as "PSI" spacers, Model C8G-2, or approved equal before backfilling, in such a manner as to relieve the pipe bells from any bearing loads.

3. Fill Within the Casing: The annular space between the casing and the carrier pipe shall be backfilled per Section 02315, Jacked Casing.

4. Testing: Before backfilling as specified above, the sewer carrier pipe shall pass an initial test for leakage as provided in Section 15043, Leakage and Infiltration Testing.

I. Pipe Anchorage (For Pipelines Having a Diameter of 10-Inches or Less)

1. General: Concrete slope anchors shall be installed where shown on the plans in accordance with Section 03300 and MCWD Standard Plan S-10, wherever the profile of the ground surface above the sewer main exceeds 20 percent, and where no pavement or other surfacing is to be laid over the facility.

2. Dimensions: Anchors shall be a minimum of 12-inches thick and shall extend at least 12-inches into undisturbed material on each side of the trench as excavated.

3. Slope Protection: Cemented rubble and concrete surface slope protection shall be a minimum of 4-inches thick.

4. Spacing: Spacing between pipe anchors shall not exceed the distances shown on MCWD Standard Plan S-10.

5. Reinforcement for Concrete Anchors: Anchors constructed of cast-in-place reinforced concrete shall have No. 4 reinforcing bars placed at 6-inches on center each way in the center of the anchor thickness. The bars shall extend full length and height of the anchor.

6. Reinforcement for Concrete Masonry Unit Anchors: Reinforced hollow masonry units shall have all cells filled solidly with grout. A No. 4 reinforcing bar shall be placed vertically in each row of cells and No. 9 gage wall mesh shall be placed in each horizontal joint. In addition, a bond beam shall be placed at the top with two No. 4 bars.

J. Concrete Encasement

Unless shown otherwise, concrete for encasement shall be reinforced or unformed or rough formed, and of the class as designated on the plans. Concrete shall be in accordance with Section 03300, Concrete. Concrete used for encasing, cradling, bedding, cover for pipe, or other objects shall be used as shown on the Plans, on MCWD Standard Plan S-9, or as directed by the District representative.

K. Cleaning

Before testing, each pipe shall be thoroughly cleaned from manhole to manhole with a sewer scrubbing ball, and all debris and trash shall be removed from each manhole.

L. Mandrel Test for PVC Gravity Sewers 10-inch in Diameter and Smaller

Following placement and compaction of backfill for all utilities, and prior to the placement of permanent pavement, all sewer mains shall be cleaned and mandrelled to verify that the pipeline

is free from obstructions (deflections, joint offsets, lateral pipe intrusions, etc.) in accordance with Section 15043.

M. Leakage and Infiltration Test

The pipe, manholes, and other appurtenances shall be tested for leakage and infiltration per Section 15043, Leakage and Infiltration Testing.

N. Closed-Circuit Television Inspection

1. General: In addition to the regular leakage and infiltration test, the entire length of all new sewer lines shall be inspected by the contractor using closed-circuit television equipment. The inspection shall be conducted after the line has been successfully tested and prior to paving. The inspection shall be conducted in the presence of the District representative. For pipe lengths designed to absolute minimum design slopes (See Section 500-2 of the Procedural Guidelines), video inspection shall provide a profile of the sewer line.

2. Responsibility: All labor and equipment necessary to conduct this inspection shall be furnished by the contractor.

3. Notification: Requests for sewer line inspection shall be made to the District representative a minimum of two working days in advance of the requested inspection date.

4. Flushing: Each sewer section shall be flushed with water being introduced at the upstream manhole of each section prior to video recording.

5. Stationing: The video shall show stationing corresponding to sewer stationing shown on plans for each manholes and Wye location.

6. Submittal: The videotape shall be VHS format and be submitted to the District with two (2) of the computer printouts showing manhole numbers and stationing, wye stationing and distance between manholes prior to occupancy release for the dwelling units being served by the sewer. The tape and printout shall be labeled with the project name, tract number, street names, and contractor's name and shall list the station of any defects, dirt, low spots, etc. in the pipe.

7. Repair of Defects: Even though the sewer line may have successfully passed the leakage and infiltration tests, any defects or low spots in the line shall be repaired to the satisfaction of the District.

8. Acceptance: Sewer section having standing water or defects shall be repaired by the contractor prior to District acceptance and prior to occupancy release for the dwelling units or commercial site being served by the sewer. Standing water in the system will not be allowed.

O. Final Inspection

After paving has been completed and all manholes raised to grade, a final visual inspection shall be made. The necessary labor shall be furnished to assist the District representative in making the final inspection. Additional balling may be required if the lines are dirty, even though lines were previously balled. The contractor shall furnish a responsible person or supervisor for the final inspection to remove manhole covers and to note any corrections required by the District representative in order to obtain final approval. Final District inspection shall be requested through the District representative by giving at least two day's notice.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 02715**

**PVC GRAVITY SEWER PIPE**

## PART 1 - GENERAL

A. Description

This section includes materials, testing, and installation of polyvinyl chloride (PVC) gravity sewer pipe and fittings.

B. Related Work Specified Elsewhere

| | | |
|---|---|---|
| 1. | Trenching, Backfilling and Compacting | 02223 |
| 2. | Jacked Casing: | 02315 |
| 3. | Installation of Gravity Sewer Pipelines: | 02701 |
| 4. | Concrete: | 03300 |
| 5. | Precast Concrete Manholes and Manhole Bases: | 03461 |
| 6. | PVC Distribution Pipe: | 15064 |

C. Submittals

1. Provide materials list showing material of pipe and fittings with ASTM references and grade.

2. Provide certificates of compliance with all standards referenced in this section.

D. Application

PVC SDR 35 shall be used for gravity sewer mains up to and including 12-inch in diameter, except as specifically called out on the project plans.

E. Sewer Force Mains

PVC sewer force mains shall be constructed in accordance with the requirements for PVC Distribution Pipe, Section 15064.

F. Inverted Siphons

Inverted siphons of the size indicated on the plans shall be installed at the locations shown on the plans or at the locations approved by the District Engineer.

## PART 2 - MATERIALS

A. Pipe and Fittings

1. ASTM Requirements: Pipe, fittings, couplings, and joints shall be in conformance with the size, material and performance requirements of ASTM D 3034, SDR 35, and shall have gasketed joints. Pipe shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13364-B as defined in ASTM D 1784. Fittings shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13343-C. All pipe shall be of solid wall construction with smooth interior and exterior surfaces.

2. Manufacturer's Testing Certification: During production of the pipe, the manufacturer shall perform the specified tests for each pipe marking. A certification by the manufacturer indicating compliance with specification requirements shall be delivered with the pipe. The certification shall include the test result data.

3. Pipe Marking: All pipe, fittings, and couplings shall be clearly marked at an interval not to exceed 5-feet as follows:

   a. Nominal pipe diameter

   b. PVC cell classification

   c. Company, plant, shift, ASTM, SDR, and date designation

   d. Service designation or legend

   For fittings and couplings, the SDR designation is not required. All pipe shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

4. Additional Pipe Tests Following Delivery: When pipe is delivered to the jobsite, the District representative may require additional testing to determine conformance with the requirements of pipe flattening, impact resistance, pipe stiffness, and extrusion quality. When testing is required, one test pipe shall be selected at random by the engineer from each 1,200 feet or fraction thereof of each size of pipe delivered to the jobsite but not less than one test pipe per lot. A lot shall be defined as pipe having the same identification marking. The length of specimen for each selected pipe shall be a minimum of 8-feet.

5. Pipe Retest: Pipe which is not installed within 120 days of the latest test shall not be used without prior approval of the District representative.

6. Fitting and Coupling End Configurations: The socket and spigot configurations for fittings and couplings shall be compatible with those used for the pipe.

7. Manufacturers: Pipe shall be as manufactured by J-M Manufacturing Ring-Tite, Vinyltech, P W Pipe, Diamond Plastics, Carlon, or approved equal. Fittings shall be as manufactured by J-M Manufacturing, GPK Products, or approved equal.

B. Gaskets for PVC Pipe

1. General: Unless otherwise specified, gaskets shall be manufactured from a synthetic elastomer, and shall be extruded or molded and cured in such a manner as to be dense,

homogeneous and of smooth surface, free of pitting, blisters, porosity, and other imperfections. The compound shall contain not less than 50 percent by volume of first-grade synthetic rubber. The remainder of the compound shall consist of pulverized fillers free of rubber substitutes, reclaimed rubber, and deleterious substances. The tolerance for any diameter measured at any cross section shall be ±1/32-inch (.8mm).

2. Gasket Material Requirements: When required by the District representative, the contractor shall furnish test samples of gaskets from each batch used in the work. Gasket material shall meet the following requirements:

| **Property** | **Value** | **ASTM Test Method** |
|---|---|---|
| Tensile Strength (min. psi) | 2,000 | D 412 |
| Elongation at break (% min.) | 350 | D 412 |
| Shore durometer, Type A<br>(Pipe manufacturer shall select value suitable for type of joint) | 40 to 65* | D 2240 |
| Compression set (constant deflection) max % of original deflection | 16 | D 395 |
| Compression strength after oven aging (96 hours, 158°F {70°C}) % of tensile strength before aging | 80 | D 573 |
| Increase in Shore durometer hardness after oven aging. Maximum increase over original Shore durometer | 10 | D 2240 |
| Physical requirements after exposure to ozone concentration (150 pphm. 70 hours, 140°F {40°C}), 20% strain) | No Cracks | D 1149 |

*This applies only to the sealing component of the gasket.

3. Splices: No more than one splice will be permitted in a gasket. A splice shall be made by applying a suitable cement to the ends and vulcanizing the splice in a full mold. The splice shall show no separation when subjected to the following tests:

4. Elongation Test: The part of the gasket which includes the splice shall withstand 100% elongation with no visible separation of the splice. While in the stretched position, the gasket shall be rotated in the spliced area minimum of 180 degrees in each direction in order to inspect for separation.

5. Bend Test: The portion of the unstretched gasket containing the splice shall be wrapped a minimum of 180 degrees and a maximum of 270 degrees around a rod of a diameter equal to the cross section diameter of the gasket.

## PART 3 - EXECUTION

A. Related Installation Specification

PVC gravity sewer pipe shall be installed in accordance with the requirements of Section 02701, Installation of Gravity Sewer Pipelines.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 03300**

**CONCRETE**

## PART 1 - GENERAL

A. Description

This section describes concrete materials, mixing, placement, form work, reinforcement and curing.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

Structure Excavation: 02200

C. Submittals

1. Shop drawings shall be submitted in accordance with the General Provisions, ACI 318, and the following.

2. Mix design with proof of design by laboratory 7-day and 28-day compressive testes, or test reports of 7-day and 28-day compressive tests of the mix where the same mix was used on two previous projects, shall be submitted in writing for review by the district at least 15 days before placing of any concrete.

3. Certificate that cement used in the concrete complies with ASTM C 150 and these specifications shall be submitted.

4. Aggregates: Certificate of compliance with ASTM C 33 shall be provided. Weathering region limits of coarse aggregates: sever, moderate, or negligible shall be stated. Basis of determining that potential reactivity is negligible shall be stated.

5. Ready Mix Concrete: Delivery tickets or weighmasters certificate per ASTM C 94, including weights of cement and each size aggregate, volume of water in the aggregate, and volume of water added at the plant shall aggregate, and volume of water added at the plant shall be provided. The volume of water added on the job shall be written on the ticket or certificate.

6. Concrete admixtures: Manufacturer’s certificate of compliance with there specification shall be provided.

7. Epoxy Bonding Compound: Manufacturer’s specific instructions for use shall be provided.

8. Nonshrink Grout: Manufacturer's certificate of compliance with these specifications and specific instruction for use shall be provided.

## PART 2 - MATERIALS

A. Concrete

1. All Portland cement concrete shall conform to the provisions of Section 201 of the SS PWC except as herein modified.

2. Portland cement concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, and water proportioned and mixed to produce a smooth dense workable mixture. It can be of the ready-mix variety as produced by any reliable ready-mix concrete firm.

3. Portland cement, including Portland cement used in precast products, shall be Type V conforming to ASTM C 150.

4. Concrete mix design shall conform with ASTM C 94. Use classes of concrete as described in the following table.

| Class | Type of Work | 28-Day Compressive Strength (in psi) | Minimum Cement Content (in lbs. Per C.Y.) |
|---|---|---|---|
| A (560-C-3250) * | Concrete for all reinforced structures, piers, vaults, manhole bases, thrust blocks, encasements, slope protection | 3,000 | 564 (6 sack) |
| B (450-C-2000) * | Concrete for anchors, cutoff walls, cradles and miscellaneous unreinforced concrete | 2,000 | 470 (5 sack) |

*concrete class per SS PWC

B. Reinforcing Steel

1. Reinforcement shall conform to ASTM A 615, Grade 40.

2. Fabricate reinforcing steel in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Bend reinforcing steel cold.

3. Deliver reinforcing steel to the site bundled and tagged with identifying tags.

C. Welded Wire Fabric

Welded wire fabric shall conform to ASTM 185.

D. Tie Wire

Tie wire shall be 16-gage minimum, black, soft annealed.

E. Bar Supports

Bar supports in beams and slabs exposed to view after form stripping shall be galvanized or plastic coated. Use concrete supports for reinforcing in concrete placed on grade.

F. Forms

1. Forms shall be accurately constructed of clean lumber and shall be of sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure and tamping without deflection from the prescribed lines.

2. The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure.

**PART 3 - EXECUTION**

A. Excavation

Excavation for structures shall be in accordance with Section 02200.

B. Form Work

1. The contractor shall notify the District representative a minimum of one working day before the placement of concrete to enable the District representative to check the form lines, grades, and other required items for approval before placement of concrete.

2. Unless otherwise indicated on the plans, all exposed sharp edges shall be chamfered with at least 3/4 - by 3/4-inch triangular fillets.

3. Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities.

C. Reinforcement

1. Place reinforcing steel in accordance with the current edition of "Recommended Practice for Placing Reinforcing Bars," published by the Concrete Reinforcing Steel Institute.

2. All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings or prescribed by the District representative.

3. Do not straighten or rebend reinforcing steel in a manner that will injure the material. Do not use bars with bends not shown on the drawings.

4. All bars shall be free from rust, scale, oil, or any other coating which would reduce or destroy the bond between concrete and steel.

5. Position reinforcement steel in accordance with the drawings and secure by using annealed wire ties or clips at intersections and support by concrete or metal supports, spacers, or metal hangers. Do not place metal clips or supports in contact with the forms. Bend tie

wires away from the forms in order to provide the specified concrete coverage. Bars additional to those shown on the drawings, which may be found necessary or desirable by the contractor for the purpose of securing reinforcement in position, shall be provided and paid for by the contractor.

6. Place reinforcement a minimum of 2 inches clear of any metal pipe or fittings.

7. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

8. All reinforcing steel and wire mesh shall be completely encased in concrete.

9. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.

10. Minimum lap for all reinforcement shall be 20 bar diameters.

11. Place additional reinforcement around the pipe or opening as indicated in the drawings.

12. Wire mesh reinforcement is to be rolled flat before being placed in the form. Support and tie wire mesh to prevent movement during concrete placement.

13. Extend welded wire fabric to within 2 inches of the edges of the slab. Lap splices at least 1-1/2 courses of the fabric and a minimum of 6 inches. Tie laps and splices securely at ends and at least every 24 inches with 16-gage black annealed steel wire. Pull the fabric into position as the concrete is placed by means of hooks, and work concrete under the steel to ensure that it is at the proper distance above the bottom of the slab.

D. Embedded Items

All embedded bolts, dowels, anchors, and other embedded items shall be held correctly in place in the forms before concrete is placed.

E. Mixing and Placing Concrete

1. Concrete, either commercial of on-site ready mix or batch mixed, shall be placed in the forms before taking its initial set.

2. No concrete shall be placed in water except with permission of the District representative.

3. As the concrete is placed in the forms, or in excavations to be filled with concrete, it shall be thoroughly settled and compacted throughout the entire layer by internal vibration and tamping bars.

4. All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet, and grouted before the concrete is deposited.

F. Concrete Finishing

1. Immediately upon the removal of forms, all voids shall be neatly filled with cement mortar.

2. The surfaces of concrete to be permanently exposed to view must be smooth, free from projections, and thoroughly filled with mortar.

3. Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screened to a uniform surface and worked with suitable tools to a smooth mortar finish.

G. Protection and Curing of Concrete

The contractor shall protect all concrete against damage. Exposed surfaces of new concrete shall be protected from the direct rays of the sun and from frost by being kept damp for at least two weeks after the concrete has been placed, or by using the "Hunt White Coverage" process or approved equal.

H. Backfill

Backfill around structures shall be in accordance with Section 02200.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 03461**

# PRECAST REINFORCED CONCRETE MANHOLES AND MANHOLE BASES

## PART 1 - GENERAL

A. Description

This section includes materials, testing, and installation of precast concrete manholes, manhole bases, manhole frames and covers.

B. Related Work Specified Elsewhere

| | | |
|---|---|---|
| 1. | Structure Earthwork: | 02200 |
| 2. | Trenching, Backfilling, and Compacting: | 02223 |
| 3. | Concrete: | 03300 |
| 4. | Leakage and Infiltration Testing: | 15043 |

C. Submittals

1. Submit manufacturer's catalog and test data on precast concrete manholes, frames, and covers along with installation recommendations for inlet and outlet seals and watertight caulking. Show dimensions and materials of construction by ASTM reference and grade. Show manhole cover lettering and pattern.

## PART 2 - MATERIALS

A. Precast Concrete Manholes

1. General: Precast reinforced concrete manholes shall comply with ASTM C 478, with a minimum wall thickness of 5-inches.

2. Design Load: Manhole components shall be designed for H-20 highway loads and site soil conditions.

3. Concrete: Precast reinforced concrete manhole risers and tops shall be constructed of Class A concrete with Type V cement per Section 03300, Concrete.

4. Manhole Section Configuration: Manholes shall be fabricated only from concentric taper sections and standard cylinder units of the proper internal diameter.

5. Manhole Section Dimensions: Unless noted otherwise, minimum diameter and wall thickness of manholes and manhole sections shall be as follows:

| Depth, feet | Manhole Diameter, in | Manhole Section Wall Thickness, inches |
|---|---|---|
| 0 – 6.0 | 48 | 5 |
| 6.1 – 15.9 | 60 | 8 |
| 16 - 22 | 72 | 9 |

Depth of cover shall be measured from proposed finish surface elevation to the lowest pipe invert.

6. Steps: Manhole sections shall be furnished without steps.

7. Drop Manholes: Drop manholes of greater than 1-ft are not permitted without the District Engineer's approval. The contractor shall provide odor control devices for drop manholes as directed by the District Engineer.

8. Manufacturers: Precast reinforced concrete manholes shall be manufactured by Jensen Precast, Ameron, Southwest Concrete Products, Inland Concrete Products, Hansen, Precon Products, or approved equal.

B. Manhole Frames and Covers

1. General Requirements: Manhole frames and covers shall be made of ductile iron conforming to ASTM A 536, Class 400, or cast iron conforming to ASTM A 48, Class 30. Casting shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Frames and covers shall be of the traffic type, designed for H-20 loading.

2. Fit and Matchmarking: Each manhole cover shall be ground or otherwise finished so that it will fit in its frame without rocking. Frames and covers shall be matchmarked in sets before shipping to the site.

3. Cover Inscription: Covers shall have "MCWD" and the word "SEWER" cast thereon as shown in MCWD Standard Plan S-4 or on the plans. No other lettering on the top side shall be permitted.

4. Inspection and Coating: Before leaving the foundry, castings shall be cleaned and subjected to a hammer inspection. Castings shall then be dipped twice in a preparation of asphalt or coal tar and oil applied at a temperature of not less than 290°F, not more than 310°F, and in such a manner as to form a firm and tenacious coating.

5. Manufacturers: Manhole frames and covers shall be manufactured by Neenah Foundry, Long Beach Iron Works, Alhambra Foundry, South Bay Foundry or approved equal.

C. Imported Sand

Imported sand shall comply with Section 02223, Trenching, Backfilling, and Compacting.

D. Crushed Rock

Crushed rock shall comply with Section 02223, Trenching, Backfilling, and Compacting. If crushed rock is not used for the pipe bedding, 3/4-inch crushed rock shall be used for the manhole. Crushed rock base material shall extend 1 foot beyond the outside edge of the concrete manhole base.

E. Manhole Bases

Concrete used in pouring the manhole base shall be Class A concrete, Type V cement per Section 03300, Concrete. Precast manhole bases are acceptable in lieu of field formed manhole bases with the approval of the District Engineer.

F. Manhole Linings

When required by the District Engineer, manholes shall be lined with PVC "T-Loc" liners installed per manufacturer's guidelines and as required by the Engineer.

G. Cement-Mortar Grout

Grout for watertight joints between precast sections shall be composed of one part Portland cement to two parts of clean well-graded sand of such size that all pass a No. 8 sieve. Cement, aggregate, and water for mortar shall conform to the applicable provisions of Section 03300, Concrete.

H. Epoxy Grout

Epoxy grout shall be used in repairing manhole and manhole base surfaces. Epoxy grout shall be made with epoxy and sand. The sand shall be clean, bagged, graded, and kiln dried silica sand. The prepared grout shall wet the contact surface and provide proper adhesion, or a coat of epoxy shall be applied prior to placing the epoxy grout. The epoxy bonding compound shall be as specified in Section 03300, Concrete.

I. Plastic Joint Sealing Compound

Preformed cold-applied ready-to-use plastic joint sealing compound shall be Quick-Seal "Ramnek" as supplied by Utility Vault, Santa Ana, California, or approved equal.

## PART 3 - EXECUTION

A. Work Within Existing Manholes

Any proposed work inside an existing manhole that is part of a sewerage system in service, shall not be undertaken until all the tests and safety provisions of Article 4, Section 1532 "Confined Spaces" State of California Construction Safety Orders have been made.

B. Excavation

Excavation for the precast concrete manhole shall be in accordance with Section 02223, Trenching, Backfilling, and Compacting.

C. Manhole Base

1. General: Manhole bases shall be poured in place against undisturbed soil with Class A concrete having 3/4-inch-maximum size aggregate and a slump of not greater than 2-inches. The manhole base shall be poured as one monolithic pour. Limitations for site-mixed and ready-mixed concrete set forth in Section 03300, Concrete, shall be observed. A 12-inch thick base of 3/4-inch crushed rock shall be placed prior to the placement of concrete for all installations.

2. Manhole Stub Placement: The manhole stubs and sewer main shall be set before the concrete is placed and shall be rechecked for alignment and grade before the concrete has set. The various sized inlets and outlets to the manhole shall be located as indicated on the plans and as detailed in the detail drawings.

3. Matching Pipe Crown Elevations: Invert elevations of connecting sewers many vary depending upon sizes. The crown elevation of all pipes shall be the same as the crown elevation of the largest pipe unless otherwise indicated on the plans.

4. Channel Configuration: The invert of the manhole base shall be formed so as to provide smooth channels conforming in size and shape to the lower portions of the inlet and outlet pipes. The channel shall vary uniformly in size and shape from inlet to outlet, and a shelf shall be constructed higher than the pipe as indicated on the drawings. The manhole base shall extend 12-inches below the bottom of the lowest pipe.

5. Transitions: All transitions shall be smooth and of the proper radius to give an uninterrupted transition of flow.

6. Finishing: The concrete base shall be shaped with a wood float and shall receive a hard steel trowel finish before the concrete sets.

7. Placement of Additional Mortar: In the event additional mortar is required after initial set has taken place, the surface to receive the mortar shall be primed, and the mortar mixed with "Willhold Concrete Adhesive" in the amounts and proportions recommended by the manufacturer and as directed by the District representative in order to secure as chip-proof a result as possible.

8. Curing Time Before Further Construction: Unless approved otherwise by the District Engineer, in advance, the bases shall set a minimum of 24 hours before the manhole construction is continued.

9. Manhole Barrel Impression Ring shall be used to mold a groove into the base to match the manhole barrel.

D. Pre-Cast Manhole Base

E. Installing Manholes

1. General: Manholes for sewers of diameter 12-inches or less shall be constructed as shown on MCWD Standard Plans S-1, S-2, and S-3. Manholes for larger diameter sewers shall be constructed as shown on the project construction plans.

2. Joints: Precast concrete manhole units shall be set in a bed of grout to make a watertight joint at least 1/2 inch thick with the concrete base or with the preceding unit. Manhole sections shall be set perfectly plumb. Inside joints shall be pointed and the excess grout wiped off. Preformed, cold-applied, ready-to-use, plastic joint sealing compound may be substituted for grout between units and must be used when groundwater is encountered.

3. Finish Elevation of Manhole Covers: Precast sections shall be assembled so that the cover conforms to the elevation determined by the manhole location as follows, but limited to a maximum of 18-inches from the top of the manhole cone to the top of the ring and cover, unless otherwise instructed by the District representative.

    a. In Paved Area: Top of cover shall be flush with the paving surface.

    b. In Shoulder Areas: Top of cover shall be flush with existing surface where it is in traveled way or shoulder and 0.1 foot above existing surface where outside limits of traveled way but not in the existing roadside ditch.

    c. In Roadside Ditch or Unpaved Open Areas: Top of cover shall be a minimum of 6-inches above the ground surface and surrounded with a concrete collar, per MCWD Standard Plans S-1. In special instances, as designated by the District representative or as shown on the plans, the top of the cover shall be flush with the surrounding ground surface and within a square concrete pad 2 feet larger than the manhole frame. Guard posts or paddle boards may be required adjacent to manholes in open areas.

4. Manhole Frame and Cover: The manhole frame shall be bolted to grade ring and secured with grout and cement mortar fillet. After the frames are securely set, the frames and the covers shall be cleaned and scraped free of foreign materials, and shall be ground or otherwise finished as needed so the cover fits in its frame without rocking.

5. Watertightness: It is the intent of these specifications that manholes and appurtenances be watertight and free from infiltration. All manholes are to be banded both inside and outside with cement-mortar grout. Where called for in the plans or supplemental specifications, manholes that are to be given a protective lining or coating shall be free of any seeping or surface moisture. The adequacy of manholes and appurtenances as to watertightness shall be determined by the District representative and shall be tested in accordance with Section 15043, Leakage and Infiltration Testing.

6. Stubs: Sewer pipe shall be furnished and installed in manholes at the locations shown and in conformance with the detail drawings and plans. All stubs shall be plugged with stoppers as shown on the plans for various sizes of pipe.

7. Sealing Before Completion: In order to prevent accidental use of the new sewer before completion and acceptance, the inlet to existing tie-in manholes shall be sealed with broken brick and mortar. Installation of these plugs shall be approved by the District representative. Plugs shall be removed at the time of final inspection or as directed by District representative.

8. Bulkheads: Brick and mortar bulkheads shall be installed at the downstream end of all unused stub channels over 5 feet long to prevent the creation of a septic condition resulting from ponding of sewage and debris in the unused channels, and until such time as the manhole stub is connected and normal sewage flow can occur. A plug shall be required for all downstream stubs.

9. New Connections to Existing Manholes: New connections to existing manholes wherein stubs have not been provided shall be made by core drilling through the base, as directed by the District Engineer.

10. Backfill: Backfill around the precast concrete manhole shall be imported sand, and shall be placed and compacted in accordance with Section 02223, Trenching, Backfilling, and Compacting.

11. Grade Rings: Class B concrete rings shall be cast around manhole frames that are flush with the surface. The ring shall be placed after final grading or paving together with final cleanup.

12. Pavement Replacement: Replacement of bituminous or concrete pavement shall be in accordance with the requirements of the governmental agency having jurisdiction.

E. Manhole and Manhole Base Repairs

Manhole sections and bases that exhibit defects in the concrete surface may be rejected. Defective concrete surfaces of manhole sections and bases not rejected shall be repaired by chipping away unsound or imperfect concrete. Edges shall be left sharp and square with the surface. Loose material and dust remaining after chipping shall be removed by means of an air jet. Epoxy grout shall be applied to the surface to be repaired in accordance with the manufacturer's instructions. The grout shall wet the contact surface and provide proper adhesion, or a coat of epoxy shall be applied prior to placing the epoxy grout.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 03462**

# PRECAST CONCRETE VAULTS

## PART 1 - GENERAL

A. Description

This section includes the materials, manufacture, and installation of precast concrete vaults, vault frames and covers.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Structure Earthwork: 02200

2. Concrete: 03300

C. Approved Manufacturers

1. Precast Vaults
   - Utility Vault
   - J & R Products
   - Jensen Precast

2. Meter Boxes
   - Christy
   - Armorcast
   - BES

3. Joint Sealing Compound
   - Conseal

4. Waterproofing
   - Grace Dehydratine 4

5. Frames and Covers
   - Bilco

D. Frames and Covers

All precast sections shall be provided with fabricated aluminum or steel frames and covers as specified or shown on the drawings and shall be built up so that the cover is flush with the surrounding surface unless otherwise specified on the drawings or by the District representative in the field.

E. Meter Boxes

1. Precast concrete meter boxes for copper setters, 2-inch and smaller shall be purchased and installed by the contractor unless noted otherwise. Meter box lid shall be polymer type.

2. Sizes shall be as specified on the standard drawings for the various sizes and types of services.

F. Purchase of Vaults

The contractor shall purchase precast concrete vaults for meter installations 3-inch and larger and other applications.

## PART 2 - MATERIALS

A. Precast Concrete Vault

1. Precast concrete vaults and covers shall be manufactured in a plant especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

2. Design loads shall consist of dead load, live load, impact, and in addition, loads due to water table and any other loads which may be imposed upon the structure. Live loads shall be for H-20 per AASHTO standard specifications for highway bridges. Design wheel load shall be 16 kips. The live load shall be that which produces the maximum shears and bending moments in the structure.

3. Concrete shall be Class A conforming to Section 03300.

4. Vault floor shall be treated such that a non-skid surface is provided.

5. Vault floor shall contain grooved channels to convey drainage to a sump area.

B. Meter Box Covers

1. All meter box covers shall be furnished with rectangular reading lids.

2. Concrete meter box covers shall be installed in all locations.

C. Vault Frames and Covers

1. Vault frames and covers shall be fabricated aluminum with stainless steel hardware.

2. Covers shall be fabricated with supports to resist deflection.

3. All covers shall be hinged providing access to the entire vault. Covers shall have spring hydraulic assists.

4. All covers shall be equipped with a hold-open mechanism with safety chains.

5. All covers shall be equipped with a flush, locking device with locking eyes up.

6. All frames and covers shall be equipped with a "ladder up" to provide access assistance.

7. All covers must be H20 traffic rated for equipment or vehicle loading, unless specified otherwise by the District Engineer.

D. Joint Sealing Compound

The joint sealing compound shall be a permanently flexible plastic material complying in every detail to Federal Specification SS S-00210 (GSA-FSS) dated July 26, 1965. "Quickseal", or approved equal.

E. Waterproofing

Waterproofing shall be formulated to comply with Federal Specification SS-A-701.

**PART 3 - EXECUTION**

A. Earthwork

1. Excavation and backfill for precast concrete vaults shall be in accordance with Section 02200 and the requirements herein.

2. The contractor shall prepare an excavation large enough to accommodate the structure and permit grouting of openings and backfilling operations.

3. The bottom of the structure shall be placed on 6- inches of compacted, crushed rock sub-base, graded level and to the proper elevation as shown on the plans, unless otherwise indicated by the District Engineer.

B. Installation

1. Openings or "knockouts" in precast concrete vaults shall be located as shown on the drawings and shall be sized sufficiently to permit passage of the largest dimension of pipe and/or coupling flange. Upon completion of installation, all voids or openings in the vault walls around pipes shall be filled with 3,000-psi concrete or mortar, using an approved epoxy for bonding concrete surfaces.

2. After the structure and all appurtenances are in place and approved, backfill shall be placed such that finished grade is sloped away from vault (in unpaved areas) or such that vault is flush with finished grade (in paved areas) to the original ground line or to the limits designated on the plans, unless otherwise indicated by the District Engineer.

3. All joints between precast concrete vault sections shall be made watertight using preformed mastic material. The sealing compound shall be installed according to the manufacturer's recommendations to provide a watertight joint which remains impermeable throughout the design life of the structure. All joints shall be filled with dry-pack non-shrink grout.

4. Frames and covers shall be built up so that the cover is flush with the surrounding surface unless otherwise specified on the drawings or by the District representative in the field. The contractor is responsible for placing the cover at the proper elevation where paving is to be installed and shall make all necessary adjustments so that the cover meets these requirements.

Waterproofing shall be applied to the exterior walls of all buried vaults in accordance with the manufacturer's instructions. Protection shall be placed over the waterproofing to prevent damage.

C. Meter Boxes

1. Boxes shall be set true to line and to the grade of the top of the curb, sidewalk, or surrounding graded area.

2. Meter boxes are not to be set until fine grading for landscape grading has been completed by the developer.

3. Retaining walls may be required around meter boxes installed on slopes as determined by the District representative.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 03463**

# GREASE INTERCEPTORS

## PART 1 - GENERAL

A. Description

This section includes materials and installation of precast concrete grease interceptors on commercial sanitary sewer conditions.

B. Related Work Specified Elsewhere

| | | |
|---|---|---|
| 1. | Installation of Gravity Sewer Pipelines | 02701 |
| 2. | Precast Concrete Vaults | 03462 |

C. Approved Manufacturers

GT series as manufactured by Jay R. Smith Manufacturing Company
Pro-Cast
Jensen Precast
Pyramid Precast

D. Application

Grease interceptors are to be installed on the sewer laterals from all restaurants and other commercial sewer connections as designated by the District in the Procedures Guidelines and Design Requirements manual.

E. Responsibility

It is the responsibility of the owner of each facility to maintain the grease interceptor in proper operating order and to remove accumulated grease at suitable intervals to avoid excessive build-up in the unit.

## PART 2 – MATERIALS

A. Precast Vault

1. Precast vault shall meet the requirements of Section 03462.

2. The interior of the precast unit shall be sealed with a protective coating.

3. The interceptor shall have an interior baffle for full separation of the interceptor into two (2) sections. The interior baffle shall have two (2) openings of the same diameter and at the same invert height as the outlet pipe. The baffle openings shall be staggered from the inlet and outlet pipes to prevent straight line flow through the unit.

4. The outlet pipe shall be the same diameter as the inlet pipe.

5. The interceptor shall have an adequate number of manholes to provide access for cleaning all areas of the interceptor. A minimum of one manhole per ten (10) feet of interceptor length shall be provided. Manholes shall be gas-tight in construction with a minimum opening dimension of twenty (20) inches.

6. Each grease interceptor shall be permanently and legibly marked with the Manufacturer's name or trademark, model number and UPC certification mark.

## PART 3 – EXECUTION

A. Location

1. The grease interceptor shall be located on private commercial sewer laterals upstream of the connection to the MCWD sewer main.

2. The interceptor shall be located where it is easily accessible for inspection, cleaning and removal of intercepted grease.

B. Installation

1. Grease interceptors shall be installed per Section 03462.

2. Sewer laterals connections to the grease interceptor shall be per Section 02701.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 09900**

# PAINTING AND COATING

## PART 1 - GENERAL

A. Description

This section includes the materials and application of painting and coating systems for buried and exposed surfaces.

All articles to be painted or coated will be painted or coated in the place of manufacture, unless field painting and coating is absolutely necessary. The District representative will make the determination. In the event that the paint or coating is damaged in the field, it will be touched up in the same manner as the original paint or coating applied in the place of manufacture.

B. Related Work Described Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Ductile-Iron Pipe and Fittings: | 15056 |
| 2. | Manual Valves: | 15100 |
| 3. | Fire Hydrants: | 15139 |
| 4. | Domestic and Recycled Water Facilities Identification: | 15151 |

C. Submittals

Submit a Paint Plan for all proposed surfaces. The plan shall identify all materials and procedures, including proposed paint systems, names and experience of personnel to perform the work, proposed surface preparation specifications, required physical and environmental conditions to perform the work and proposed test methods and reporting for both factory and field applications. The plan shall also include proposed maintenance requirements for all surfaces. Samples of field applied paint and coating finishes, colors, and covering shall also be provided. The paint plan and all samples shall be provided at least 60 days prior to start of such finishing operations.

D. Approved Manufacturers

All materials shall be as manufactured by the companies listed herein or approved equal.

Tnemec (866-317-3206), Carboline, Dunn-Edwards, International Protective Coatings, Rust-Oleum Corporation, 3M Minnesota Mining and Manufacturer

E. Coatings

All specified materials must meet and comply with National Sanitation Foundation (NSF) and California current air quality regulations governing architectural and industrial coatings.

1. Organic Zinc Primer
   Tnemec 90-97
   Carboline 621
   Rust-Oleum 7400 System Zinc Chromate PrimerDevoe CC 302V
   International Protective Coatings – Interzinc 52

2. Epoxy Coating

   a. Field Applied

      Tnemec Series N69 or 164 Epoxoline
      Carboline 187
      Rust-Olem 9100 High Performance Epoxy Devoe BR235H
      International Protective Coatings – Interguard 475HS

   b. Field or Factory Applied

      Tnemec Series 140 NSF 61
      International Protective Coatings – Interline 850 or 925
      Devoe BR235H

   c. Factory Applied

      3M Scotchkote 206N Fusion Bonded Epoxy

3. Polyurethane
   Tnemec Series 107575 & 175
   Carboline 134 HS VOC
   Devoe 379H

4. Bituminous Mastic Epoxy
   Carboline 300M
   Tnemec Series 46H413
   Rust-OleumDevoe Devtar SA

5. Acrylic Primer
   International Intercryl 520
   Tnemec Series 26 TyCRYL
   Rust-Oleum Devoe Devflex 4020

F. Paint Schedule

It is desired that aboveground or exposed facilities shall be color-coded depending if they are domestic water, recycled water facilities, or wastewater facilities.

1. Domestic Water System

a. Piping and Equipment: Safety Blue

Tnemec Series 1075-11SF79 SC06

b. Public Fire Hydrants: Safety Yellow

Tnemec Series 29-02SF20 SC01
Rust-Oleum No. 5244402

c. Private Fire System: Safety Red

Tnemec Series 29-06SF20 SC09
Dunn-Edwards No. 10-19

d. Steel Reservoir Exterior: Sahara Desert Sands EN04 (Sahara not offered by Tnemec)

Tnemec Series 1075-23BR

2. Sewer System

Lift Station Piping and Equipment: Safety Tan or Brown

Tnemec 7-S0356 Tneme-Cryl SB
Tnemec 7-S0355 Tneme-Cryl SB
Dunn-Edwards Syn-Lustro 10-5 (Safety Tan)
Dunn-Edwards Syn-Lustro 10-25 (Brown)

3. Recycled Water Facilities: Safety Purple

Tnemec Series N69-14SF
Dunn-Edwards Syn-Lustro 10-13

G. Permits

All work shall conform to the specifications and requirements of the State of California Department of Transportation, the County, the city having jurisdiction, or and other agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

**PART 2 – MATERIALS**

A. Zinc Primer

1. All primer shall contain not less than 79.60% zinc in dry film.

B. Bituminous Mastic

1. Bituminous mastic shall be coal-tar pitch based.

2. Bituminous mastic shall have a minimum of 68% solids by volume.

D. Epoxy Coating

1. Epoxy shall meet current local air quality standards and shall not be less than 65%.

2. All coatings and pigments to be used on domestic water services shall have NSF approval for use with domestic water.

**PART 3 – EXECUTION**

A. Surface Preparation

1. Do not sandblast or prepare more surface area than can be coated in one day. Remove all sharp edges, burrs, and weld spatter. Do not sandblast epoxy-coated pipe that has already been factory coated.

2. Surface preparation shall conform with the SSPC specifications as described below:

| | |
|---|---|
| Solvent Cleaning | SP-1 |
| Hand Tool Cleaning | SP-2 |
| Power Tool Cleaning | SP-3 |
| White Metal Blast Cleaning | SP-5 |
| Commercial Blast Cleaning | SP-6 |
| Brush-Off Blast Cleaning | SP-7 |
| Pickling | SP-8 |
| Near-White Blast Cleaning | SP-10 |

3. Wherever the words “solvent cleaning,” “hand tool cleaning,” “wire brushing,” or “blast cleaning” or similar words are used in these specifications or in paint manufacturer’s specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council, Surface Preparation Specifications, ANSI A159.1) specifications listed above.

B. Painting Systems

1. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

2. Deliver all paints to the job site in the original, unopened containers.

C. Surfaces Not To Be Coated

The following surfaces shall not be painted and shall be protected during the painting of adjacent areas:

- Mortar-coated pipe and fittings
- Stainless steel
- Metal letters
- Nameplates
- Grease fittings
- Brass and copper, submerged
- Buried pipe, unless specifically required in the piping specifications
- Bronze meters and strainers

D. Protection of Surfaces Not To Be Painted

Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

E. Field Touch Up of Manufacturer-Applied Prime Coats

Surfaces that are primed at the place of manufacture shall receive a field touch-up of organic zinc primer to cover all scratches or abraded areas.

F. Bituminous Mastic

1. Buried metal (flanges, non-stainless steel nuts and bolts, flexible couplings, exposed reinforcing steel, etc.) shall be coated with a minimum of 20 mils of bituminous mastic.

2. All surfaces coated with bituminous mastic shall be covered with 8 mil polyethylene wrap per Section 15056, after applying the bitumastic.

G. Epoxy Coating

1. Only those metal surfaces specifically called out shall be epoxy coated.

2. Epoxy lining and coating of valves shall be per AWWA C550 and Section 15100 Manual Valves. All valves shall be lined and coated by manufacturer.

3. Surfaces to be epoxy coated shall follow the surface preparation requirements as recommended by the manufacturer.

4. Surfaces shall be coated with organic zinc primer to a dry film thickness of 3 mils.

5. Apply two coats of epoxy paint (4 mils each) to the primed surface. The manufacturer's recommended drying time between coats shall be followed.

6. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

H. Dry-Film Thickness Testing

1. Measure coating thickness specified for metal surfaces with a majestic-type dry-film thickness gage. Test the finish coat (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Measuring equipment shall be provided by the contractor. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog. Provide dry-film thickness gage as manufactured by Mikrotest or Elcometer. Check each coat for the correct dry-film thickness. Do not measure within eight hours after application of the coating.

2. If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and topcoated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

I. Warranty Inspection

Warranty inspections shall be conducted during the eleventh ($11^{th}$) month following completion of all coating work. Personnel present during the pre-construction meeting shall be present at this inspection. All defective work shall be repaired per the approved work plan as submitted by the contractor.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 13110**

# CORROSION PROTECTION AND JOINT BONDING

## PART 1 - GENERAL

A. Description

This section describes the materials, installation and testing requirements for corrosion protection and monitoring facilities for buried piping and appurtenances. The facilities addressed below include: corrosion test stations; reference cells; insulating flange kits, casing insulators and seals; bonding for pipe and mechanical joints; alumino-thermic welds and sacrificial anodes for new water services and air/vacuum assemblies. Pipeline cathodic protection requirements are not included unless otherwise specified on plans.

Corrosion protection shall be provided according to corrosion study recommendations as specified in the Procedures Guidelines and Design Requirements manual.

B. Related Documents

District Standard Plans: CP-1 through CP-14

1. Trenching, Backfilling, and Compacting: 02223
2. Concrete: 03300
3. Painting and Coating: 09900

C. Specifications and Standards

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 designations only.

| | |
|---|---|
| ANSI/ASME B16.21 (Rev 1992) | Nonmetallic Flat Gaskets for Pipe Flanges |
| ASTM B3-90 | Soft of Annealed Copper Wire |
| ASTM B8-86 | Concentric-Lay-Stranded Copper Conductors |
| ASTM B 418 | Standard Specification for Cast and Wrought Galvanic Zinc Anodes |
| ASTM D 1248-84 (Rev 89) | Polyethylene Plastics Molding and Extrusion Materials |

| | |
|---|---|
| AWWA C-217 | Wax Coating Systems for Underground Piping Systems |
| MIL-C-18480B | Coating Compound, Bituminous, Solvent, Coal Tar Base |
| NACE RP0169-96 | Recommended Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems |
| NACE RP0286-97 | Electrical Isolation of Cathodically Protected Pipelines |
| NEMA LI 1 –1989 (Rev 1995) | Industrial Laminated Thermosetting Products |
| UL 83-80 | Thermoplastic-Insulated Wires |

D. Submittals

1. Manufacturer's catalog cuts including:

   a. Post-mounted test enclosure
   b. Enclosure components
   c. Redwood post
   d. Conduit
   e. At-grade test boxes
   f. Brass tags
   g. Insulating flange kits
   h. Wax tape wrap system
   i. Wire and cable
   j. Plastic warning tape
   k. Casing seals
   l. Casing insulators
   m. Zinc water service anodes

2. As-built Drawings: The contractor shall maintain as-built drawings showing the exact locations of all corrosion monitoring test stations, insulators, and wire trenching runs. Location changes from the design drawings shall be legibly indicated in red on a blue line copy of the design drawings. These drawings shall be submitted to the District's representative before the work is considered complete.

3. Test Results: The following test results shall be submitted to the District representative.

   a. Continuity test report
   b. Insulator test results
   c. Initial pipe-to-soil potential survey

4. Notification for Testing: The contractor shall notify the District representative at least five days in advance of installation of anodes and completion of wrapping of buried flanges and couplings. The contractor shall also notify the District representative when test leads, continuity bonding and test boxes are installed and ready for inspection.

## PART 2 - MATERIALS

A. Test Stations

1. Post Mounted Test Boxes:

a. Enclosure: The enclosure for a post mounted shunt box shall be approximately 7.5 inches x 6 inches x 5.28 inches and suitable for mounting on a post. Enclosure shall be constructed of one piece molded fiberglass and conform to NEMA 3R. The enclosure shall be constructed of fiberglass-reinforced resins that are chemically resistant to a wide range of corrosive atmospheres. The enclosure shall have non-metallic hinges and lockable quick release latches. Enclosure shall be Hoffman, Catalogue No. A-865JFGQRR or approved equal.

b. Panel: The mounting panel shall be fiberglass, micarta, or laminated phenolic sheet cross-laminated for resistance to warpage and weathering. Minimum panel thickness shall be 3/16-inch. Panel shall be mounted off of the back of the enclosure to allow sufficient space for terminal connectors.

c. Components: All terminal lugs and fasteners shall be solid brass. Provide a properly sized terminal lug for all wires. See District Standard Drawings for wiring configuration and wire labels

d. Post: Post shall be seasoned, construction heart garden grade redwood, 4 inches by 4 inches, and surfaced on four sides. Cut a ¾-inch chamfer in all 4 top edges. Posts shall be 66-inches in length.

e. Conduit: Conduit for the post mounted test boxes shall be 2-inch diameter galvanized steel approximately 4-feet long.

f. Panel Labels. All wire terminations on test station panel shall be identified by permanent marking. A self-adhesive aluminum tape permanently embossed with the required identification shall be fixed to the terminal board. Identify leads using an identification device by Dymo Products Company of Augusta, Georgia or approved equal.

2. At-Grade Test Box:

a. Test Box: At-grade test boxes shall be round, pre-cast concrete with dimensions of 13-1/2-inch O.D. by 8-inch I.D. by 12-inches high, similar to Christy G5 Utility Box with a cast iron supporting ring and lid, and shall have sufficient strength to support occasional vehicular traffic. The lid shall be 11 inches O.D. and cast with the legend "CP Test" using letters not less than 1-1/2-inches high.

b. Concrete Pad: Test boxes mounted in unpaved areas shall be mounted in a reinforced 26-inch square by 4-inches thick concrete pad (Class B concrete per Section 03300). Rebar shall be No. 4. A concrete pad is not required where the test box is placed in pavement.

c. Brass Identification Tags: Wire identification tags shall be 1-1/2-inch diameter brass discs with a 3/16-inch diameter hole and die stamped with 1/4-inch characters. Tags shall be attached to test wires with un-insulated AWG No. 14 solid copper wire.

B. Insulating Flange Kits

Insulating flange kits shall contain full-face gaskets, full-length sleeves and double washers (steel and phenolic) on each end. Flange insulation kits shall consist of:

1. Insulating Gaskets: Gaskets for flanges 16-inches or greater shall be Type E fullfaced Phenolic with Rectangular Nitrile or Viton O-Ring Seal (PSI Linebacker or equal). For flanges less than 16-inches, gaskets shall be Type E fullfaced neoprene faced phenolic.

2. Insulating Stud Sleeves for Bolts: Insulating sleeves shall be 1/32-inch thick, G10 laminated glass tube. For installation on threaded studs use full-length sleeves. For installation on threaded bolts, i.e., at butterfly valve flange bonnets and bases, the sleeves shall be half-length.

3. Insulating Washers for Bolts: Insulating washers shall be 1/8-inch G10 laminated glass.

4. Steel Washers Over Insulating Washer: 1/8-inch thick cadmium plated steel to be placed between the nut and the insulating washer.

C. Wax Tape External Coating

1. Wax Tape Coating: All buried non-mortar coated fittings and appurtenances such as valves, flanges, insulating flanges, couplings, etc. shall be coated with a wax tape primer and wrap per AWWA C217 and the District Standard Drawings.

2. Primer: All exposed non-mortar coated surfaces including flanges, bolts and nuts shall be prime coated with a blend of petrolatum, plasticizer, inert fillers, and corrosion inhibitor having a paste-like consistency.

3. Wax Tape: Wrap primed surfaces with a synthetic felt tape saturated with a blend of petrolatum, plasticizers, and corrosion inhibitors that is easily formable over irregular surfaces. A compatible petrolatum filler should be used to smooth over irregular surfaces.

4. Outer Covering: The primed and wax-tape wrapped flange shall be wrapped with a plastic tape covering consisting of three (3) layers of 1.5 mil, polyvinylidene chloride or PVC, high cling membranes wound together as a single sheet.

5. Protective Overwrap: The edges of flanges 18-inches in diameter and larger shall be wrapped with 10-mil pipe tape (two layers, 50% overlap) to protect wax tape during backfilling process.

D. Wire and Cable

1. General: All DC wires shall be stranded copper with high molecular weight polyethylene (HMWPE) or thermal plastic (THWN) insulation suitable for direct burial in corrosive soil and water, conforming to UL 83 and ASTM Standards B3 or B8. HMWPE insulation and shall conform to the requirements of ASTM D1248 Type 1, Class C. THWN insulation shall conform to the requirements of ASTM D-2220

2. Test Leads: Test wires shall be sized as shown in the District Standard Drawings. Each test lead shall be of sufficient length to extend from the attachment to the pipe or casing to the test box without a splice. Wires with cut or damaged insulation will not be accepted and replacement of the entire lead will be required at the contractor's expense.

3. Bond Wires: Bond wires shall be AWG No. 2, No. 4, or No. 6 HMWPE depending on the pipe diameter and as described in the District Standard Drawing W-31. Bond wires shall have minimal slack wire at each weld but otherwise be as short as possible.

E. Alumino-Thermic Welds

1. Weld Process: Cable-to-metal connections shall be made by the alumino-thermic welding process. Weld charge size, alloy and mold size shall be as specified by the manufacturer of the weld kit for use on steel or ductile iron pipe.

2. Weld Cap Primer: Weld cap primer shall be an elastomer-resin based corrosion resistant primer for underground services such as Royston Roybond Primer 747 or approved equal.

3. Weld Caps: Alumino-thermic welds shall be sealed with a pre-fabricated plastic cap filled with formable mastic compound on a base of elastomeric tape. Weld caps shall be Royston Handy Cap 2 or approved equal.

4. Weld Coating: All buried alumino-thermic welds and weld caps shall be coated with a cold-applied fast-drying mastic consisting of bituminous resin and solvents per Mil. Spec MIL-C-18480B such as Carboline 300M, Tnemec 40-H-413, Tape-coat TC Mastic or 3M Scotch Clad 244. The minimum coating thickness shall be 25 mils (0.025 inch).

F. Plastic Warning Tape

The plastic warning tape shall be 3 inches wide and shall have a printed warning - "Caution - Cathodic Protection Cable Buried Below" or similar.

G. Mortar

Mortar used to repair concrete coated pipe after attachment of bond or pipe test lead wires shall be the fast drying, non-shrinkable type.

H. Casing Seals

Casing seals used to prevent moisture intrusion into the casing annular space shall be either a rubber link or pull-on sleeve type.

1. "Rubber link" casing seals are made of molded, solid, synthetic rubber and are connected together by corrosion resistant bolts and nuts. After the links are placed in the casing opening, the bolts are turned to create an airtight and watertight seal. These types of casing seals shall be "Link Seals" brand, or approved equal.

2. "Sleeve" casing seals are made of 1/8-inch thick, synthetic rubber. The sleeve is fastened to the exterior of the casing and carrier pipe using stainless steel strapping. These types of casing seals shall be PSI Model "C" - Custom Pull-On seals, or approved equal.

I. Casing Insulators

Casing insulators used to prevent contact between the casing and carrier pipe shall be comprised of a fusion coated, 8-inch wide steel band with 2-inch wide glass reinforced plastic runners. These types of casing insulators shall be PSI Spacer Model C8G-2, or approved equal.

J. Zinc Anodes for New Services and Air-Vacs

1. Zinc Anode: Anode shall conform to ASTM B 418, Type II and shall be a prepackaged zinc alloy ingot having a chemical composition not exceeding the following limits:

| | |
|---|---|
| Aluminum | 0.005% Max. |
| Cadmium | 0.0000% Max. |
| Iron | 0.0014% Max. |
| Zinc | Remainder |

2. Anode Weight and Dimensions: Ingot weight shall be 12 pounds. Ingot dimensions shall be 1.4-inches x 1.4 inches x 24 inches.

3. Anode Backfill: Each zinc anode shall be prepackaged in a permeable cloth bag with a backfill of the following composition or installed bare and backfilled with material having the following composition.

| | |
|---|---|
| Gypsum | 75% |
| Powdered Bentonite | 20% |
| Anhydrous Sodium Sulfate | 5% |

Backfill grains shall be capable of 100% passing through a 100 mesh screen. The backfill shall be firmly packed around the anode by mechanical vibration to density which will maintain the zinc ingot in the center of the cloth bag and surrounded by at least 1-inch of backfill.

4. Steel Core: Anode shall be cast full length with an electrogalvanized 1/4-inch diameter steel core which shall be exposed at one end for connection of the anode lead wire.

5. Anode Lead Wire: Anode lead wire shall be AWG No. 12 stranded copper wire with THWN insulation suitable for direct burial use. Wire shall be attached to the steel core with silver solder by the manufacturer. The connection shall be encapsulated in a heat-shrinkable sleeve. Anode lead wire shall be of sufficient length of extend from the anode to the designated termination point without a splice. Wires with cut or damaged insulation will not be accepted and replacement of the entire lead will be required at the contractor's expense.

## PART 3 - EXECUTION

A. General

Corrosion protection and monitoring installation shall conform to NACE Publication RP-0169 (Latest Revision) - Recommended Practice, Control of External Corrosion on Underground and Submerged Metallic Piping Systems.

B. Post Mounted Test Boxes:

1. Location: Locate redwood post directly above the pipeline, if possible, but not in a roadway or in a location that is particularly susceptible to damage. The District representative shall approve test station locations.

2. Test Box and Conduit: Connect 2-inch galvanized conduit to the anode test box with a threaded screw connection. Attach conduit to the post with two galvanized pipe straps and threaded fasteners. Insert all test leads in the galvanized conduit and run into test box prior to setting the post in concrete.

3. Post: Post shall be 5-feet in length with a chamfered top. Excavate a 16-inch diameter by 20-inch deep hole. Center the post and test box in the hole and fill the hole with concrete. The concrete shall be Class B per Section 03300.

4. Wire Identification: The self-adherent identification tape shall be attached to the micarta panel at the termination point of each wire. The tape shall identify the owner-size-service of the pipe to which the test leads are attached. For example: MCWD 18" RW. For wires attached to insulating flanges, an additional "N", "S", "E", or "W" for North, South, East or West shall be included on the identification tape to indicate on which side of the insulating flange the wires are attached.

C. At-Grade Test Boxes

1. Location: The at-grade test boxes shall be installed adjacent to paved roadways behind the curb; in the sidewalk, beyond the edge of the sidewalk, or in a planter as shown in the District Standard Plan CP-8. If no curb exists, locate the test box just off the paved surface. In unpaved areas or parking lots, locate the test box directly over pipe (but not in parking spaces). The District representative shall approve all test box locations.

2. Installation: All wire shall be properly identified, with approximately 18 inches of slack wire above finish grade and coiled inside the test box. Keep the inside of the test box clear of all debris and other foreign material. Top of box shall be flush with finish grade.

3. Wire Identification: Brass identification tags shall be securely attached to each of the wires in the test box with un-insulated AWG No. 14 solid copper wire. Tags shall be stamped with the owner-size-service of the pipe to which the test leads are attached. For example: MCWD 18" RW. Brass tags on wires in insulating flange test boxes shall be stamped with the additional identification of "N", "S", "E", or "W" for North, South, East or West to indicate on which side of the insulating flange the wires are attached.

D. Test and Bond Wire

1. Test Wires: Test wires shall be attached to the pipe and terminate in a test box without a splice as shown in the District Standard Drawings. A minimum of 18 inches of slack wire shall be coiled at each pipe connection and in each test box for each wire.

2. Bond Wires: Two or three bond wires shall be installed on steel pipe across each buried, unwelded pipe joint or mechanical joint including valves, couplings, special fittings and flanges except insulating flanges, as shown on District Standard Plan CP-10. Bond wires shall not be attached to valve bodies, but instead to the flange of the valve.

3. Connection to Pipe: Connections of copper wire to the pipeline shall be made with alumino-thermic weld charges or by brazing. Welding charges shall be the product of a manufacturer regularly engaged in the manufacture of the material. Manufacturer's recommend cartridge size and type shall be used. Only one wire shall be connected with each weld. Welds shall be no closer than 3-inches. Each completed weld shall be coated as described below.

   a. Preparation of Wire: Use a cutter to prevent deforming wire ends. Remove only enough insulation from the wire to allow the weld connection to be made. Do not use a hacksaw for cutting.

   b. Preparation of Metal: Remove all coating, dirt, grime and grease from the metal pipe at weld location by wire brushing and/or use of suitable safe solvents. Clean the pipe to a bright, shiny surface free of all serious pits and flaws by use of mechanical grinder or a file. The area of the pipe where the attachment is to be made must be absolutely dry. Failure to provide a dry surface for welding will result in a poor quality weld and could result in serious injury to the workman.

   c. Attachment of Wire to Pipe: The attachment of copper wire shall be made using an alumino-thermic weld as shown on the District Standard Plans. The wire is to be held at 30° to 45° angles to the surface when welding. One wire only shall be attached with each weld.

   d. Testing of All Completed Welds: As soon as the weld has cooled, the weldment shall be tested for strength by striking a sharp blow with a two-pound hammer while pulling firmly on the wire. All unsound welds are to be re-welded and re-tested. All weld slag shall be removed from the weldment.

   e. Coating of All Completed Welds: Thoroughly clean by wire brushing the area to be coated. The area must be completely dry. Apply the weld cap primer and the weld cap. Overcoat the weld cap with a bituminous mastic coating material in accordance with the manufacturer's recommendations. Completely coat the weld, all bare pipe surfaces around the weld and any exposed copper wire. For non-mortar coated pipe, extend coating 3 inches beyond weld cap. For mortar-coated pipe, apply coating up to but not over mortar. Allow sufficient time to dry prior to repair of the mortar coating on steel pipe.

f. Mortar Repair: On mortar-coated pipe, the mortar coating shall be repaired after the bituminous weld coating has dried, using fast-setting, non-shrinkable mortar to restore the original outside diameter of the pipe at each weld location.

4. Wire Trenching and Backfill

a. Depth: All buried wiring shall be installed at a minimum depth of 24 inches.

b. Backfill: The bottom 2 inches of the finished trench shall be sand or stone-free earth. The first 3 inches of the backfill shall be sand or stone-free earth placed directly on the wires. The remainder of the trench shall be backfilled with native earth with a maximum stone size of 2 inches and compacted as specified in Section 02223. Care shall be taken when installing wire and backfilling trench so that insulation is not broken, cut, nicked, or bruised. If wire insulation is damaged during installation, it shall be replaced completely at the contractor's expense.

c. Plastic Warning Tape: Plastic warning tape shall be run in the wire trench at a depth of 12-inches and above each buried wire

E. Flange Insulation Kits

1. General: A four-wire test station shall be installed at each buried insulating flange. Two test wires shall be installed on each side of the buried insulator according to this specification and the District Standard Plans CP-13 and CP-14.

2. Flange Kits: Insulating kits shall be installed as shown on the District Standard Plans CP-13, CP-14, and as recommended by the manufacturer. Moisture, soil, or other foreign matter must be carefully prevented from contacting any portion of the mating surfaces prior to installing insulator gasket. If moisture, soil or other foreign matter contacts any portion of these surfaces, the entire joint shall be disassembled, cleaned with a suitable solvent and dried prior to reassembly.

3. Handling of Gasket: Care shall be taken to prevent any excessive bending or flexing of the gasket.

4. Alignment: Alignment pins shall be used to properly align the flange and gasket.

5. Bolt Tightening: The manufacturer's recommended bolt-tightening sequence shall be followed. Bolt insulating sleeves shall be centered within the insulation washers so that the insulating sleeve is not compressed and damaged.

6. Paint Pigments: Neither aluminum, graphite, nor any other electronically conductive pigment shall be used in paints or coatings on the flanges, bolts, or washers of any insulating device.

7. Testing: All insulating flanges must be inspected, tested and approved by the Corrosion Engineer retained by the District as described in this specification section. All buried insulating flanges must be tested prior to wax tape wrap coating and backfilling.

F. Wax Tape Coating:

1. Primer: Surface shall be cleaned of all dirt, dust, and loose rust or mill scale by wire brush and by wiping with a clean cloth. The surface shall be dry. Apply primer by hand or brush. A thick coating of primer shall be worked into all crevices, around bolts and in threads, and shall completely cover all exposed metal surface. The primer should overlap the pipe coating by 3-inches minimum.

2. Wax-Tape: The petroleum wax-type can be applied immediately after primer application. Short lengths of tape shall be cut and formed completely around each individual bolt and stud-end. After all bolts are covered, the tape shall be applied circumferentially and formed by hand into all voids and spaces. There shall be no gaps or air spaces under the tape. The tape shall be applied with at least 55% overlap.

3. Outer Covering: The clear plastic outer covering shall be applied by hand such that the material conforms and adheres to the wax-tape surface. Three layers of plastic outer wrapping shall be applied.

4. Protective Overwrap: The edges of all flanges 18-inches in diameter and larger shall be wrapped with 10-mil pipe tape (two layers, 50% overlap) to protect wax tape during backfilling process

G. Casing Seals

The casing end seal ("rubber link" or "sleeve" type) shall be installed wherever a metallic pipeline passes through a steel casing in order to restrict water intrusion into the casing annular space. The casing seal shall be installed according to the manufacturer's recommendations.

H. Casing Isolation

The encased sections of metallic piping shall be electrically isolated from the casing. Use casing insulators to prevent metallic contact and ensure a minimum amount of standoff between casing and carrier pipe. Distance between spacers shall be small enough to prevent excessive sagging of the line.

I. Zinc Anodes

1. General: Where called for on the drawings, prepackaged zinc anodes shall be installed in excavated, drilled, or punched holes a minimum of 8-inches in diameter. Anodes shall be installed below the level of the service or air/vac line, with a minimum separation of 2 feet between the copper water tubing and the zinc anode maintained at all times. Anodes shall not be lowered, transported, handled, or lifted by the lead wire.

2. Location: Anode shall be installed approximately midway between pipeline and meter box.

3. Backfilling: After the prepackaged anode is placed in the hole, approximately 5 gallons of water shall be poured into the hole so that the anode is completely covered with water. Allow water to soak for 30 minutes. Stone-free native soil shall then be used to backfill the anode hole. Imported sand shall not be used for backfilling. The anode hole shall be

backfilled in stages and carefully compacted to ensure that no voids exist around the bag and that the bag and anode wire are not damaged. After backfill is level with the top of the anode, another 5 gallons of water shall be poured into the hole to completely saturate the soil backfill. More water shall be added if it is suspected that the backfill is not completely saturated. Care shall be taken to avoid damage to the anode and anode lead wires.

4. Anode Lead Wire: The anode lead wire shall extend from the anode along the copper pipe to the water service or air/vac meter box. The anode lead wire shall be attached to the copper water service or air/vac riser inside the meter box using a bronze mechanical grounding clamp.

## PART 4 - REQUIRED TESTING AND RECORD KEEPING

A. Test Lead And Bond Wire Welds

1. Responsibility: The contractor shall be responsible for inspection all wire insulation for damage and for testing all test lead and bond wire welds.

2. Test Method: All wire insulation shall be visually inspected. All completed wire connection welds shall be tested for strength by striking the weld with a sharp blow with a 2-pound hammer while pulling firmly on the wire. Welds failing this test shall be re-welded and re-tested. Wire welds shall be spot tested by the District representative. After backfilling pipe, all test lead pairs shall be tested using a standard ohmmeter for broken welds.

3. Acceptance: The resistance between each pair of test leads shall not exceed 150% of the total wire resistance as determined from published wire data.

B. Test Lead Trenching And Backfill

1. Responsibility: The District representative, at his discretion, shall inspect wire trenches, backfill material and compaction methods.

2. Method: The trench depth, bottom padding, and backfill material shall be visually inspected prior to backfilling. Compaction and surface finish inspection shall be per Section 02223.

3. Acceptance: Conformance with the specifications and good workmanship.

C. Test Station Installations

1. Responsibility: The District representative shall inspect final test station installations.

2. Method: Visual inspection.

3. Acceptance: Post and at-grade test stations shall be fully installed and finished as indicated in the drawings and described in these specifications. Wire in post-mounted stations shall be connected to the panel and properly labeled. Enclosures, conduit and posts shall be fully secured. At-grade test stations shall be mounted in the pavement or

concrete pad. All wires shall be of proper length and identified with brass tags stamped and attached as specified herein. All work shall be in compliance with this specification section and consistent with good workmanship.

D. Insulating Flange Kits

1. Responsibility: Insulating flanges shall be inspected and tested by the Corrosion Engineer retained by the District. Buried insulators must be tested and approved prior to application of wax tape and backfilling.

2. Method: The assembled flange shall be tested with a Gas Electronics Model 601 Insulator Checker or equivalent instrument that is specifically designed for the testing of insulating flanges. The testing shall be done in accordance with NACE RP0286-97. If a short is indicated, each bolt shall be tested to verify the integrity of each insulating sleeve before the flange is disassembled. The contractor shall provide assistance in finding any and all shorts or shorted bolts.

3. Acceptance: The installation of the insulating flange kit shall be shall be considered complete when the testing instrument indicates that no shorts or partial shorts are present. Any deflection of the meter, no matter how small, indicates a short. All disassembly and re-assembly necessary for acceptance shall be done at no additional cost to the District.

4. Retest: All repaired insulating flanges shall be re-tested as indicated above until they pass. All re-testing shall be done at no additional cost to the District.

E. Wax Tape Wrap

1. Responsibility: The District representative shall inspect all completed wax tape wrapping for compliance with these specifications prior to backfilling.

2. Method: Visual inspection.

3. Acceptance: Conformance with this specification and good workmanship. The wax tape must be tight and have no air pockets and each individual bolt; nut or coupling tie-rod must be individually wrapped. The plastic outer wrap shall be have three layers and shall be neat and tight against the wax tape.

4. Pipe Tape Overwrap: All flange 18-inches or over shall have their edges overwrapped with pipe tape as described above.

F. Pipeline Continuity Through Bonded Or Mechanical Joints

1. Responsibility: The Corrosion Engineer retained by the District shall verify the continuity of buried metallic pipe where continuity is required. All sections that contain non-welded (bonded) joints, in-line mechanical joints, i.e., flanges, valves couplings and flex joints shall be tested.

2. Method: Continuity is verified when the measured linear resistance of section of pipe being tested is approximately equal its theoretical value. Resistance shall be measured by the linear resistance method. A direct current shall be impressed from one end of the test

section to the other (test station to test station) using a DC power supply (battery). A voltage drop is measured through the test section at several current levels. The resistance (R) is calculated using the equation R = dV/I, where dV is the voltage drop and I is the current. The resistance shall be calculated for three or four different current levels.

3. Acceptance: Acceptance is reasonable comparison of the measured resistance with the calculated or theoretical resistance. The measured resistance shall not exceed the theoretical resistance by more than 130%. The theoretical resistance is the sum of the pipe resistance and the bond (wire or clip) resistance.

4. Deficiencies: If a discontinuity or a high resistance is found within a section of pipe that section is defective. It is the contractor's responsibility to locate, excavate, and repair or replace all bonds that are found to be damaged or missing. Continuity tests shall be repeated after repairs are made. All continuity repairs and re-testing shall be done at no additional cost to the District.

5. Test Scheduling: Continuity testing shall be scheduled as soon as possible after the pipe is installed and fully backfilled. Early testing will allow excavations and repairs to be made, if needed, before the surface is paved or finished.

G. Casing Isolation

1. Responsibility: The Corrosion Engineer retained by the District shall test all casings to verify that they are metallically isolated from the pipe.

2. Method: The casing shall be considered fully isolated if the difference between the structure-to-soil potential of the casing and the pipe is more than 30 millivolts. If this potential difference is less than 30 millivolts the casing and the pipe may still be adequately isolated. In this case the Corrosion Engineer shall submit a test approach and test data to verify isolation.

3. Acceptance: A potential difference of 30 millivolts or greater or the District's representative acceptance of the Corrosion Engineer's test report.

H. Potential Pipe-To-Soil Performance Summary

1. Responsibility: The Corrosion Engineer retained by the District shall conduct a pipe-to-soil potential survey after all test stations are installed.

2. Method: Native or initial pipe-to-soil potential shall be measured at all test stations and with all wires in each test station. All potentials shall be measured using a high impedance digital voltmeter and suitable leads with respect to a standard, recently-calibrated copper\copper sulfate reference electrode.

3. Report: The potential data shall be submitted in tabular form. The as-built location of each test reading shall be fully described.

4. Acceptance: A complete report and certification by the Corrosion Engineer that the test method was in accordance with industry standards and NACE RP0169.

I. Report

1. Verbal Report: All deficiencies found during testing or inspection shall be reported immediately to the District representative.

2. Written Report: The Corrosion Engineer retained by the District shall prepare a final report that contains the following:

   a. Verification that all test stations have been installed and installed properly.

   b. Verification that all insulating flanges have been tested with an approved test instrument and that all have passed.

   c. Field continuity test data, calculations of actual (measured) pipe resistance from the data and calculations of the theoretical resistance for each section of pipe tested. The report shall include a statement that each section of pipe that contains a bonded or mechanical joint was tested and that the resistance of each section tested was less than or equal to 130% of the theoretical resistance.

   d. Verification that all casings are isolated from the pipe.

   e. Tabulation of all pipe-to-soil potential survey data.

   f. Other information that the Corrosion Engineer believes is pertinent with respect to the corrosion status or long-term performance of the pipeline or structure installed.

J. Compliance With Specifications

1. Deficiencies: Any deficiencies or omissions in materials or workmanship found by these tests shall be rectified by the contractor at his expense. Deficiencies shall include but are not limited to: damaged wire; broken or missing test leads; improper or unclean wire trench backfill; lack of 18-inch slack wire in test boxes; improperly mounted or located test boxes; shorted insulators; discontinuous pipe; shorted casings; and other deficiencies associated with the workmanship, installation and non-functioning equipment.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15041**

# CHLORINATION OF DOMESTIC WATER MAINS AND SERVICES FOR DISINFECTION

## PART 1 - GENERAL

A. Description

This section describes requirements for disinfection of domestic water mains, services, appurtenances and connections by chlorination and all requirements for bacterial testing of the facilities, and obtaining subsequent clearances for operations issued by the District and all state and local health agencies having jurisdiction.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

Hydrostatic Testing of Pressure Pipelines: 15042

C. Referenced Standard

All domestic water mains, water services, attached appurtenances, and connections, if any, shall be disinfected in accordance with AWWA C601, C651-99 and as specified herein.

D. Application

Before being placed in service or connected to existing facilities, all facilities shall be chlorinated. Chlorine may be applied by either direct chlorine gas feed, direct liquid chlorine feed, or calcium hypochlorite tablets for lines up to 10-inch in diameter with a total length less than 100-feet. Disinfection of pipe segments over 100 feet in length or larger than 10-inch diameter shall be by chlorine gas or liquid chlorine. Liquid chlorine shall be applied per AWWA C651 Section 4.4.3.

E. Retesting

Retesting of the system may be required if 90 days have passed between the date of testing and acceptance by the District.

F. Submittals

The Contractor shall submit a Disinfection Plan per Section 1300. The Disinfection Plan shall address trench treatment, flushing, chlorination, sampling and bacteriological testing procedures, and dechlorination procedures per Section 15041 and AWWA C651. The Contractor shall submit this plan 7 working days prior to beginning this work.

## PART 2 - MATERIALS

A. Chlorine Gas.

Chlorine gas shall be supplied and converted from its liquid form to a gas as detailed in AWWA C651 Sections 2.1 and 5.2.

BA. Calcium Hypochlorite Tablets

Calcium hypochlorite tablets shall have an average weight of 0.009 pounds each and shall contain not less than 70% of available chlorine.

B. Liquid Chlorine

Liquid Chlorine shall conform to AWWA C651 4.1.1 or AWWA C651 4.1.2.

## PART 3 - EXECUTION

A. Procedure

1. Contractor shall notify the District two (2) working days prior to chlorination of facilities.

2. All required corporation stops and other plumbing materials necessary for chlorination or flushing of the main shall be installed by and at the expense of the contractor.

3. All mains shall be thoroughly flushed prior to disinfection. Only the direct chlorine gas fuel method shall be used if contaminating material has entered the line.

4. Every service connection served by a main being disinfected shall be tightly shutoff at the curb stop before water is turned into the main. Care shall be taken to expel all air from the main and services during the filling operation.

5. Clean all pipe, fittings and valves and swab with chlorine disinfection prior to assembly.

6. Water shall be fed slowly into the pipeline with chlorine applied in amounts to produce a dosage of not less than 50 ppm nor more than 100 ppm in all sections of the pipeline and appurtenances.

7. Treated water shall be retained in the system for a minimum of 24 hours and shall contain a chlorine residual of not less than 25 ppm at the end of the retention period in all sections being disinfected.

B. Concurrent Testing

Disinfecting the mains and appurtenances, hydrostatic testing, and preliminary retention may run concurrently for the required 24-hour period, but in the event there is leakage and repairs are necessary, additional disinfection shall be made by injection of chlorine solution into the line as provided hereinafter.

C. Additional Disinfection

If the tests are not satisfactory the contractor shall provide additional disinfection as required by AWWA C651.

D. Flushing

After chlorination, the water shall be flushed from the line, in accordance with AWWA C651, at its extremities until the replacement water tests are equal chemically and bacteriologically to those of the permanent source of supply. The chlorinated water may be used later for testing other lines, or if not so used, shall be disposed of by the contractor, as designated in AWWA C651, Section 6.2. The contractor shall be responsible for all costs to dechlorinate the water and shall obtain all permits before discharging water into storm drain or watercourse. Flushing shall be in accordance with State and local regulations. The District will not be responsible for loss or damage resulting from such disposal.

E. Bacteriological Testing

The sampling and bacteriological testing procedure for the newly disinfected facilities shall be in accordance with AWWA C651-99, Section 5.1. The sampling and bacteriological testing procedure for main repairs shall be in accordance with AWWA C651-99, Section 4.7. The contractor shall provide sampling containers approved by the District and the contractor shall notify the District two (2) working days prior to collecting samples. A District representative shall be present during the collection of the samples. The contractor shall deliver the samples to a DOHS State of California approved testing laboratory. The contractor shall be required to provide the District with signed copies of all test results and chain of custody documents.

All mains and services must successfully pass bacteriological tests prior to connecting to the existing system. Services must be tested per the following procedure. A minimum of 10 percent of water services or 1 water service lateral, which ever is greater, must be tested. If this first water service test fails, then a minimum of 20 percent of water services or 2 water service laterals, whichever is greater, must be tested.

F. Cutting Into Existing Mains

Following the opening of an existing domestic water main, the interior of all accessible pipes and fittings shall be swabbed with a hypochlorite solution. The drained portion of the existing line and any new section shall be flushed from two directions toward the cut-in, if possible.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15042**

# HYDROSTATIC TESTING OF PRESSURE PIPELINES

## PART 1 - GENERAL

A. Description

This section describes the requirements and procedures for pressure and leakage testing of pressure distribution mains.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

C. Connection to Existing Mains

The test shall be made before connecting the new line with the existing District pipes and mains.

D. Tester Procedure Plan

Contractor shall submit to the District a Test Procedure Plan. All testing shall be performed by a District-approved testing company or the design engineer who will be required to provide the District representative with certified testing results. Tester will have a gage and meter, calibrated annually. No testing shall take place against closed valves.

E. Requirements Prior to Testings

1. Before testing, the pipe trench shall be backfilled and compacted to the ground surface per Section 02223.

2. All concrete anchor blocks shall be allowed to cure a sufficient time to develop a minimum strength of 2,000 psi, but not less than five (5) days, before testing, unless otherwise directed by the District representative.

3. Steel pipelines shall not be tested before the mortar lining and coating on all of the pipe lengths in the line have attained an age of 14 days. Cement-mortar lined pipe shall not be filled with water until a minimum period of eight hours has elapsed after the last joint in any section has been made.

4. All surrounding utilities shall be installed prior to testing.

F. Testing before Final Pavement

All pipelines shall be satisfactorily pressure tested prior to the placement of final pavement.

## PART 2 - MATERIALS

A. Water

1. The same water used for chlorination of the pipeline may be used to fill the line for pressure testing.

2. Make up water for testing shall be domestic water. Contractor shall pay for all make up water.

3. Temporary manual air release valves shall be utilized when requested by the District.

4. Test bulkheads shall be utilized in testing. Testing against valves will not be permitted..

## PART 3 - EXECUTION

A. General

1. All labor, materials, tools, and equipment for testing shall be furnished by the contractor.

2. The pipeline shall be subjected to a field hydrostatic pressure of 200 psi for pipe 12 inches or greater for a period of four hours. For pipelines 10 inches or smaller, the pipe shall be subjected to a field hydrostatic pressure of 50 psi in excess of the anticipated working pressure of the pipe for a period of four hours.

3. The water necessary to maintain test pressure shall be measured through a meter. The leakage shall be considered as the amount of water entering the pipe during the test, less the measured leakage through valves and fittings. Leakage shall not exceed the rate specified. Any noticeable leaks shall be stopped, and any defective pipe shall be replaced with new sections.

4. The test shall further be conducted with valves open, and the open ends of pipes, valves, and fittings suitably closed. Valves shall be operated during the test period.

5. In hilly areas, it may be necessary to conduct the test in segments so that no pipe section is tested at less than the pipe pressure class plus 50 psi, nor more than 1½ times the pipe pressure class.

B. Field Test Procedure

1. The pipeline shall be filled at a rate such that the average velocity of flow is less than 1 fps. At no time shall the maximum velocity of flow exceed 2 fps. The following table has been provided to relate the velocity filling rate to an equivalent volume flow rate.

Filling Rate in gpm equivalent to filling velocities of 1 fps

| Normal Size (inches) | Flow Rate Q (gpm) |
|---|---|
| 4 | 38 |
| 6 | 88 |

| | |
|---|---|
| 8 | 158 |
| 12 | 353 |
| 16 | 624 |

2. All air should be purged from the pipeline before checking for leaks or performing pressure or acceptance tests on the system. To accomplish this, if air valves or hydrants or other outlets are not available, taps shall be made at the high points to expel the air, and these taps shall be tightly plugged afterwards.

3. After the pipeline has been filled and allowed to sit a minimum of 24 hours (48 hours for mortar-lined pipelines), the pressure in the pipeline shall then be pumped up to the specified test pressure. If a large quantity of water is required to increase the pressure during testing, entrapped air, leakage at joints, or a broken pipe can be suspected. TESTS SHOULD BE DISCONTINUED until the source of trouble is identified and corrected.

4. When the test pressure has been reached, the pumping shall be discontinued until the pressure in the line has dropped 25 psi, at which time the pressure shall again be pumped up to the specified test pressure. For HDPE pipe, a resting period of a minimum of 30 hours shall be used. This procedure shall be repeated until four hours have elapsed from the time the specified test pressure was first applied. At the end of the four-hour period, the pressure shall be pumped up to the test pressure for the last time.

5. The leakage shall be considered as the total amount of water pumped into the pipeline during the four-hour period, including the amount required in reaching the test pressure for the final time. Leakage shall not exceed the rates in the tables below. If the size, pipe material, or pressure fall outside of the table listed below, the leakage amount will be determined by the engineer.

DIP LEAKAGE ALLOWANCE

| Pipe Size (inches) | Test Pressure (psi) | Allowable Leakage Gallons per four hours per 1,000 feet of pipe |
|---|---|---|
| 4 | 250 | 1.7 |
| 6 | 250 | 2.6 |
| 8 | 250 | 3.4 |
| 12 | 225 | 5.4 |
| 16 | 225 | 7.2 |
| 20 | 225 | 9.0 |
| 24 | 225 | 10.8 |

PVC LEAKAGE ALLOWANCE

| | Test Pressure | | Allowable Leakage Gallons per four hours per 1,000 feet of pipe | |
|---|---|---|---|---|
| Pipe Size (inches) | Class 150 (psi) | Class 200 (psi) | Class 150 | Class 200 |
| 4 | 200 | 250 | 1.5 | 1.7 |
| 6 | 200 | 250 | 2.3 | 2.6 |

| | | | | |
|---|---|---|---|---|
| 8 | 200 | 250 | 3.0 | 3.4 |
| 12 | 225 | 250 | 5.1 | 5.7 |

STEEL PIPE ALLOWANCE

For steel pipe, the allowable loss rate shall be determined by the following formula:

$$L=\frac{HND(P)^2}{7{,}400}$$

In which:

| | | |
|---|---|---|
| L | = | Allowable loss (gallons) |
| H | = | Specific test period (hours) |
| N | = | Number of rubber-gasketed joints in the pipe tested * |
| D | = | Diameter of the pipe in inches |
| P | = | Specified test pressure (psig) |

* Flanged, welded and grooved joints shall have zero leakage. The test period shall be four hours for 24-inches in diameter and smaller pipe. The test period shall be eight hours for pipes greater than 24-inches in diameter.

6. Any noticeable leak shall be stopped and all defective pipe, fittings, valves, and other accessories discovered in consequence of the test shall be removed and replaced by the contractor with sound material, and the test shall be repeated until the total leakage during a test of four hours (4) duration does not exceed the rate specified above.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15043**

# LEAKAGE AND INFILTRATION TESTING OF NON-PRESSURE PIPELINES

## PART - 1 GENERAL

A. Description

This section describes the requirements and procedures for leakage and infiltration testing of gravity sewer systems, in accordance with ANSI/ASTM C828, Low Pressure Air Test.

B. Related Work Specified Elsewhere

1. PVC Sewer Pipe: 02715

2. Hydrostatic Testing of Pressure Pipelines: 15042

C. Testing

1. General: All tests shall be made in the presence of the District representative.

2. Leakage: Each section of sewer between two successive manholes shall be tested for leakage and the leakage test shall be made on all manholes.

3. Infiltration: The infiltration test shall be made where excessive groundwater is encountered in the trench.

4. Retesting: Even though a section may have previously passed the leakage or infiltration test, each section of sewer shall be tested subsequent to the last backfill compacting operation if, in the opinion of the District representative, heavy compaction equipment or any of the operations of the contractor or others may have damaged or affected the structural integrity or watertightness of the pipe, structure, and appurtenances.

5. Other Utilities: Official District tests will not be made until after all the other utilities have been installed and their trench compaction verified.

6. Excessive Leakage or Infiltration: If the leakage or infiltration rate is greater than the amount specified, the pipe joints shall be repaired or, if necessary, the pipe shall be removed and relaid by the contractor.

7. Acceptance: The sewer will not be accepted until the leakage or infiltration rate, as determined by test, is less than the maximum allowable.

8. House Laterals: House laterals are not to be connected until after the sewer main has been successfully tested.

9. Force Mains: Force mains shall be pressure tested per section 15042.

## PART 2 - MATERIALS

The contractor shall furnish all equipment and materials required for testing.

## PART 3 - EXECUTION

A. Air Test for PVC Gravity Sewers

1. Test Section: Each section of sewer between two successive manholes shall be tested by plugging all pipe outlets with suitable test plugs.

2. Addition of Air: Air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pipe shall have a blowoff valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig.

3. Internal Pressure: The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig.

4. Minimum Duration for Allowable Pressure Drop: The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured. The results shall not be less than the minimum permissible duration for air test pressure drop shown in Table I.

TABLE I

| MINIMUM DURUATION FOR AIR TEST PRESSURE DROP | |
|---|---|
| Pipe Size (Inches) | Time (Minutes) |
| 4 | 2-1/2 |
| 6 | 4 |
| 8 | 5 |
| 10 | 6-1/2 |
| 12 | 7-1/2 |
| 15 | 9-1/2 |

5. Retest: If the pressure drop from 3.5 psig to 3.0 psig occurs in less time than the above-tabulated or calculated values, the pipe shall be overhauled and, if necessary, replaced and relaid until the joints and pipe shall hold satisfactorily under this test.

B. Infiltration Test

1. Preparation of Test Section: The end of the sewer at the upper structure shall be closed to prevent the entrance of water, and pumping of groundwater shall be discontinued for at least three days, after which the section shall be tested for infiltration.

2. Allowable Infiltration Rate: The infiltration shall not exceed 0.025 gpm per inch of diameter per 1,000 feet of main line sewer being tested, not including the length of laterals entering that section.

3. Excessive Infiltration: Where infiltration in excess of the allowable amount is discovered before completion and acceptance of the sewer, the sewer shall be immediately uncovered and the amount of the infiltration reduced to a quality within the specified amount of infiltration, before the sewer is accepted.

4. Individual Leaks: Even if the infiltration is less than the allowable amount, any individual leaks that may be observed shall be stopped as ordered by the District representative.

5. Completion of Tests: All tests must be completed before the street or trench is resurfaced, unless otherwise directed by the District representative.

C. Deflection Test

1. General: All PVC main line pipe shall be tested for deflection, joint displacement, or other obstruction by passing a rigid mandrel through the pipe by hand, not less than 30 days after completion of the trench backfill, but prior to permanent resurfacing. The mandrel shall be a full circle, solid cylinder, or a cylinder, approved by the District as to design and manufacture. The circular cross section of the mandrel shall have a diameter of at least 95 percent of the specified average inside pipe diameter of the pipe, as follows:

| Pipe Material | Nominal Size Inches | Minimum Mandrel Diameter Inches |
|---|---|---|
| PVC-ASTM D 3033 | 6 | 5.169 |
| (SDR 35) | 8 | 7.309 |
| | 10 | 9.137 |
| | 12 | 10.963 |

D. Manhole Test (If required in the contract specifications)

1. General: Water tightness of manholes shall be tested in connection with tests of sanitary sewers, or at the time the manhole is completed and backfilled.

2. Plugs: All manhole inlets and outlets shall be plugged with approved stoppers or plugs.

3. Fill Level: The manhole shall be filled with water to 2-inches below the bottom of the tapered cone section, with a minimum depth of 4 feet and a maximum depth of 20 feet. The water shall stand in the manhole for a minimum of one hour to allow the manhole material to reach maximum absorption. Before the test is begun, the manhole shall be refilled to the original depth as needed.

4. Test Requirements: The drop in water surface shall be recorded after a period of from 15 minutes to one hour. The time of the test shall be determined by the District representative and may be varied to fit the various field conditions. The maximum allowable drop in the water surface shall be 1/2 inch for each 15-minute period of testing.

5. Visible Leaks: Even though the leakage is less than the specified amount, the contractor shall stop any leaks that may be observed, to the satisfaction of the District representative.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15050**

# HOT TAP CONNECTIONS

## PART 1 - GENERAL

A. Description

This section describes materials, requirements and procedures for hot tap (system under pressure) connections to existing distribution systems.

B. Related Work Specified Elsewhere

| | | |
|---|---|---|
| 1. | Existing Facilities | 01045 |
| 2. | Chlorination of Domestic Water Mains for Disinfection | 15041 |
| 3. | Hydrostatic Testing of Pressure Pipelines | 15042 |
| 4. | Copper, Brass and Bronze Pipe, Fittings and Appurtenances | 15057 |
| 5. | Cement-Mortar Lined and Coated Steel Pipe | 15076 |
| 6. | Manual Valves | 15100 |

C. Approved Manufacturers

1. Service Saddles and Corporation Stops

   See Section 15057

2. Tapping Sleeves

   Mueller JCM 432

3. Tapping Valves

   See Resilient Seated Wedge Gate Valves Section 15100

D. Direct Tap

All taps into existing pipes will be made through a service saddle, tapping sleeve, welded nozzle or welded coupling. Taps of the same size as the pipe are not permitted. Size on size connections shall be tees. Saddles are required for all taps. Direct taps are not permitted.

## PART 2 – MATERIALS

A. Service Saddles and Corporation Stops

Service saddles and corporation stops shall comply with Section 15057.

B. Tapping Sleeves

1. Tapping sleeves onto pipelines 12-inch and smaller shall be full circle cast iron with mechanical joint end glands or fabricated stainless steel or as approved by District Engineer.

2. Gaskets shall be Bunz-N rubber with a wide cross section.

3. Tapping sleeves onto 14-inch and larger ACP shall be fabricated steel with mechanical joint ends. All fabricated parts shall be epoxy coated per Section 09900. All bolts and trim hardware shall be Type 316 stainless steel.

C. Tapping Valves

Tapping valves shall be flanged resilient seat wedge gate valves per Section 15100.

D. Weld Nozzles

Weld nozzles and reinforcing plates shall be fabricated steel per Section 15076.

## PART 3 – EXECUTION

A. Notification

The contractor shall provide proper notification to the District inspector prior to making a hot tap connection per Section 01045.

B. Verification

The contractor shall pothole the proposed connection to verify the outside diameter, location and type of pipe to be tapped.

C. Surface Preparation

The pipe barrel to be tapped shall be thoroughly cleaned with a wire brush to provide a smooth, hard surface for the saddle, sleeve or nozzle.

D. Service Saddle and Corporation Stop

Service saddles and corporation stops will be installed onto ACP, DIP OR PVC mains in accordance with the manufacturer's accordance and Section 15057. The outlet shall be oriented to comply with the intended use of the service connection.

E. Weld Nozzles

Nozzles and reinforcing plates are to be welded onto steel pipe shells in accordance with Section 15076 and MCWD Standard Plan W-9. The connection is to be air tested in the presence of the District inspector prior to making the tap.

F. Tapping Sleeves

Tapping sleeves shall be installed per District MCWD Standard Plan W-9, and as modified below.

1. The tapping sleeve shall be installed in accordance with the manufacturer's instructions and to the satisfaction of the District representative.

2. The pipe barrel shall be thoroughly cleaned with a wire brush to provide a smooth, hard surface for the sleeve.

3. The sleeve shall be supported independent of the pipe during the tapping operation.

4. The sleeve shall be pressure tested in the presence of the District representative prior to tapping.

5. Thrust blocks shall be provided at the tapping sleeve per Standard Plan W-17 03300.

G. Tapping Valve

The tapping valve shall be installed on the tapping sleeve or weld nozzle per Section 15100. All flange bolts shall be Type 316 stainless steel.

H. Hot Tap

1. The hot tap into the existing pipe shall be made using the appropriate type of cutting machine and shell cutting bit for the material being tapped.

2. The company performing the hot tap must be approved by the District. The tapping machine shall be operated per the manufacturer’s operating instructions.

3. Proper care shall be taken to prevent cutting material from entering the pipeline. The tapping coupon must be extracted.

I. Mortar Coating Repair

The exterior mortar coating on welded steel pipe shall be repaired in accordance with Section 15076.

J. Disinfection

The interior of the tapping valve and connecting piping shall be sprayed with a sodium hypochlorite solution prior to connection.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15056**

# DUCTILE-IRON PIPE AND FITTINGS

## PART 1 - GENERAL

A. Description

This section includes materials, installation, and testing of ductile-iron pipe and fittings.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Concrete: | 03300 |
| 3. | Corrosion Protection and Joint Bonding | 13110 |
| 4. | Chlorination of Domestic water Mains for Disinfection: | 15041 |
| 5. | Hydrostatic Testing of Pressure Pipelines: | 15042 |

C. Approved Manufacturers

1. Fittings
   - Tyler
   - Trinity Valley
   - Dayton
   - Sigma
   - One Bolt
   - Or equal

2. Pipe
   - Pacific States
   - U.S. Pipe
   - American Pipe
   - Or equal

3. Gaskets
   - Johns Manville 109
   - Tripac 2000
   - John Crane Company Style 777

US Pipe
Or equal

D. Use of Gray-Iron Fittings

Gray-iron fittings may not be substituted for ductile-iron.

E. Submittals

Contractor shall provide submittals for review and approval by the engineer in accordance with these specifications.

## PART 2 - MATERIALS

A. Ductile-Iron Pipe

1. Pressure class or thickness class of DIP shall be determined by the design method detailed in AWWA C150 the "Thickness Design Method."

2. Ductile-iron pipe shall be manufactured in accordance with AWWA C151.

3. All ductile-iron pipe shall be pressure class shown on the plans for bell and spigot pipe, Class 52 for plain end pipe and thickness class 53 for flanged spools unless indicated otherwise.

4. All domestic and recycled water ductile-iron pipe shall be cement-mortar lined in accordance with AWWA C104. Lining thickness shall be the double thickness listed in AWWA C104, Section 4.8.

5. Unless otherwise called out on the plans, a "push-on" type joint shall be used. The joint dimensions and gasket shall be as specified in AWWA C111.

6. Where restrained joints are called, push-on joints shall be restrained with locking gasket rated for 250 psi operating pressure for DIP.

7. Flanges for ductile-iron pipe shall be the "screwed-on" type in accordance with AWWA C115.

8. Outlets for DIP shall be as follows:

| | |
|---|---|
| 2” or smaller: | bronze service saddle |
| 2-1/2”: | tapped tee or service saddle |
| 4” to 8”and larger: | D.I. tee fitting or service saddle |
| 12” and larger | D.I. tee fitting |

9. All buried ductile iron pipe for domestic and recycled water use shall have a factory applied bituminous coating of not less than 1 mil. in thickness.

10. All ductile iron pipe and fittings in sewer applications shall be polyurethane or polyethylene lined.

B. Ductile-Iron Fittings for PVC and Ductile Iron Pipe

1. Ductile-iron fittings shall be manufactured in accordance with AWWA C110 or C153. All fittings shall be epoxy coated and epoxy lined per AWWA C116.

2. Non-restrained fittings may be used where a thrust block is used. Non-restrained fittings may be mechanical to mechanical fittings, mechanical to flange fittings, one-bolt fittings, and flange to flange fittings. Push-on to push-on fittings shall not be used unless restraints are provided as described below.

   Restrained fittings shall be used where a thrust block is not specified. Where restrained joints are called, push-on joints shall be restrained with locking gasket rated for 250 psi operating pressure for DIP. Push-on joints shall be restrained with a mechanical type bell restraint for C-900 PVC pipe. Mechanical joint restraints shall be EBBA IRON, INC., MEGALUG, UNIFLANGE Series 1400, One-Bolt, or approved equal. Flanged fittings may be used.

   All fittings shall consist of stainless steel bolts and nuts, except wedge bolts, etc.

3. All buried ductile iron fittings shall have a factory applied bituminous coating of not less than 1 mil in thickness.

4. Unless otherwise indicated on the drawings, All fittings with flanged ends shall be ductile iron class 150. The gasket surface shall have a serrated finish of approximately 16 serrations per inch, approximately 1/32-inch deep, with serrations in either a concentric or spiral pattern. All flanges shall be flat faced. In addition, all flanges shall meet the following tolerances:

| | |
|---|---|
| Bolt circle drilling | $\pm$1/16 inch |
| Bolt hole spacing | $\pm$1/32 inch |
| Eccentricity of bolt circle and Maximum facing with respect to bore | $\pm$1/32 inch |

C. Gaskets

1. Gaskets for flanged joints shall be 1/8-inch thick, cloth-inserted rubber. Full face type gaskets with pre-punched holes shall be used where both flanges are flat face. Ring gaskets extending to the inner edge of the bolts may be used where a raised face flange is present.

2. Rubber gaskets for push-on joints shall be synthetic or natural rubber manufactured in accordance with AWWA C111.

D. Bolts and Nuts

1. All bolts and nuts shall be Type 316 stainless steel conforming to ASTM F593 G or H for bolts, and ASTM F594 with Tripac 2000 Blue Coating for nuts.

2. The length of each bolt or stud shall be such that between 1/4 inch and 3/8 inch will project through the nut when drawn tight.

E. Polyethylene Lining for Sewer Applications

1. Lining material for ductile iron pipe and fittings (sewer applications) shall be virgin polyethylene complying with ASTM D1248 and bonded to the interior of the pipe fittings by heat process. The lining material shall be compounded with inert filler and a compound which resists ultraviolet light.

2. The lining shall cover the interior surface of the pipe/fitting from the lain or beveled end to the rear of the gasket socket. The lining thickness shall be not less than 20 mils. The lining may taper at the ends, starting at 4 inches from the edge of the pipe. The minimum thickness at the end of the taper shall be 10 mils.

3. Each pipe shall be guaranteed against separation of the lining from the pipe. Random checks for operation will be made during construction and any indication of separation shall be cause for rejection. The test method shall be mutually agreed upon by the contractor and the District.

F. Polyurethane Lining System

1. The lining material shall be manufactured by Madison Chemical Industries, Inc. The material shall consist of a liquid-applied polyurethane coating especially formulated for use as a protective lining of pipelines carrying sewage. The material shall be Corropipe II Wasteliner. The dry film thickness (DFT) of the lining shall be 40 mils (0.040 inch) nominal.

2. In order to minimize potential dimensional and assembly problems, the coating thickness on sealing areas in the bell socket interior and on the spigot end of the pipe exterior shall be 8 mils (0.008 inch) nominal with a maximum of 10 mils (0.010 inch). Thicker coatings in these areas are acceptable if it is demonstrated that joint dimensions are within allowable tolerances after coatings.

3. The lining material shall be applied to the pipe and fittings by the certified applicator only (Contact Don McCage at Techno Coating at phone number (714) 635-1130 located at 1391 Allec, Anaheim, CA 92680 fax number: (714) 635-6357. The coating shall be holiday tested with a high voltage tester at 50 volts/mil of material thickness. The material shall be applied and repaired to the pipes and fittings in strict accordance with the manufacturer's requirements with no exceptions. District shall be notified five (5) days in advance of the coating installation for factory inspection during the application of the material.

4. All field cut ends shall be repaired and sealed prior to installation per the manufacturer's recommendations.

G. Lubricants

Lubricant for pipe insertion shall be food grade, and biodegradable.

## PART 3 - EXECUTION

A. General

Ductile-iron pipe and ductile iron fittings shall be installed in accordance with the applicable Sections of AWWA C600 and as specified herein.

B. Trenching, Backfilling, and Compacting

1. Trenching, backfilling, and compacting shall be in accordance with Section 02223 and as specified herein.

2. Backfill within the pipe zone, including the pipe base, shall be imported sand placed and compacted in accordance with Section 02223.

3. Backfill within the trench zone shall be native earth backfill placed and compacted in accordance with Section 02223.

C. Placement of Pipe in Trench

1. Lay pipes uphill if the grade exceeds 10%.

2. The radius of curvature of the trench shall determine the maximum length of pipe section that can be used without exceeding the allowable deflection at a joint. Combined deflections at rubber gasket, restrained joint, deflection coupling or flexible coupling joints shall not exceed 2 degrees or that recommended by the manufacturer, if smaller.

   The manufacturer's printed installation guide outlining the radius of curvature that can be negotiated with pipe sections of various length and the deflection couplings shall be followed if applicable.

3. The pipe shall be laid true to the line and grade shown on the plans within acceptable tolerances. The tolerance on grade is 1 inch. The tolerance on line is 2 inches.

4. Plastic Film Wrap

   All ductile-iron pipe and fittings buried underground shall be protected with plastic film wrap in accordance with AWWA C105, unless noted otherwise below. Wrap shall be a loose 8-mil-thick polyethylene tube. All joints between plastic tubes shall be wrapped with 2-inch-wide polyethylene adhesive tape, Polyken 900, Scotch wrap 50, or approved equal.

5. Fittings shall be supported independently of the pipe.

6. Until thrust blocks and supports are poured, fittings shall be temporarily supported by placing wooden skids under the bells so that the pipe is not subjected to the weight of the fitting.

7. All exposed flanges and other metal surfaces and all damaged coatings shall be coated after assembly with a mastic, 3M, Minnesota Mining and Manufacturing EC 244, or an approved equal. Stainless steel bolts shall not be coated.

D. Anchors and Thrust Blocks

Concrete anchors and thrust blocks shall be poured against wetted undisturbed soil in accordance with Section 03300 and MCWD Standard Plans W-10, W-17, and W-18.

E. Flanged Connections

1. Bolt holes of flanges shall straddle the horizontal and vertical centerlines of the pipe run.

2. Clean flanges by wire brushing before installing gasket.

3. Clean flange bolts and nuts by wire brushing, lubricate threads with anti-seize compound, and tighten nuts uniformly and progressively. Between 1/4 inch and 3/8 inch shall project through the nut when drawn tight.

4. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

F. Pipe Support

All exposed pipe shall be supported as detailed in the plans.

G. Disinfection

All domestic water piping shall be disinfected by chlorination in accordance with Section 15041.

H. Testing

All domestic water and recycled water piping shall be hydrostatically pressure tested in accordance with Section 15042.

I. Bonding

Bonding of joints to provide continuity for cathodic protection shall be as specifically shown on the project plans, or directed by the District representative. Bonding of joints shall be per Section 13110.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15057**

# COPPER, BRASS, AND BRONZE PIPE FITTINGS AND APPURTENANCES

## PART 1 - GENERAL

A. Description

This section includes materials and installation of copper, brass, and bronze pipe, fittings and appurtenances.

B. Approved Manufacturers

1. All materials shall be the appropriate model number specified on MCWD Standard Plans W-1, W-2, W-3, and W-4 as manufactured by the companies listed herein or approved equal.

2. Copper Tubing
   Cambridge Lee

3. Service Saddle
   Jones
   Mueller
   Ford

4. Corporation Stop
   Jones
   Mueller
   Ford

5. Insulating Pipe Bushings, Unions, or Couplings
   Pipeline Coating and Engineering Co.
   1566 East Slauson Avenue, Los Angeles
   Smith Blair
   Pipe Seal and Insulator Company

## PART 2 - MATERIALS

A. Copper Tubing

1. Copper tubing shall conform to the requirements of ASTM B 88 for seamless copper water tube. Piping located aboveground or suspended within vaults shall be Type L. Buried piping shall be Type K. Copper pipe shall be of domestic manufacture. Compression joints for connections are allowed if approved by the District Engineer.

2. If indicated in soils report, all copper lines shall be encased within a 8-mil polyethylene sleeve. Sleeves shall be color coded per Section 15151.

B. Brass Pipe, Nipples, and Fittings

Short threaded nipples, brass pipe and fittings shall conform to ASTM B 43, regular wall thickness, except that nipples and pipe of sizes 1-inch and smaller shall be extra strong. Threads shall conform to ANSI B2.1.

C. Bronze Appurtenances

1. All items specified herein shall be manufactured of bronze conforming to ASTM B 62, "Composition Brass or Ounce Metal Castings."

2. All size service saddles shall be of the double-strap type for any type of pipe. The straps (or bails) shall be flat and shall be manufactured of silnic bronze for ACP and of stainless steel for C900 PVC and ductile iron pipe. The body shall be manufactured of bronze and shall be tapped for an iron pipe thread. The seal with the pipe shall be affected with either a rubber gasket or an O-ring.

3. Corporation stops shall be ball valve type and shall be manufactured of bronze. The inlet fitting shall be a male iron pipe thread when used with saddle and the outlet connection shall be a compression type.

4. Copper setters shall be for 1-inch and 2-inch meter sizes or as approved by the District Engineer and using lead free solder. The inlet and outlet service line connections shall be for 1-inch services and for horizontal connections using compression type connections. A dual purpose type connection may be used for the outlet service line connection. The meter connection shall have a key type inlet and outlet valve. When using a copper setter that is sized larger than the meter, use appropriate adaptors as approved by the Engineer. Copper setters shall be 15-inches in height with a lock wing.

## PART 3 - EXECUTION

A. Copper Tubing and Fittings

1. Cut tubing square using a cutter designed for cutting copper tubing and remove burrs. Clean both the inside and outside of fitting and pipe ends with steel wool and muriatic acid. Prevent annealing of fittings and tubing when making connections. Do not miter joints for elbows or notch straight runs of pipe for tees.

2. Threads of fittings shall receive a liberal coating of pipe thread compound conforming with the requirements of ASTM B88, Type K.

3. Any damage to the fitting including but not limited to evidence of overtightening, misaligned threads, burring or scarring of machined faces, or any evidence of leakage shall be cause for rejection. If a leak is found to be caused by debris, the debris shall be cleared and the fitting visually inspected for damage before being charged. If the leak recurs upon charging of the line, the fitting shall be removed and replaced whether or not the cause can be determined.

4. Bends in soft copper tubing shall be long sweep. Shape bends with shaping tools. Form bends without flattening, buckling, or thinning the tubing wall at any point.

5. Buried piping shall be installed with some slack to provide flexibility in the event of a load due to settlement, expansion or contraction. A MINIMUM COVER OF 24 INCHES BELOW THE FINISHED STREET GRADE SHALL BE ADHERED TO. The tubing is to be bedded and covered with sand or select material as determined by the District representative.

6. All domestic service laterals shall be 1-inch minimum size copper tubing. End connections shall be compression type.

7. All 2-inch size services shall be installed with straight lengths of soft copper water tube Type K. End connections shall be compression type.

8. The service line shall extend perpendicular to the centerline of the street from the water main to the meter stop or structure, except in a cul-de-sac, where the service shall run in a straight line from the water main to the meter stop.

9. The service line shall be placed within an 8-mil polyethylene sleeve, color-coded for the type of service. The ends and splices in the sleeve shall be sealed with 20-mil tape.

B. Service Saddle

1. The service saddle shall be no closer than 18 inches to a valve, coupling, joint, or fitting.

2. The surface of the pipe shall be filed to remove all loose material and to provide a hard, clean surface before placing the service saddle.

3. The service saddle shall be tightened per manufacturer’s recommendation. Care shall be used to prevent damage or distortion of either the corporation stop or service saddle by over tightening.

4. The tap into the pipe shall be made in accordance with the pipe manufacturer's recommendation.

C. Installing Flange Bolts and Nuts

1. Lubricate bolt threads with anti-seize compound prior to installation.

2. Set flanged pipe with the flange bolt holes straddling the pipe horizontal and vertical centerlines.

D. Insulating Bushings and Unions

Pipe or fittings made of nonferrous metals shall be isolated from ferrous metals by nylon insulating pipe bushings, union, or couplings.

E. Backfill Material

The pipe zone material for all service laterals shall be compacted sand per Section 02223.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15064**

**PVC PRESSURE DISTRIBUTION PIPE**

## PART 1 - GENERAL

A. Description

This section includes materials, installation, and testing of polyvinyl chloride (PVC) distribution pipe.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Jacked Casing: | 02315 |
| 3. | Concrete: | 03300 |
| 4. | Painting and Coating: | 09900 |
| 5. | Chlorination of Domestic Water Mains for Disinfection: | 15041 |
| 6. | Hydrostatic Testing of Pressure Pipe: | 15042 |
| 7. | Ductile-Iron Pipe and Fittings: | 15056 |
| 8. | Copper, Brass and Bronze Pipe, Fittings, and Appurtenances: | 15057 |
| 9. | Combination Air and Vacuum Release Assembly: | 15089 |
| 10. | Manual Valves: | 15100 |
| 11. | Domestic and Recycled Facilities Identification: | 15151 |

C. Approved Manufacturers

1. J-M Manufacturing
2. Vinyltech

3. P W Pipe

4. Certainteed

5. Diamond Plastics

D. Application

1. Class 150PVC Pipe shall be used unless specifically shown otherwise on the plans.

2. PVC pipe shall be used as a valve can riser.

E. Reference Standard

Conform to AWWA C900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch for Water," unless noted otherwise below.

## PART 2 - MATERIALS

A. PVC Pipe

1. PVC pipe shall be manufactured in accordance with AWWA C900. The pipe shall have gasket bell end or plain end with elastomeric gasket coupling.

2. Laying lengths shall be 20 feet with the manufacturer's option to supply up to 15% random (minimum length 10 feet).

3. Each pipe length shall be marked showing the nominal pipe size and O.D. base, the AWWA pressure class, and the AWWA specification designation (AWWA C900). For domestic water application, the seal of the testing agency that verified the suitability of the material for such service shall be included.

4. Pipe for recycled lines shall be purple in color and marked as detailed in Section 15151.

B. Fittings

Fittings shall be ductile-iron conforming to Section 15056.

C. Manual Valves

Manual valves shall conform with Section 15100.

D. Service Saddles

All service saddles shall be designed for use on C900 PVC pipe and in accordance with Section 15057.

E. Lubricants

Lubricant for pipe insertion shall be food grade, and biodegradable.

## PART 3 - EXECUTION

A. General

1. The contractor shall install all the pipe, closure sections, fittings, valves, and appurtenances shown including pipe supports, bolts, nuts, gaskets, and jointing materials.

2. At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent the entrance of animals and foreign materials. The contractor shall maintain the inside of the pipe clean, sanitary, and free from foreign materials until its acceptance by the District.

3. Where closure sections are required by the contractor's installation operations, the sections shall be installed in accordance with the applicable sections of these specifications.

4. The pipe sections shall be laid in the trench to true alignment and grade in accordance with the drawings. The pipe grade shall be approved by the District.

5. The pipe shall not be laid along curves at a radius less than that listed below:

   The minimum-radius curves are determined by the limit of 2-degree deflection for PVC pipe joints with factory-assembled bell couplings:

| Length of Pipe Section | Minimum Curve Radius |
|---|---|
| 20 feet | 573 feet |
| 10 feet | 287 feet |

   For curves of smaller radius, use high- deflection couplings or ductile-iron fittings.

B. Installation

1. Trenching, backfilling, and compacting shall be in accordance with Section 02223 and as specified herein. Compacted pipe bedding material conforming to Section 02223 shall be installed in the bottom of the trench and compacted prior to placing pipe in the trench. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint and to assure the pipe is fully supported by the pipe barrel.

2. Proper care shall be used to prevent damage in handling, moving, and placing the pipe. Tools and equipment satisfactory to the District representative shall be provided and used by the contractor.

3. The contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source; shall assume full responsibility for any damage due to this cause; and shall pay for and perform the work to restore and replace the pipe to its specified condition and grade if any displacement occurs due to floating.

4. Pipe shall be cut by a method recommended in the pipe manufacturer's installation guide, as approved by the District representative. When pipe is cut and is to be joined to a cast-iron fitting or another piece of pipe the end shall be beveled in the field or place of manufacture to create a beveled end equal in quality to the machined ends of the pipe as furnished by the

manufacturer. Such machining shall not result in undercutting the wall thickness and must be approved by the District representative before installation.

5. All connecting parts of pipe, rings, couplings, and castings shall be cleaned before assembly. After bearing has been obtained, couplings shall be assembled in a proper manner (as determined by the District representative). The use of excessive lubricant will not be permitted, and the assembly of the couplings and rings shall be in accordance with the manufacturer's recommendations. Lubricant and rubber rings shall be supplied by the pipe manufacturer. All fittings and valves shall have joints that match the type of adjoining pipe.

6. 6. All fittings and valves shall be supported so that the pipe is not subjected to the weight of these appurtenances.

7. End of line fittings shall be restrained by thrust blocks.

7. Concrete thrust blocks of the size shown on MCWD Standard Plans W-17 and W-18 and as specified herein shall be provided at the location of all cast-iron fittings, valves, fire hydrants, and end of line plugs. Restrained joints are acceptable in lieu of thrust blocks.

8. Imported sand shall be used for backfill within the pipe zone per Section 02223.

9. Manual valves shall be installed in accordance with Section 15100.

10. Native earth backfill shall be placed and compacted within the trench zone in accordance with Section 02223, with approval of the District Engineer. <u>All backfill within 24 inches of a valve shall be clean, washed sand.</u>

C. <u>Installations within Jacked Casing</u>

1. Certain portions of the project, such as crossings of some roads, highways, and railroads, may be required to be installed within a jacked casing pipe.

2. The casing size and type shall be in accordance with Section 02315.

3. Work shall not proceed without permission of the District representative. Refer to MCWD Standard Plan W-19.

4. All pipe installed within a casing shall have restrained joints.

D. <u>Combination Air and Vacuum Relief Valves</u>

1. Air release valve assemblies and combination air and vacuum valves shall be installed at each point in the pipeline as shown on the drawings or as specified by the District representative.

2. The tap for the air valves shall be made in a level section of pipe no closer than 18 inches to a bell, coupling, joint, or fitting.

3. Air release valve assemblies shall be installed in accordance with MCWD Standard Plan W-14 and Section 15089.

E. Blow-Off Assemblies

1. Either in-line type or the end-of-line type blow off assemblies shall be installed in accordance with the standard drawings at locations noted on the plans and at such additional locations as required by the District representative for removing water or sediment from the pipeline.

2. The assembly shall be installed in a level section of pipe.

3. The tap for blow off in the line shall be no closer than 18 inches to a valve, coupling, joint, or fitting.

4. Blow offs shall not be connected to any sewer, submerged in any stream, or installed in any manner that will permit back siphoning into the distribution system.

5. Blow offs shall be installed in accordance with MCWD Standard Plans W-12 and W-15 and the applicable sections of these specifications.

F. Pipe Identification

Warning and locator tape shall be installed on all on-site recycled water pipelines and domestic water piping installed within the limits of a non-potable irrigation system. The pipe identification shall be in accordance with Section 15151.

G. Locator Wire

A bare 10-gauge stranded copper wire shall be placed continuously on the top center of the pipe. The wire shall not be spliced at any point, and shall be continuous from riser to riser. The wire shall be brought to the surface at valve locations and shall be accessible by removing the valve can cover. The wire shall be brought up the outside of the valve riser and folded over between the inside of the valve box and the valve riser. The wire shall be brought to within 6 inches of finish grade. The wire shall also be tapped in place by means of a plastic adhesive tape, placed at 10 foot intervals.

H. Thrust Blocks

1. Thrust blocks shall be constructed where shown on the drawings, or where directed by the District representative and as specified herein. In general, thrust blocks will be placed at all angles greater than 5 degrees, at changes in pipe size, at fittings, at hydrant ells, and at valves.

2. Fittings used with thrust blocks shall conform to Section 15056.

3. The area and design of the bearing surface shall be per MCWD Standard Plans W-17 and W-18.

4. The bearing surface shall be against undisturbed ground in all cases, except where unstable conditions are encountered. In unstable conditions, the bearing surface shall be as directed by the District representative.

5. Unless otherwise directed by the District representative, the blocking shall be placed so that the pipe and fitting joints are accessible for repair.

6. Metal harness of tie rods and pipe clamps shall be used to prevent movement if shown on the plans or directed by the District representative.

7. Exposed non-steel rods and clamps shall be coated with bituminous mastic per Section 09900.

8. Reinforcing steel tie-down rods shall be used on all line valves.

9. The depth of thrust blocks below valves shall conform with the size of the valve and shall be cut into the side of the trench a minimum of 12-inches on each side.

10. Concrete for thrust blocks shall be Class "A" per Section 03300.

I. Slope Protection

1. Slope protection shall be installed where shown on the plans in accordance with Section 02223, wherever the profile of the ground surface above the pipeline exceeds 20% and where no pavement or other surfacing is to be laid over the facility.

2. The installation of the slope protection shall be considered a part of the work, and the contractor shall include the expense in the contract cost.

3. A reinforced concrete encasement may be used as directed by the District representative. The encasement shall extend to within 1-foot of the ground surface and to within 1-foot of the toe of slope in which the pipe is constructed.

J. Chlorination

All domestic water pipelines shall successfully be chlorinated in accordance with Section 15041 prior to connection to the existing distribution system.

K. Hydrostatic Testing

All pipelines shall pass a hydrostatic pressure test in accordance with Section 15042.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15076**

**CEMENT-MORTAR LINED AND COATED STEEL PIPE**

## PART 1 - GENERAL

A. Description

This section describes materials, fabrication, installation, and testing of cement-mortar lined and coated steel pipe, in accordance with the applicable requirements of AWWA C200, C205, and C208.

B. Related Work Specified Elsewhere

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Painting and Coating: | 09900 |
| 3. | Corrosion Protection and Joint Bonding: | 13310 |
| 4. | Chlorination of Domestic Water Mains for Disinfection: | 15041 |
| 5. | Hydrostatic Testing of Pressure Pipelines: | 15042 |

C. Submittals

Shop drawings shall be submitted in accordance with the following:

1. Piping layout drawings showing location and dimensions of all pipe and fittings. Include laying lengths of valves, meters, and other equipment which determine piping dimensions. Label or number each fitting or piece of pipe and provide the following information for each item:

    a. Materials of construction, including references to industry standards being met (i.e. ASTM, ANSI, AWWA, etc.)

    b. Inside diameter, steel wall thickness, internal design pressure (cement-mortar lining and coating thicknesses) for each class of pipe to be furnished

    c. Order of installation and closure locations for length adjustment and for construction convenience

    d. Pipe invert station and elevation of each change of grade and alignment

    e. Elements of curves and bends, both in horizontal and vertical alignment, including elements of the resultant true angular deflections in cases of combined curvature

f.Paint primer type and thickness where joints and other cement-mortar holdbacks occur

g. Call out types and sizes, and dimensions of grooved-end collars, flanges, reinforcing collars, wrapper plates, and crotch plates

h. Limits of each reach of field-welded joints and of concrete encasement

i. Locations of manholes and other points of access

j. Location of valves and other mechanical equipment

k. Locations of bulkheads for field hydrostatic testing of pipeline

2. Manufacturer's certificates of compliance with prescribed industry standards (i.e. AWWA C200, C205, and C208, ASTM C150, etc.)

3. Detail drawings of:

a. Fittings

b. Joints

c. Butt Straps

d. Bulkheads and means of attachment to pipe

4. Mill test reports on each heat from which steel is rolled

5. Test reports on physical properties of rubber used in gaskets

D.Qualifications of Manufacturers

Only manufacturers who manufacture a complete lined and coated pipe can be qualified for this work. All pipe manufacturing operations shall be performed at the same location for all pieces of pipe. Supervisors of cement-mortar coating operations shall have at least two years continuous recent experience in the application of cement-mortar coating systems for steel pipe.

E. Design Criteria

1.The nominal diameter or inside diameter of the pipe and other fabricated steel sections as shown on the plans is the clear diameter of the lined pipe after the application of the interior mortar lining.

2.Obtain the following information from the plans: elevation of the pipe invert and of the final ground surface; alignment of the pipeline; nominal internal diameter, after cement-mortar lining; minimum pipe wall thickness; and location of welded, double-welded and butt-welded joints.

3.The design pressure is the pressure class shown on the construction plans.

F. Inspection

The District reserves the right to inspect materials, production, or testing of pipe at the manufacturer's plant.

## PART 2 - MATERIALS

A. Steel Pipe

Steel shall be ASTM A 36, ASTM A 283 Grade C or D, ASTM A 570 Grade 30 or 33, having a 0.25% maximum carbon content. Spigot material shall be ASTM A 476, Grade 1012 or 1020.

B. Cement

Cement for cement-mortar lining shall be ASTM C 150, Type II or V. Cement for cement-mortar coating shall be ASTM C 150, Type V.

C. Fittings

1. Definition: A fitting shall be defined as a piece of pipe other than a straight full length joint. Elbows, manhole sections, reducers, and sections of pipe with outlets shall be considered fittings.

2. Pressure Rating: Fittings 4 through 10-inches diameter shall be designed for 250 psi (or 50 psi greater than the class of pipe, whichever is greater) and conform to ANSI B16.9. Fittings 12-inches diameter and larger shall comply with AWWA C208.

3. Materials: Material for fittings 4 through 10-inches shall comply with ASTM A 234, Grade WPB. Material for fittings larger than 10-inches but less than or equal to 30-inches in diameter shall be the same as the pipe or shall comply with ASTM A 283 (Grade D), ASTM A 36, or ASTM A 570 (all grades). Cement-mortar lining and I.D. dimensions shall be the same as the specified pipe.

4. Allowable Stresses: Allowable circumferential stress at the design internal pressure shall not be greater than 40% of minimum yield stress. Minimum wall thickness of steel fitting shall be the same as the pipe of same size per ANSI B36.10.

5. Grooved End Fittings: Fittings smaller than 24-inches diameter with grooved ends shall have square cut grooves, flexible type, with dimensions as shown in AWWA C606, Table 3. Steel wall thickness shall be standard weight, ANSI B36.10. Cement-mortar lining and I.D. dimensions shall be the same as for the specified pipe.

6. Welding Fittings: Welding fittings shall be standard weight, Ladish Co., or approved equal.

D. Flanges

Flanges shall be AWWA C207, Class D, flat face, except where Class E or Class F flanges are required. Weld-neck flanges (conforming to ANSI B16.5) shall be provided for piping 4-inches in diameter and smaller to connect to flanged valves, fittings and equipment. Slip-on or weld-neck flanges shall be provided for piping 4-inches in diameter. Flanges shall match the connecting flanges on adjacent fitting, valve or piece of equipment.

E. Bolts, Nuts, and Gaskets for Joints and Flanges

Rubber gaskets shall be furnished for all joints, along with other parts, including flange gaskets, bolts, nuts, washers, jumper rods, and flange insulation kits. One bolt/gasket set shall be provided for each flange.

1. Materials: Bolts and nuts for flanges shall be Type 316 stainless steel conforming to ASTM A 193, Grade B8M for bolts, and ASTM A 194, Grade 8M for nuts.

2. Washers: A washer shall be provided for each nut. Washers shall be of the same material as the nuts.

3. Gaskets: Gaskets shall be composed of synthetic fiber with rubber binder and shall be fullface, 1/16-inch-thick Garlock 3400, Anchor 441, or approved equal.

4. Bolts for Flange Insulation Kits: Bolts for flange insulation kits shall conform to ASTM A 193, Grade B7. Nuts shall conform to ASTM A 194, Grade 2H.

F. Flange Insulation Kits

Flange insulation kits suitable for the design pressure of the pipeline shall be provided where shown on the drawings and shall be as specified in Section 13110, Corrosion Protection and Joint Bonding.

G. Grooved-End Couplings

Grooved-end couplings shall be malleable iron, ASTM A 47, or ductile iron, ASTM A 536. Bolts shall conform to ASTM A 183, 110,000 psi tensile strength. Gaskets shall be EPDM and shall conform to ASTM D 2000. Couplings for pipe 24-inches in diameter and smaller shall be flexible type, square cut groove, per AWWA C606, and shall be Victaulic Style 77, Gustin-Bacon Figure 100, or approved equal.

H. Outlets

1. Outlets 2-1/2-inches in Diameter and Smaller: Outlets of sizes 2-1/2-inches in diameter and smaller shall be of the thredolet type, per AWWA Manual M-11, Figure 13.23. Outlets shall be 3,000 pound WOG forged steel per ASTM A 105 or ASTM A 216, Grade WCB. Threads shall comply with ASNI B2.1. Outlets shall be Bonney Forge Co. "Thredolet," Allied Piping Products Co. "Branchlet," or for contracts between District and contractor, approved equal.

2. Outlets larger than 2-1/2-inches in Diameter: For outlets larger than 2-1/2-inches in diameter, flanged tees shall be used.

I. Length of Pipe Sections

Pipe sections shall be limited to 40 feet or less. For sections longer than 30 feet, spreader beams, and lifting straps shall be used to lift pipe sections at the third points.

J. Joints

1. Above Ground Joints: Joints above ground or in vaults and structures shall be flanged or grooved end.
2. Buried Joints: Buried joints shall be:

    a. Bell and Carnegie shape spigot with rubber gasket

    b. Bell-and-spigot lap welded

    c. Butt-strap joints may also be used for closures

3. Grooved-End Joints: Grooved-end joints shall be flexible, square-cut grooved, per AWWA C606.

K. Product Marking

Each length of straight pipe and each special shall be plainly marked at the bell end to identify the design pressure or head, the steel wall thickness, the date of manufacture, and the proper location of the pipe item by reference to the layout schedule. For beveled pipe, the degree of bevel and the point on the circumference to be laid uppermost shall be shown.

L. Painting and Coating

1. General: Unless noted otherwise, buried pipe shall be cement-mortar coated per AWWA C205.

2. Exposed Pipe: Pipe located above ground or in vaults and structures shall be epoxy lined and coated in accordance with Section 09900, Painting and Coating. Primer shall be shop applied.

3. Grooved-End Couplings: Grooved-end couplings shall be coated the same as the adjacent pipe.

M. Lining

Unless noted otherwise, pipe and fittings shall be cement-mortar lined per AWWA C205.

**PART 3 - EXECUTION**

A. General

1. Steel Cylinder Thickness: Steel cylinder thickness shall be minimum 10 gauge. Steel cylinder thickness shall be as called for on the construction plans. Pipe 12-inches in diameter and smaller shall be standard steel pipe per ASTM A53 “Welded and Seamless Steel Pipe”. It shall have a wall thickness known as standard weight per ANSI B36.10.

2. Fittings:

    a. Dimensions shall be per AWWA C208.

    b. Allowable circumferential stress at the design internal pressure shall not exceed 40% of minimum yield stress.

c. Outlet reinforcement at branches and openings shall be determined by the procedure given in ANSI B31.3, paragraph 304.3. If reinforcement is required, it shall be accomplished as described below:

1)The type of reinforcement for fittings with outlets shall be selected from the following table:

| Steel Pipe Reinforcement | Type of Reinforcement |
|---|---|
| Max. 0.5 | Collar |
| Max 0.7 | Wrapper Plate |
| To 1.0 | Crotch Plate |

Where $R = \frac{\text{ID outlet}}{\text{I.D. cyl. x sin B}}$

Where B = Angle between the longitudinal axis of the main run and the branch.

2) For collar reinforcement, select an effective shoulder width "W" of a collar from the inside surface of the steel outlet to the outside edge of the collar, measured on the surface of the cylinder of the main run, shall be selected such that:

$$W = (1/3 \text{ to } 1/2) \times \frac{\text{I.D. outlet}}{\sin B}$$

The minimum thickness "T" of the collar is determined by:

$$T = \frac{P \times \text{I.D. main run} \times \text{I.D. outlet} \times (2 - \sin B)}{4 \times F \times W \times \sin B}$$

Where P = Design internal pressure
F = Allowable design stress = 40% of minimum yield stress
B = As in part c.1 above

Collars may be oval in shape or rectangular with rounded corners.

3) For a wrapper plate, the above collar formula shall be used except that the wrapper is of thickness "T", its total width is (2W + ID outlet/sinB), and it wraps entirely around the main pipe.

4) Base crotch plate design on Swanson, H. S. et al., DESIGN OF WYE BRANCHES FOR STEEL PIPES, summarized in AWWA Manual M 11, Chapter 13.

5) Long Radius Curves and Vertical Curves:

For curved alignment, straight or beveled pipe of normal or one-half normal lengths pulled partially open on one side of the joint may be used with a welded mitered bend of up to 10 degrees next to the joint ring. Pipes with a bend in excess of 10 shall be designed as fittings.

Joints shall not be pulled more than one-half of the watertight extensibility provided by the bell and spigot design.

B. Fabrication

1. Reference Standards: Fabrication shall comply with ANSI B31.3, Chapter V. Welding procedure and performance qualifications shall be in accordance with Section IX, Articles II and III, respectively, of the ASME Boiler and Pressure Vessel Code.

2. Welding

a. The pipe cylinder shall be fabricated by butt welding, spiral seam, or straight seam. Girth welds shall be limited to two per pipe section, butt welded. Longitudinal welds shall be limited to one seam. Longitudinal joints of adjacent shell courses shall be staggered.

b. The shielded metal arc welding (SMAW) process shall be used for welding. All welding shall be done by qualified, certified welders.

c. Welds shall be in accordance with ANSI B31.3, paragraph 327.4.

d. Welding preparation shall comply with ANSI B31.3, paragraph 327.3. Limitations on imperfections in welds shall conform to the requirements in ANSI B31.3.

e. Welding electrodes shall comply with AWS A5.1.

f. Each layer of deposited weld metal shall be cleaned using a power-driven wire brush prior to depositing the next layer of weld metal. The final pass shall be cleaned by a power-driven wire brush.

g. A minimum of three passes shall be used for welded joints. Welds shall be full circumferential.

h. Beveled ends for butt welding shall conform to ANSI B16.25. Slag shall be removed by chipping or grinding. Surfaces shall be clean of paint, oil, rust, scale, slag, and other material detrimental to welding. When welding the reverse side, slag shall be chipped out before welding.

C. Joint Ring Protective Coating

The exposed portion of joint rings shall be coated with a 3-mil minimum thickness organic zinc pigmented coating meeting U.S. Federal Specification TT-P-641.

D. Shop Hydrostatic Test

The steel cylinder with joint rings shall be stressed to 75% of the minimum yield stress of the steel.

E. Shop Testing of Fittings

1. Dye Penetrant Test: Seams in fittings which have not been previously shop hydrostatically tested shall be tested by the dye penetrant method.

2. Air-Soap Test: In addition to the dye penetrant method of testing, the air-soap method with air at 5 psi shall be used on joints susceptible to being tested by such a method.

3. Pressure Test in Lieu of Dye Penetrant Test: In lieu of the dye penetrant method of testing, completed fittings may be hydrostatically tested using the field hydrostatic test pressure or 125% of the design pressure, whichever is higher.

F. Delivery of Small Parts

Small parts, consisting of gaskets, bolts, nuts, washers, jumper rods, and flange insulation kits, shall be delivered to the job site in suitable containers, each marked to identify the contents.

G. Installation

1. Delivery and Temporary Storage of Pipe at Site

a. Onsite Storage Limitation: Onsite pipe storage shall be limited to a maximum of one week, unless exception is approved by District.

b. Care of Pipe: Care shall be taken to avoid cracking of the cement mortar coating and/or lining on steel pipe. If necessary, plastic sheet caps shall be used to close pipe ends and keep coatings and linings moist.

2. Handling of Pipe

a. Moving Pipe: Pipes shall be lifted with handling beams or wide belt slings as recommended by the pipe manufacturer. Cable slings shall not be used. Pipe shall be handled in a manner to avoid damage to the pipe. Pipe shall not be dropped or dumped from trucks or into trenches under any circumstances.

b. Internal Pipe Braces: Internal braces placed in steel pipes shall be maintained until backfilling is completed.

c. Pipe Caps: Plastic caps placed over the ends of steel pipe shall not be removed until the pipe is ready to be placed in the trench. Plastic caps may be opened temporarily to spray water inside the pipe for moisture control.

d. Inspection of Pipe: The pipe and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound pipe shall be repaired or replaced. All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench.

3. Placement of Pipe in Trench

   a. General: Dewatering, excavation, shoring, sheeting, bracing, backfilling material placement, material compaction, compaction testing, and pipe laying requirements and limitations shall be in accordance with Section 02223: Trenching, Backfilling and Compacting.

   b. Sanitation of Pipe Interior: During laying operations, tools, clothing, or other materials shall not be placed in the pipe.

   c. Prevention of Entry into Pipe: When pipe laying is not in progress, including lunch-hour, the ends of the pipe shall be closed using vermin-proof plugs constructed in a manner to also prevent entry by children.

   d. Laying Pipe on Grades over 10 Percent: Pipes shall be laid uphill whenever the grade exceeds 10 percent.

   e. Pipe Bedding Thickness: Pipe bedding thickness shall be as specified in Section 02223, Trenching, Backfilling, and Compacting.

   f. Depressions at Joints and Pipe Sling Points: Depressions shall be dug into pipe base material to accommodate the pipe bell and external joint filler form, and to permit removal of the pipe handling slings.

   g. Placement of Pipe on Pipe bedding: Pipe shall be lowered onto the bedding and installed to line and grade its full length on firm bearing except at the bell and at sling depressions. Unless specified otherwise, the tolerance on grade shall be ¼-inch; the tolerance on line shall be 1-inch. Grade shall be measured along the pipe invert.

   h. Pipe Installation: Pipe shall be installed without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment. Precautions shall be taken to prevent pipe from being displaced by water entering trench. Damaged or displaced pipe shall be replaced or returned to specified condition and grade.

   i. Trench Curvature and Pipe Deflection: The radius of curvature of the trench shall be determined by the maximum length of pipe section that can be used without exceeding the allowable deflection at a coupling. Refer to the various referenced sections on pipe by type for allowable deflection. The deflection at any flexible joint shall not exceed that prescribed by the manufacturer of the pipe. The manufacturer's printed installation guide outlining the radius of curvature that can be negotiated with pipe sections of various lengths shall be followed.

   j. Equipment for Installation of Pipe: Proper implements, tools, and facilities as recommended by the pipe manufacturer's standard printed installation instructions shall be provided and used by the contractor for safe and efficient execution of the work. All pipe, fittings, valves, and accessories shall be carefully lowered into the trench using suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

k. Cutting and Machining Pipe: Cutting and machining of the pipe shall be accomplished in accordance with the pipe manufacturer's standard procedures for this operation. Pipe shall not be cut with a cold chisel, standard iron pipe cutter, nor any other method that may fracture the pipe or produce ragged, uneven edges.

4. Assembling Rubber Ring Joints

a. Cleaning Ends of Pipe: The ends of the pipe to be joined shall be cleaned of foreign material.

b. Lubrication: After placing pipe in trench, a nontoxic water soluble vegetable soap solution shall be applied to the inside of the bell of the pipe in the trench and to the rubber gasket and spigot groove of the pipe to be installed. The rubber gasket shall be stretched into the groove of the spigot end of the pipe and distributed uniformly around the circumference.

c. Joint Assembly: Without tilting the pipe to be installed, the spigot shall be inserted into the bell of the pipe. Come-a-longs or pipe jacks shall be used to drive spigot end home horizontally. The joint recess recommended by pipe manufacturer for made-up joints shall be maintained. Where deflections at joints are required for curved alignment, the allowable joint opening on one side shall not be exceeded. A feeler gauge shall be used to verify proper placement of each gasket.

5. Flanged Connections

a. Bolthole Alignment: Pipe shall be set with flange boltholes straddling the pipe horizontal and vertical centerlines.

b. Nuts and Bolts: Nuts and bolts shall be lubricated with antisieze graphite prior to installation.

c. Flange Wrapping: Flanges which connect with buried valves or other equipment shall be wrapped with sheet polyethylene film as specified for the valves and equipment. The wrap shall be extended over the flanges and bolts and secured around the adjacent pipe circumference with tape.

d. Coating: Flanges and non-stainless steel bolts shall be completely coated as specified in Section 09900, Painting and Coating.

6. Installation of Bends, Tees, and Reducers

Fittings shall be installed utilizing standard installation procedures. Fittings shall be lowered into trench by means of rope, cable, chain, or other acceptable means without damage to the fittings. Cable, rope, or other devices used for lowering fitting into trench, shall be attached around exterior of fitting for handling. Under no circumstances shall the cable, rope or other device be attached through the fittings interior for handling. Fittings shall be carefully connected to pipe or other facility, and joint shall be checked to insure a sound and proper joint.

7. Installing Threaded Piping

Threaded piping shall be reamed, deburred, and cleaned before making up joints. Thread lubricant shall be applied to threaded pipe ends before installing fittings, couplings, unions, or joints.

8. Completion of Interior Joints for Mortar-Lined Pipes - 20-Inches in Diameter and Smaller

The contractor shall install an extruded botyl rubber pipe joint sealant, G5-79 as manufactured by General Sealants, Inc., or approved equal. The pipe joint sealant shall be applied per the manufacturer's instructions.

9. Completion of Interior Joints for Mortar-Lined Pipes Greater Than 24-Inches in Diameter

a. Backfill Requirement: The trench shall be backfilled before applying mortar at joints.

b. Cleaning and Application of Cement Mortar: Working inside the pipe, foreign substances which adhere to the steel joint rings shall be removed, the surface cleaned, and stiff cement mortar packed into each joint. The mortar shall be finished with a steel trowel to match the lining in the adjoining pipes.

c. Removal of Excess Mortar: Excess mortar and other construction debris shall be removed from the pipe interior.

10. Pipeline Closure Assemblies

a. General: Pipeline closure assemblies shall be employed to unite sections of pipeline laid from opposite directions; to adjust the field length of the pipeline to meet structures, other pipelines, and points established by design stations; and to close areas left open to accommodate temporary test bulkheads for hydrostatic testing. Either follower ring design or butt strap design shall be used. Follower ring closures shall be installed as recommended by the pipe manufacturer.

b. Butt Straps: Shaped steel butt straps shall be centered over the ends of the pipe sections they are to join. On pipes 39 inches in diameter and smaller, butt straps shall be welded to the outside of the pipes with complete circumferential fillet welds equal in size to the thinnest part being joined. The details shown on the drawings shall be referred to when joining larger pipes.

c. General Requirements for Cement Mortar Lining for Closure Assemblies: Closure assemblies shall be cement-mortar lined to a mortar thickness at least equal to the adjoining standard pipe sections. The steel shall be cleaned with wire brushes and a cement and water wash coat applied prior to applying the cement mortar. Where more than a 4-inch joint strip of mortar is required, welded wire mesh reinforcement having a 2-inch by 4-inch pattern of No. 13 gage shall be placed over the exposed steel. The mesh shall be installed so that the wires on the 2-inch spacing run circumferentially around the pipe. The wires on the 4-inch spacing shall be crimped to support the mesh 3/8 inch from the metal surface. The interior mortar shall have a steel-trowled finish to match adjoining mortar lined pipe sections.

d. Lining Closure Assemblies for Pipes 24-Inches in Diameter and Smaller: For lining of closure assemblies on pipelines 24-inches in diameter and smaller, threaded 5-inch nipples with galvanized plugs shall be provided around the perimeter of the closure at third-point intervals to facilitate mortar lining of the interior surface.

e. Mortar Coating Exterior Surfaces of Closure Assemblies: The exterior of closure assemblies shall be reinforced with wire mesh as described in Paragraph 3 above. The surface shall be coated with mortar, or a poured concrete encasement to cover all steel to a minimum thickness of 1-1/2 inches. Exterior mortar shall be protected to retard drying while curing. Concrete shall be poured and vibrated on one side of the closure assembly only, until mortar is visible on the opposite side, after which the coating can be completed over the top of the assembly.

11. Welded Joints

a. Locations: Welded joints shall be provided where detailed on the plans.

b. Reference Standard: Welding shall be in accordance with AWWA C206. Welder's qualification shall be in accordance with Section IX of the ASME Boiler and Pressure Vessel Code. Current certifications shall be provided for all welders.

c. Sequence: Interior joints shall not be welded before completing the backfilling operations.

d. Joint Rings: Joint rings that are rusted or pitted where weld metal is to be deposited shall be cleaned by brushing or sand blasting.

e. Restrictions: Concrete or other coating adjacent to the joint rings shall not be heated.

f. Cleaning Requirements: Each layer of deposited weld metal shall be cleaned using a power-driven wire brush prior to depositing the next layer of weld metal.

12. Operations Incidental to Joint Completion

a. Hydrostatic Testing: Joint completion shall be planned to accommodate temporary test bulkheads for hydrostatic testing.

b. Bonding Pipe: Metallic jumper bonds or bars shall be installed on all non-welded pipe, as shown on plans and as specified within Section 13110: Corrosion Protection and Joint Bonding.

13. Completion of Exterior Pipe Joint for Cement-Mortar Coated Pipe

Outside joint recess shall be filled with cement-mortar grout using a fabric form placed around the joint and secured with steel straps. Grout shall be poured and rodded from one side only until it is visible on the opposite side. After approximately one hour, the joint shall be topped off with additional grout.

14. Thrust Restraint and Anchor Blocks

a. Location: Thrust restraint and anchor blocks shall be provided on all pressure pipelines, and shall be installed as shown on the plans and at all rubber gasketed fittings that are not otherwise restrained. Thrust restraint blocks or anchor blocks shall be installed at all valves, tees, crosses, ends of pipelines, and at all changes of direction of the pipeline greater than 10 degrees deflection either vertically or horizontally when joints are not otherwise restrained.

b. General Requirements: Thrust restraint and anchor blocks shall be of not less than 3,250 psi concrete (Class A); and shall provide a thrust bearing area to resist horizontal or downward thrust; and shall be of sufficient gross weight and area to give bearing against undisturbed vertical earth banks sufficient to absorb the thrust, allowing an earth bearing of 1,500 pounds per square foot maximum.

c. Thrust Restraint not called for on the Plans: Thrust restraint elements, where not called for on the plans, shall be sized for 150 percent of operating pipeline pressure. Prior to construction, thrust and anchor block sizing shall be submitted to the District for approval. Pipe clamps, tie-rods, and their assembly shall meet the requirements of the National Fire Protection Association Bulletin No. 24, latest edition.

d. Concrete Placement: Concrete shall be placed against wetted and undisturbed soil, and the exterior of the fitting shall be cleaned and wetted to provide a good bond with the concrete. The concrete interface with the fitting shall be an area of not less than the projected area of the fitting normal to the thrust resultant and centered on the resultant.

e. Accessibility to Joints and Fittings: Unless otherwise directed by the District, thrust restraint and anchor blocks shall be placed so that the pipe and fitting joints are accessible for repair. Placement shall include isolation of adjacent utilities and shall ensure that bearing is against undisturbed soil.

f. Harness and Tie-Rods: Metal harness or tie-rods and pipe clamps shall be used to prevent movement if shown on the plans or directed by the District. The rods and clamp harnessing arrangement shall be installed utilizing flanged harness hold-downs or lugged fittings and pipe with saddle clamps placed to bear against the pipe bells. Saddle clamps around the barrel of the pipe, which depend on friction or setscrews to prevent sliding of the clamp, are not acceptable. The pipe clamps, tie rods and their assembly shall meet the requirements of the National Fire Protection Association Bulletin No. 24, 1981 Edition. All surfaces of exposed and buried steel rods, reinforcing steel, bolts, clamps, and other metal work shall be coated before installation and touched up after assembly as specified in Section 09900, Painting and Coating.

g. In-line Valves: Reinforcing steel tiedown rods shall be used on all in-line valves.

15. Blowoff Assemblies

a. General: In-line type or end-of-line type blowoff assemblies per MCWD Standard Plans W-12 and W-15 shall be installed in accordance with the plans at

locations noted, and at such additional locations as required by the District for removing water or sediment from the pipeline.

b. Location: The assembly shall be installed in a level section of pipe. The tap for blowoff in the line shall be no closer than 18 inches to a valve, coupling, joint, or fitting unless it is at the end of the main. No tap will be permitted in any machined section of asbestos cement pipe.

c. Restrictions: Blowoffs shall not be connected to any sewer, submerged in any stream, or installed in any manner that will permit back siphoning into the distribution system.

16. Combination Air and Vacuum Release Valves

a. General: Air release valve assemblies and combination air and vacuum valves per MCWD Standard Plan W-14 shall be installed at each point in the pipeline as shown on the drawings or as specified by the District, and in accordance with Section 15089: Air-Release and Vacuum-Release.

b. Location: The tap for the air valves shall be made in a level section of pipe no closer than 18 inches to a bell, coupling, joint, or fitting. No tap shall be permitted in any machined section of asbestos cement pipe.

17. Aboveground Piping Installation/Support

a. General: Installation of aboveground pipeline materials and appurtenances include requirements for buried pipeline materials and appurtenances as applicable.

b. Supports: All exposed pipe shall be adequately supported with devices of appropriate design. Where details are shown, the supports shall conform thereto and shall be placed as indicated; provided, that the support for all piping shall be complete and adequate as herein specified, whether or not supporting devices are specifically called for. Pipe hangers and supports shall conform to the requirements of the latest editions of the MSS-SP58 and SP69 and ANSI/ASME B31.1.

c. Grooved-End Pipe and Fittings: Grooved-end pipe and fittings shall be installed in accordance with the coupling manufacturer's recommendations and the following:

1. Loose scale, rust, oil, grease, and dirt shall be cleaned from the pipe or fitting groove. The coupling manufacturer's gasket lubricant shall be applied to the gasket exterior including lips, pipe ends, and housing interiors.
2. Coupling shall be fastened alternately and evenly until coupling halves are seated.

18. Cathodic Protection and Joint Bonding

All ferrous metal pipes and all pipes specified or shown on the plans to be cathodically protected shall be completed in accordance with Section 13110: Corrosion Protection and Joint Bonding.

19. Warning and Locator Tape

Warning and locator tape shall be installed on all recycled water pipelines. The pipe identification shall be in accordance with Section 15151, Domestic and Recycled Water Facilities Identification.

20. Disinfection

All potable water pipelines shall be disinfected in accordance with Section 15041, Chlorination of Domestic Water Mains and Services for Disinfection.

21. Testing

All piping shall be hydrostatically pressure tested in accordance with Section 15042, Hydrostatic Testing of Pressure Pipelines.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15089**

# COMBINATION AIR VACUUM / AIR-RELEASE VALVE ASSEMBLY

## PART 1 - GENERAL

A. Description

This section includes materials and installation of combination air vacuum/air-release valves.

Valves are to be provided and installed per AWWA C 512, unless noted otherwise in this section.

B. Application

1. Combination valves shall be installed at high points on the line or as shown on the plans.

2. If the profile changes during construction from that shown on the drawings, valve assemblies shall be installed at the high points in lines as constructed.

3. The installation shall be complete as shown on MCWD Standard Plan W-14.

4. Combination valve assemblies shall function to slowly release pockets of air which accumulate at high points, or changes in line gradient, exhaust large quantities of air from pipeline while being filled and admit large quantities of air into pipeline when being drained to prevent air lock or vacuum collapse of the pipe.

C. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Concrete: | 03300 |
| 2. | Painting and Coating: (item C-3.C.) | 09900 |
| 3. | Hydrostatic Testing of Pressure Pipelines: | 15042 |
| 4. | Copper, Brass and Bronze Pipe, Fittings and Appurtenances: | 15057 |
| 5. | Manual Valves: | 15100 |

D. Approved Manufacturers

1. APCO
2. Val-Matic
3. Crispin

## PART 2 - MATERIALS

A. Combination Air Release Valves

1. Materials of construction for combination air and vacuum release valves shall be as described below:

| Item | Material | Specification |
|---|---|---|
| Body and Cover | Cast Iron | ASTM A126, Class B |
| Float, Lever Poppet | Stainless Steel | ANSI Type 316 (ASTM A240 or A276) |
| Seat | Rubber | Buna-N (Chlorine Resistant) |
| Drain Plug | Bronze | 85,5,5,5 Alloy |
| Casing bolts/nuts | Stainless Steel | ANSI Type 316 |

2. Interior of valve shall be epoxy lined per Section 09900 item C-3.C. Internal lining for domestic water facilities shall be NSF 61 approved epoxy to a minimum thickness of 12 mils (DFT) and Holiday tested.

3. All valves 2-inch and smaller shall have threaded inlets. All valves 3-inch and larger shall have flanged inlets.

4. For valves 4-inch and smaller, both air-vacuum and air-release functions shall be contained in one valve body. On valves 6-inch and larger, separate valves for each function piped together to function as one unit is permitted. An isolation valve shall be installed between the two units.

B. Fiberglass Air Release Valve Enclosure

The fiberglass enclosure shall be used as specified by the Engineer.

C. Service Piping

Water service piping utilized in the installation of the combination air and vacuum relief valve shall be Type K copper with bronze accessories per Section 15057.

D. PVC Pipe Sleeve

PVC pipe fittings, Schedule 80.

## PART 3 - EXECUTION

A. Location

1. Combination air-vacuum/air-release valves shall be installed at each point in the pipeline as shown on the drawings or as specified by the District representative.

2. The tap for the air valves shall be made in a level section of pipe no closer than 18 inches to a bell, coupling, joint, or fitting. No tap shall be permitted in any machined section of ACP.

3. The center of the PVC sleeve shall be, except as otherwise approved by the District representative, located as shown on MCWD Standard Plan W-14 as described below:

   a. Where concrete curb or asphalt concrete (A.C.) berm exists or is to be constructed, and the sidewalk is next to the property line; 40 inches back of the face of the curb.

   b. Where 6-foot wide or narrower sidewalk is to be installed or exist next to the curb; 12 inches back of sidewalk edge. Where there is insufficient public right-of-way behind of the sidewalk, an easement will be required.

   c. Where there is no curb or berm, the location shall be designated by the District.

B. Installation

1. Combination valves shall be installed in accordance with MCWD Standard Plan W-14.

2. The tap and piping shall be installed per Section 15057.

3. The concrete pad and support shall be constructed per Section 03300. Riser piping shall extend through concrete slab within a 4-inch diameter PVC sleeve.

4. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

5. The combination valve and the steel vented pipe cover shall be painted in accordance with Section 09900. The final coat of paint shall be applied immediately prior to the final inspection.

6. A bronze ball valve with handle shall be installed on the copper service line above the concrete slab.

7. Stainless steel nipple shall be installed between the shutoff valve and the air release valve.

C. Valve Pressure Testing

1. Test valves at the same time that the connecting pipelines are pressure tested. See Section 15042 for pressure testing requirements.

2. Protect or isolate any parts whose pressure rating is less than the test pressure.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15100**

# MANUAL VALVES

## PART 1 - GENERAL

A. Description

This section includes materials, testing, and installation of manually operated valves.

Manual valves to be supplied and installed per AWWA C 507, and C 509, unless noted otherwise below.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Concrete: | 03300 |
| 3. | Painting and Coating: | 09900 |
| 4. | Hydrostatic Testing of Pressure Pipelines: | 15042 |
| 5. | Ductile-Iron Pipe and Fittings: | 15056 |
| 6. | Domestic and Recycled Water Facilities Identification. | 15151 |

C. Approved Manufacturers

1. Gate Valves - Aboveground Smaller Than 2 Inch
   Red & White
   Milwaukee

2. Ball Valves Smaller than 3-inch
   Nibco

3. Resilient - Seated Gate Valves: 4 Inch through 12 Inch
   Clow
   Mueller
   AFC

4. Butterfly Valves
   Henry Pratt Company
   Dezurik
   AFC

5. Valve Boxes
   Christy G5 with cast iron cover

D. Reference Standards

Valves shall conform, as applicable, with the latest editions of the following codes and standards.

| | |
|---|---|
| AWWA C504 | Rubber-Seated Butterfly Valves |
| AWWA C509 & C515 | Resilient Seated Gate Valves |
| ASTM B62 | Composition Brass or Ounce Metal Castings |
| | Ductile Iron Castings for Valves |
| | Ductile Iron Pipe Flanges |
| ASTM D 429 | Tests for Rubber Property – Adhesion to Rigid Substrates |

E. Flanged End

All valves connecting to mains shall be flanged on at least one side and bolted to the fitting on the main.

F. Single Type of Valve

The developer shall choose an approved valve and then use only that valve throughout the development.

G. Detector Check and Backflow Prevention Assembly

Isolation valves on a detector check or backflow prevention assembly are to be part of an integral unit, furnished and assembled by the manufacturer of the device.

H. Butterfly Valves

Butterfly valves shall only be used on lines 14 inches and larger or as specifically shown on the plans.

I. Resilient Wedge Gate Valves

Resilient gate wedge valves shall be used on all pressure class 150 lines 4 inch through 12 inch.

J. Field Hydrostatic Test

All valves 16-inch and larger shall be field hydrostatically tested to the valves working pressure in the presence of the District inspector. Each side of the valve shall be tested independently.

## PART 2 - MATERIALS

A. General

1. Product data shall be shop drawings, manufacturer's product data and installation instructions demonstrating that the proposed valve is in compliance with the reference standards as well as the intended service. If drawings are returned disapproved or not stamped, they shall be revised or corrected as necessary and resubmitted for review, acceptance, and stamping.

2. Certified test reports shall be provided with each delivery that the valve(s) delivered complies with this specification.

3. Valves shall be installed complete with operating handwheels or levers, extension stems, worm gear operators, operating nuts, and wrenches required for operation.

4. Valves shall have the name of the manufacturer and the size of the valve cast or molded onto the valve body or bonnet or shown on a permanently attached plate.

5. Valve body and trim casting shall be of domestic origin.

6. Bolts for all valves shall be 316 stainless steel. Bolts consisting of 304 stainless steel shall not be permitted.

7. Suitable valves shall be provided to connect to adjoining piping as specified for pipe joints.

B. Valve Operators

1. Provide lever or wrench operators having adjustable, "position indicator" for exposed butterfly valves smaller than 6 inches and hand-wheels for above ground gate valves.

2. Provide 2-inch AWWA operating nuts for buried and submerged valves.

3. Provide gear operators on butterfly valves 6 inches and larger. Gear operators for valves 8 inches and larger shall be of the traveling nut type. For large valves, worm gears shall be used with the approval by the Engineer.

4. Gear operators shall be enclosed with seals provided on shafts to prevent entry of dirt and water into the operator. Gear operators for valves located above ground or in vaults and structures shall have handwheels. Minimum handwheel diameter shall be 12 inches. The operator shall contain a dial indicating the position of the valve disc or plug. Gear operators for buried or submerged valves shall have 2-inch square AWWA operating nuts.

5. For buried or submerged service, provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed operators designed for buried or submerged service.

6. Traveling nut and worm gear operators shall be of the totally enclosed design so proportioned as to permit operation of the valve under full operating head with a maximum pull of 80 pounds on the hand-wheel. Provide stop limiting devices in the operators in the open and closed positions. Operators shall be of the self-locking type to prevent the disc or plug from creeping. Design operator components between the input and the stop-limiting devices to withstand without damage a pull of 200 pounds for handwheel or chainwheel

operators and an input torque of 300 foot-pounds for operating nuts when operating against the stops.

7. Operators on buried valves shall produce the required torque on the operating nut with a maximum input of 150 foot-pounds.

8. Valve operators, handwheels, or levers shall open by turning counterclockwise.

C. Painting and Coating

1. Coat metal valves (except bronze and stainless-steel valves) located above ground or in vaults and structures in accordance with Section 09900. Apply the specified prime coat at the place of manufacture. Apply finish coat in field. Finish coat shall match the color of the adjacent piping. Coat handwheels the same as the valves.

2. Coat buried metal valves at the place of manufacture per Section 09900.

3. Valves 4 inches and larger shall be coated on their interior metal surfaces excluding seating areas and bronze and stainless steel pieces in accordance with AWWA C550 and these specifications. Sandblast surfaces in accordance with SSPC SP-5. Remove all protuberances which may produce pinholes in the lining. Round all sharp edges to be coated. Remove any contaminants which may prevent bonding of the lining. Coat the interior ferrous surfaces using one of the following methods:

   a. Apply powdered thermosetting epoxy (3M Scotchkote 6251 Fusion Bonded Epoxy or equal) per the manufacturer's application recommendations to a thickness of 7 to 9 mils. All gaskets and seals must be removed prior to applying coating.

   b. Apply two coats of catalytically setting epoxy (Tnemec Series N140, or equal) to a dry-film thickness of 7 to 9 mils total. Follow the paint manufacturer's application recommendations including minimum and maximum drying time between the required coats.

   All valve coatings shall be factory applied or by the manufacturer’s qualified distributor. Touch up and repair of valve coatings shall be only done by authorized factory distributors.

D. Valves

Aboveground Ball Valves 2 Inches and Smaller

1. Aboveground threaded end ball valves, 1/4 inch through 3 inches, for water service shall be full bore port ball type having a minimum working pressure of 200 psi WOG. Valves shall have plastic coated lever operators.

2. Materials of construction shall be as described below:

| Component | Material | Specification |
|---|---|---|
| Body | Bronze | ASTM B 62 |
| Ball | Stainless Steel | ASTM B 62 |
| Seat, Seals | Teflon | |

| | | |
|---|---|---|
| Stem | Bronze or Copper silicon | ASTM b 62, B 99<br>(Alloy 651), B 584<br>B 371 (Alloy 694) |

3. Stem material shall have a minimum tensile strength of 60,000 psi and a minimum yield strength of 30,000 psi.

Resilient-Seated Wedge Gate Valves

1. Valves shall conform to AWWA C509 and C515 and the requirements listed herein.

2. All valves shall be bubble tight at 200 psi working pressure.

3. Valves shall have non-rising low zinc stems, opening by turning left and provided with 2-inch-square operating nut. Outside stem and yolk valves shall be used on backflow device shutoff valves.

4. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.

5. Stuffing boxes shall by O-ring seal type with two rings located in stem.

6. Low friction torque reduction thrust bearings shall be located both above and below the stem collar.

7. Materials shall be as described below:

| Component | Material | Specification |
|---|---|---|
| Body, Operating Nut<br>Bonnet, Seal Plate | Cast Iron of<br>Ductile Iron | ASTM A 126<br>Class B |
| Gate | Cast Iron<br>Ductile Iron | Type 316 |
| Bonnet and Seal<br>Bolts | Stainless Steel | Type 316 |
| O-Rings | Synthetic Rubber | ASTM D2000 |

8. All internal working parts (excluding gate) shall be all bronze containing not more than 2 percent aluminum or more than 7 percent zinc. Valve stems shall be cast or forged from bronze having a tensile strength of not less than 60,000 psi, a yield point of not less than 30,000 psi, and an elongation of not less than 10 percent in 2 inches.

9. All gates shall be encapsulated in Buna-N rubber or a nitrile elastomer.

Tapping Valves

1. Tapping valves shall conform with all requirements for gate valves 2 inches and larger and the additional requirements listed herein.

2. All valve ends shall be flanged. The flange on one end shall have slotted bolt holes to fit all standard tapping machines.

3. Seat rings shall be oversized to permit the use of full-size cutters.

4. Resilient wedge valves may be used as tapping valves, provided that the disk fully retracts to produce a full port opening.

Butterfly Valves

1. Butterfly valves shall be short body, conforming to AWWA C504, Class 150. Minimum working differential pressure across the valve disc shall be 150 psi unless specified otherwise on the drawing.

2. Butterfly valves shall be furnished and installed with the type of ends as shown on the plans and as herein specified. Wafer style valves will not be permitted.

3. Each valve body shall be tested under a test pressure equal to twice its design water working pressure.

4. Valves shall be bubble tight at rated pressures and shall be satisfactory for throttling service and frequent operation after long periods of inactivity. Valve discs shall rotate 90 degrees from the full-open position to the tight-shut position.

5. Valve ends shall be as shown on the drawings; flanged ends shall be Class 125, ANSI B16.1.

6. Valve shafts shall be Type 316 stainless steel or carbon steel with Type 316 stainless-steel journals and static seals. Valve shafts shall be dual stub shafts or a one-piece shaft extending completely through the valve disc.

7. Materials of construction shall be as described below:

| Component | Material | Specification |
|---|---|---|
| Body | Cast Iron or<br>Ductile Iron | |
| Exposed Body<br>Capscrews, and<br>Bolts and Nuts | Stainless Steel | Type 316 |
| Discs | Cast Iron<br>Ductile Iron, or<br>Ni-Resist | |
| | | |
| Seat | Buna-N (in body) | |

8. The rubber seat shall be an integral part of the valve body. Rubber seats fastened to the disc by any means shall not be permitted.

B. Bolts and Nuts for Flanged Valves

Bolts and nuts for flanged valves shall be Type 316 stainless steel in accordance with Section 15056.

C. Gaskets

Gaskets for flanged end valves shall be as described in Section 15056.

D. Valve Boxes for Buried Valves

1. Valve extension pipe material shall be 8-inch PVC SDR 35 pipe.

2. Design cast iron cap to rest within a frame on a cast-in-place concrete ring surrounding the valve extension pipe; size the tapered skirt of the cap for a close fit inside the upper sleeve portion of the valve box. Caps for the domestic water system shall be circular with the word "WATER" cast on the cap. Caps for the recycled water system shall be circular with “recycled” cast on the cap. Coat the cap and frame with asphalt or coat-tar paint.

E. Extension Stems for Buried Valve Operators

1. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 24 to 30-inches below the surface of the ground and/or box cover.

2. Extension stems shall be steel and shall be complete with 2-inch-square operating nut.

3. Valve stem extensions shall be of a solid design (no pinned couplings permitted) with guides.

4. Valve extensions shall conform with MCWD Standard Plan W-11.

**PART 3 - EXECUTION**

A. Joints

1. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

2. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound to Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

3. Rubber ring grooves of valves shall be inspected before installation by the contractor for ridges or holes that would interfere with the rubber ring. Interferences with the rubber ring shall be corrected to a satisfactory connection or the valves replaced, as required by the District. (All valves shall have the same rubber-ring groove profile as the groove of the pipe couplings furnished with the pipe.)

B. Butterfly Valve Operators

Butterfly valves shall be installed with the operators on the street centerline side of the pipeline.

C. Exterior Protection

1. All exposed flanges and other metal surfaces and all damaged coatings shall be coated after assembly with bituminous mastic per Section 09900. Coating of stainless steel flange bolts is not required.

2. Wrap buried valves with 8-mil polyethylene wrap per AWWA C105.

D. Concrete Supports

1. Valves shall be anchored in concrete as shown in MCWD Standard Plan W-10.

2. Concrete supports will not be required under valves bolted to flanged fittings.
3. Until supports are poured, valves shall be temporarily supported by placing wooden skids underneath the valve so that the pipe is not subjected to the weight of the valve.

4. All concrete anchors and thrust blocks specified or required by the District representative are considered as part of the pipeline installation.

E. Valve Boxes

1. Valve boxes shall be firmly supported and shall be kept centered and plumb over the operating nut of the valve.

2. Beveled sections of pipe will not be allowed at the top of the valve extension pipe. The top cut shall be square and machine made.

3. During the construction of new tracts, the valve extension pipes for "key valves" shall extend well above the ground level to permit ease of location in case of emergency shutoffs.

4. The box cover shall be flush with the surface of the finished pavement or at any other level designated by the District representative.

F. Backfill

1. All backfill within 24 inches of a valve shall be clean, washed sand.

2. Backfill is to be placed and compacted in accordance with Section 02223.

G. Valve Leakage Testing

1. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15042 for pressure testing requirements.

2. Valves shall have a pressure rating higher than or equal to the test pressure.

H. Valve Location

The location of all valves shall be marked with a 2-inch "V" chiseled in the curb face perpendicular to the valve. The offset distance, in feet, from the curb face to the valve shall be chiseled next to the "V". Where a perpendicular offset is not possible, multiple tangential offsets will be required to allow triangulation of the valve location.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15112**

# BACKFLOW PREVENTERS

## PART 1 - GENERAL

A. Description

This section includes materials, installation, and testing of backflow prevention assemblies.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Concrete: | 03300 |
| 2. | Ductile-Iron Pipe and Fittings: | 15056 |
| 3. | Copper, Brass, and Bronze pipe, Fittings, and Appurtenances: | 15057 |
| 4. | Manual Valves: | 15100 |
| 5. | Meters: | 15150 |

C. Approved Assemblies

The backflow prevention assembly shall be included in the latest edition of the "List of Approved Backflow Prevention Assemblies," Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, School of Engineering.

D. Application

1. A backflow prevention device shall be installed at all locations where the potential for a backflow condition into the District's domestic water mains exists. The device shall be located immediately behind the meter assembly.

2. The type of device required will depend on the level of potential hazard which exists. The District’s Cross-Connection Program Specialist, will make the final determination of, and what type of backflow device is required.

3. Any service providing domestic water to anything other than a private residential dwelling shall have backflow protection.

4. A double check detector check assembly is required on a private on-site fire protection system or a private on-site distribution system with two or more separate connections to the District's domestic water mains.

E. Responsibility

The District will maintain only the upstream mainline shut-off valve and service to the point of connection of the assembly and the by-pass meter. The owner is responsible for the testing, maintenance and repair or replacement of the device.

## PART 2 - MATERIALS

A. Shut-Off Valves

1. The shut-off valves for assemblies 3-inch and larger shall be resilient seat gate valves conforming to Section 15100. Ball valves shall be used on assemblies smaller than 3-inch.

2. Shut-off valves shall have outside stems and yokes.

B. Ductile Iron Piping and Fittings

Ductile iron piping and fittings shall be furnished and installed in accordance with Section 15056.

C. Concrete

Concrete thrust blocks and supports shall be in conformance with Section 03300.

D. By-Pass Piping

By-pass piping shall be copper or brass conforming with Section 15057.

E. Backflow Prevention Assembly

All backflow prevention assemblies shall conform to the latest edition of AWWA C506 and the "Manual of Cross-Connection Control," Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, School of Engineering.

F. By-Pass Meter

The by-pass meter shall conform with the requirements of Section 15150 and shall be compatible with the backflow device on which it is installed. The backflow prevention assembly and the by-pass meter shall be furnished as one complete unit. All by-pass meters shall be 5/8-inch by 3/4-inch, manufactured by Master Meters, with registers reading in cubic feet.

## PART 3 - EXECUTION

A. Installation

Installation of the double detector check assembly, or a reduced pressure principle assembly will be per MCWD Standard Plan W-7 and as noted below.

1. Installation shall comply with the latest plumbing codes and applicable local agency requirements.

2. Installation shall comply with the requirements of the latest edition of the Manual of Cross-Connection Control.

B. Testing

Upon completion of the installation of the device, a test shall be performed and a certificate of the adequacy and operational compliance shall be furnished to the District. The tests shall be performed by a testing agency approved by the AWWA California-Nevada Section and CDHS.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15139**

# FIRE HYDRANTS

## PART 1 - GENERAL

A. Description

This section includes the materials, installation and testing of fire hydrants.

Hydrants shall be supplied and installed per MCWD Standard Plan W-8, AWWA C 503 and as described herein.

B. Related Work Described Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Trenching, Backfilling, and Compacting: | 02223 |
| 2. | Concrete: | 03300 |
| 3. | Painting and Coating: | 09900 |
| 4. | Hydrostatic Testing of Pressure Pipelines: | 15042 |
| 5. | Ductile Iron Pipe and Fittings: | 15056 |
| 6. | Manual Valves: | 15100 |

C. Approved Wet Barrel Hydrants

1. Residential Use
   Clow 2060
   James Jones 3760 (Hydrant Head and Fluted Spool)

2. Commercial and Industrial Use
   Clow 2065
   James Jones 3770 (Hydrant Head and Fluted Spool)

## PART 2 - MATERIALS

A. Wet Barrel Hydrant

1. Hydrant Top Section

a. Fire hydrants shall have individual valves for each outlet opening counter clockwise. Fire hydrants for residential use shall have two 2-1/2 inch hose nozzle and one 4-1/2-inch pumper nozzle. Fire hydrants for commercial or industrial developments shall have one 2-1/2 inch hose nozzle and two (2) 4-1/2-inch pumper nozzles.

b. All outlets shall have National Standard Hose Threads.

c. The hydrant top section shall be manufactured of bronze conforming to ASTM B 62.

d. All interior working parts, including stems, shall be of bronze containing no more than 7% zinc or 2% aluminum.

e. Hydrants are to be provided with:

1-1/8-inch sized pentagon-shaped operating nut, and
1-1/8-inch capnuts.

f. All fire hydrants shall have the name of the manufacturer cast onto the hydrant body or shown on a permanently attached plate.

g. Plastic outlet nozzle caps shall be provided for all outlets. Caps shall be securely chained to the barrel with non-kinking metal chain in a manner to permit free rotation of the cap.

h. All hydrant flanges shall be eight-hole regular, Class 125, American Standard cast iron flange drilling.

2. Bury Section

a. The bury section shall be 6-inch cast iron long radius bury elbow and shall be cement lined in conformance with Section 15056. Bury inlet shall be 6-inch rubber-ring hub bell connection for C900 PVC pressure pipe.

b. A flanged ductile iron spool shall be installed to position the hydrant flange 4 inches above the concrete pad (finish grade).

c. All wet-barrel fire hydrant cast-iron buries are to be cement lined.

d. When using a riser spool, bolts shall be stainless steel 316, standard non break-away.

e. Bury section outlet and riser spool flanges shall be eight-hole regular, Class 125, American Standard cast-iron flange drilling.

C. Break-Away Bolts

1. Break-away bolts shall be used to join the spool section to the hydrant top section.

2. All bolts, and nuts, shall be stainless steel 316.

D. Valve

The shut-off valve shall be a resilient-seated gate valve per Section 15100, including the valve box. Butterfly valves will not be permitted on fire hydrant laterals.

E. Ductile Iron Pipe

Ductile iron pipe shall be per Section 15056.

F. Ductile Iron Pipe and Fittings

Ductile-iron Pipe and fittings shall be in accordance with Section 15056.

G. Concrete

Concrete pads and supports shall be Class B concrete conforming with Section 03300.

H. Gaskets

Gaskets shall be of rubber composition per Section 15056.

**PART 3 - EXECUTION**

A. General

1. Fire hydrant assemblies shall be installed in accordance with the standard drawing and as specified herein, and shall include the connection to the main, the fire hydrant, hydrant bury, shutoff valve, valve well and valve box, connection piping, concrete thrust blocks, and appurtenances.

2. Refer to MCWD Standard Plan W-8.

B. Location

Fire hydrant assemblies shall be located as shown on the plans or as approved by the District representative. The center of the fire hydrant shall be, except as otherwise approved by the District representative, located as described below:

1. Where concrete curb or asphalt concrete (A.C.) berm exists or is to be constructed, and the sidewalk is next to the property line; 1 feet 6 inches back of the back edge of the curb.

2. Where 6-foot-wide or narrower sidewalk is to be installed or exists next to the curb; 12 inches back of sidewalk edge. Where there is insufficient public right-of-way behind the sidewalk, an easement will be required. For sidewalks wider than 6 feet; 18 inches back of the curb face.

3. Where there is no curb or berm, the location shall be designated by the District representative.

4. The flange elevation at the base of the hydrant shall be set 4-inches above the curb or sidewalk, or the surrounding graded area, or as approved by the District representative. Spools additional will not be permitted when correcting the flange elevation.

C. Trenching, Backfilling, and Compacting

1. All trenching, backfilling, compaction and other excavation shall be in accordance with Section 02223.

2. All backfill within 24 inches of a valve shall be imported sand.

D. Valve and Valve Box

The valve and valve box shall be installed in accordance with Section 15100.

E. Ductile Iron Pipe

Ductile iron pipe shall be installed in conformance with Section 15056.

F. Break-Away Bolts

Break-away bolts shall be installed with the threads away from the top of the hydrant.

G. Concrete

The concrete pad shall be Class B concrete and thrust blocker shall be Class A concrete and shall be placed per Section 03300.

H. Painting

All public fire hydrants shall be painted with one prime coat and two finish coats of yellow paint at the place of manufacture. Before the fire hydrant has been installed in accordance with Section 09900. A final touch-up coat shall be applied just prior to the final inspection.

I. Testing

Test hydrants at the same time that the connecting pipeline is pressure tested. See Section 15042 for pressure testing requirements.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15150**

# METERS

## PART 1 - GENERAL

A. Description

This section describes the purchase, materials, installation and testing of meter assemblies.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Structure Excavation: | 02200 |
| 2. | Concrete: | 03300 |
| 3. | Precast Concrete Vaults: | 03462 |
| 4. | Painting and Coating: | 09900 |
| 5. | Ductile-Iron Pipe and Fittings: | 15056 |
| 6. | Copper, Brass, and Bronze Pipe, Fittings, and Appurtenances: | 15057 |
| 7. | Manual Valves: | 15100 |
| 8. | Flexible Pipe Couplings and Expansion Joints | 15162 |

C. Approved Manufacturers

1. Displacement Type – 3/4 inch through 2-inch
   Master Meter

2. Turbine Meters
   Master Meter

3. Compound Meters
   Master Meter

4. Propeller Meters
   Master Meter

5. Fire Service Meter Assembly
   Master Meter
   Badger

6. V-Cone Flow Meters
   McCrometer V-cone flow meter

7. Meter Boxes
   Christy
   Armorcast
   BES

D. Residential Meters

1. The District shall furnish and install the meters. The fee to furnish and install the meter will be established by the District per the Water Code or the Construction and Transfer of Ownership Agreement.

2. The developer shall expose and set to grade all coppersetters prior to requesting meters.

3. The developer is responsible for the installation of the meter box, coppersetters, meter (as required by the District) and customer service valve.

4. Prior to occupancy, the District will, upon finding the installation to be acceptable, record all meter account information and padlock the curb stop in the off position. The developer will subsequently be relieved of any additional responsibility for consumption or service charges for this service.

5. Subsequent applications for permanent service shall be made in accordance with the District's Rules and Regulations.

E. By-Pass Line

1. A by-pass line shall be installed on all meter assemblies 3-inch and larger. A by-pass line is not required on irrigation services, or as determined by the District.

2. A lockable valve shall be installed in all by-pass lines.

3. A by-pass line may be required on smaller installations which require continuous service.

**PART 2 - MATERIALS**

A. General

1. All meters shall be new and of current manufacture design.

2. All parts of the meters of the same size and model shall be interchangeable.

B. Registers

1. The registers on all meters shall have straight reading dials with full sweep test circles.

2. All registers are to be calibrated to read in cubic feet.

3. All registers are to be direct read. This may require the stamping of a zero or zeros on the register dial face. The last two digits including the zero or zeros stamped on the register dial face shall be easily distinguishable from the balance of the digits either by contract of white numbers on black or red numbers on white.

4. Registers for positive displacement, compound, and turbine meters are to be hermetically roll sealed.

5. Register gears shall be self-lubricating molded plastic unless stated otherwise. Register gears for propeller meters may be bronze.

6. Registers for positive displacement and turbine meters shall not have replaceable change gears.

7. Registers shall be driven by a magnetic coupling.

8. All register lenses shall be tempered glass.

9. All registers shall be provided with low flow detectors.

10. All registers shall be oriented to read from the inlet side of the meter.

11. The register must be attached to the meter case by a bayonet attachment. The register assembly shall be able to mount any of four positions. On positive displacement meters the standard mount position shall read from the meter inlet side.

C. Remote Reading Device

1. Meter shall be equipped with touch-read registers manufactured by Master Meter when designated by the District representative.

2. All meters 3-inch and larger and double check detector check meters shall be supplied with a remote read meter transceiver unit (MXU). The MXU is to be delivered to the District Plan Check Engineer.

D. Stainless Steel Hardware

All bolts, nuts, capscrews, studs, and washers shall be Type 316 stainless steel ASTM A 193 B8M for bolts, and ASTM A 194 8M for nuts.

E. Displacement Type Meters (3/4 inch through 2 inch)

1. Meters shall conform to the material and performance requirements of AWWA C700, as most recently revised, and as specified herein.

2. The manufacturer shall furnish certified results for each meter showing that it has been tested for accuracy of registration and that it complies with accuracy and capacity requirements of AWWA C700 when tested in accordance with AWWA Manual M6.

3. All meters body components resisting pressure shall be bronze.

4. All register boxes and covers shall be synthetic polymer or bronze.

5. Casing bolts shall be stainless steel or bronze.
6. All internal hardware shall be stainless steel.

7. 3/4-inch through 1-inch meters shall have external straight threads. 1½-inch and 2-inch meters shall have flanges on ends.

8. The face-to-face length and maximum profile height of the meter shall be as described below:

| Meter Size (inches) | Face-to-Face Dimension (inches) | Maximum Profile Height Centerline Inlet to Register Cover (inches) |
|---|---|---|
| 3/4 | 7-1/2 | 3-1/4 |
| 3/4 | 9-1/2 | 3-1/4 |
| 1 | 10-3/4 | 3-1/4 |
| 1-1/2 | 13 | 4-1/4 |
| 2 | 17 | 5 |

9. All meters shall have plastic or stainless steel internal strainers.

10. All registers and register boxes shall be secured to the main casing by acceptable tamper-proof means. Safety wiring of standard bolts and screws is NOT considered an acceptable method of tamper-proofing.

11. The serial number of each meter shall be imprinted on the register box cover, and the main case.

12. Register shall be removable without reducing pressure or removing the main case from the installation.

13. All positive displacement meters shall be supplied with the following warranty, which shall not be prorated under any conditions:

    a. All meters shall be guaranteed to maintain new-meter accuracy (±1½%) for five years.

    b. All measuring chambers and disks or pistons shall be guaranteed against malfunction for fifteen years.

    c. All registers shall be guaranteed for twenty-five years.

F. Turbine Meters (1½-inch and larger)

1. All meters shall conform with AWWA C701 Class II and the requirements specified herein.

2. The manufacturer shall furnish certified test results for each meter showing that it has been tested for accuracy of registration and that it complies with accuracy and capacity requirements of AWWA C701 when tested in accordance with AWWA Manual M6.

3. Turbine meters shall have all bronze main cases.
4. Straightening vanes shall be provided in the main case of all meters.

5. A calibration adjusting vane located in the measuring chamber shall be provided on all meters.

6. All rotors shall be thermoplastic with graphite bearings (PTFE) rotating on a stainless steel or tungsten carbide shaft.

7. All motion shall be transmitted from the rotor to the register through a magnetic coupling.

8. All register boxes and covers shall be bronze.

9. All registers and register boxes shall be secured to the measuring chamber by acceptable tamper-proof means. Safety wiring of standard bolts and screws is NOT considered an acceptable method of tamper-proofing.

10. All turbine meters shall be equipped with strainers. The strainer body and cover shall be cast bronze for meters 2-inch through 6-inch. Ductile iron will be permitted only on 8-inch and larger or fire service strainers. All ductile iron strainers shall be epoxy lined in accordance with Section 09900. All strainers shall be furnished with bronze or stainless steel screens with an effective open area at least double the area of the meter. On metered fire service installations, a U.L. approved strainer with an effective open area at least 4 times the equivalent open area of the meter will be required.

11. All measuring chamber, strainer cover, and flange bolts shall be Type 316 stainless steel.

12. The serial number of each meter shall be imprinted on the register cover, and the main case.

13. All meter registers shall be provided with a remote touchread device.

G. Compound Meters (3-inch and larger)

1. All meters shall conform with AWWA C702 and the requirements specified herein.

2. The manufacturer shall furnish certified test results for each meter showing that it has been tested for accuracy of registration and that it complies with accuracy and capacity requirements of AWWA C702 when tested in accordance with AWWA Manual M6.

3. Compound meters shall have all bronze main cases.

4. All compound meters shall have flanged connections.

5. A test plug shall be provided in the outlet side of the main case of all meters.

6. The measuring chamber shall be capable of operating within the specified AWWA accuracy limits without recalibration when transferred from one main case to another.

7. A calibration adjusting vane located in the measuring chamber shall be provided on all meters.

8. All rotors shall be thermoplastic with graphite bearings rotating on a stainless steel shaft.

9. All motion shall be transmitted from the rotor to the register through a magnetic coupling. Worm gears will NOT be permitted.

10. All register boxes and covers shall be bronze, or synthetic polymer.

11. All registers and register boxes shall be secured to the measuring chamber by acceptable tamper-proof means. Safety wiring of standard bolts and screws is NOT considered an acceptable method of tamper-proofing.

12. All compound meters shall be equipped with strainers. The strainer body and cover shall be bronze for 2-inch through 6-inch meters. Ductile iron will be permitted only on 10-inch and larger or fire service strainers. All ductile iron strainers shall be epoxy lined in accordance with Section 09900. All strainers shall be furnished with bronze or stainless steel screens with an effective open area at least double the area of the meter.

13. All measuring chamber, strainer cover, and flange bolts shall be Type 316 stainless steel.

14. The serial number of each meter shall be imprinted on the register cover, and main case.

15. All meter registers shall be provided with remote touchread devices.

H. Fire Line Meter Assembly

1. A fire line meter assembly may be required for residential structures and commercial and industrial installations where separate fire service installations are not provided.

2. Fire line meter assemblies shall be furnished as complete units by the manufacturer. Each fire line meter assembly shall consist of a U.L. approved strainer with a stainless steel strainer basket, a turbine meter sized for fire flow, a positive displacement or turbine meter sized for maximum demand without fire flow, positive displacement meter piping, lockable ball valves to isolate the positive displacement meter, a check valve downstream of the positive displacement meter, and an internally weighted or spring loaded check valve adjusted to open prior to exceeding the maximum flow range of the positive displacement meter. The positive displacement meter piping shall extend from the outlet of the strainer to the downstream side of the swing check valve.

3. Each fire line meter assembly shall be constructed of components conforming to the appropriate sections of these specifications.

4. Cast iron or steel components shall be epoxy lined and coated per Section 09900.

5. Each fire line meter assembly shall conform the AWWA C703 and shall be U.L listed, and shall be F.M. approved for fire service use.

6. All meter registers shall be provided with remote touchread devices.

I. Propeller Meters

1. All propeller meters shall conform with AWWA C704 and the requirements specified herein.

2. The main casing may be steel or cast-iron and shall be epoxy lined and coated.
3. The main casing may be flanged or plain end as specified by the engineer.

4. Meter head shall be mounted on a flanged connection for easy removal of all interior parts from the pipe tee without disturbing the connections to the pipeline.

5. The drive mechanism shall be by means of stainless steel gears and shafting or flexible cable drives.

6. All meters shall be polyethylene propellers.

7. Bronze gearboxes on the propeller drive shafts are required.

8. Each meter tube shall be equipped with straightening vanes mounted immediately preceding the propeller.

J. Totalizer - Transmitter

1. The totalizer - transmitter shall be furnished with all necessary mounting hardware for operation from the meter.

2. The transmitter shall have integrally mounted electronic circuitry to convert to both a true 2-wire 4-20 Ma DC output linear to flow rate and a true 2-wire scaled pulse.

   a. The 4-20 Ma DC output shall operate from an external regulated 18-30 VDC power supply with load capacity of 575 ohms at 28 VDC. The accuracy of the 4-20 Ma output shall be better than +/- 0/5% of scale.

   b. The pulse output shall operate from an external regulated 10-30 VDC power supply which can be either the 4-20 Ma DC power supply or a separate power supply. The pulse circuit voltage drop across the transmitter shall be 3 VDC or less. Each pulse shall represent the volume of the least significant totalizer digit.

K. Precast Vaults

Precast meter vaults and boxes shall conform with Section 03462 and the standard drawings.

L. Copper, Brass, and Bronze Pipe, Fittings, and Appurtenances

All service connection and by-pass piping shall conform with Section 15057.

M. Ductile-Iron Pipe and Fittings

All piping for meter assemblies 3-inch and larger shall conform with Section 15056.

N. Manual Valves

1. All valves shall conform with Section 15100.

2. All valves on by-pass lines shall be lockable in the closed position. On 3-inch and larger by-pass lines, resilient seat gate valves with hand wheels and a chain and lock are permitted.

O. V-Cone Meter

1. Meter:

The meter shall be a V-cone differential pressure producing flow meter. It shall have a primary flow element of constant area installed in the pipe the meter measures. The primary element, and support members shall be constructed of 316 stainless steel, and shall be epoxy coated. The primary elements with rotating or moving parts in the flow stream are not acceptable.

The meter shall have an accuracy of 0.5% of the actual flow within the designated flow range. The meter shall not require more that a total of seven (7) pipe diameters of straight run included in the length of the meter.

The meter tube shall be constructed of carbon steel, schedule 40 pipe, with ANSI 150-pound flanges. The tube shall be epoxy lined and coated with 15 mils of Keysite 740.

The support member shall be capable of maintaining the cone's orientation in flows up to 20 foot per second. The upstream pressure taps shall be 1/2 inch female NPT, and downstream pressure taps shall sense pressure at the centerline of the flow stream.

2. Flow Transmitters:

Flow transmitters shall have diaphragms and drain valves made of 316 stainless steel, with bolts and flanges of Cadmium Plated Carbon Steel, housed in NEMA 4 enclosures. The fill fluid shall be silicone oil.

The accuracy shall be within 0.25% of calibrated span for a range of 20% to 100% of flow including the combined effects of linearity, hysteresis and repeatability.

The flow transmitter shall have a range as specified by the district and shall provide a 4-20 MA DC output with adjustable damping proportional to flow rate.

The flow transmitters shall be Rosemount Smart family Model 1151. Transmitter shall be supplied with 3-valve manifolds No. 01151-150-0001. Transmitter shall be adjusted and calibrated by the meter manufacturer.

V-cone meter and transmitter shall be supplied as a unit. The unit shall be factory tested and calibrated. Certified test results shall be furnished with each assembly.

P. Meter Boxes

1. Precast concrete meter boxes for copper setters, 2-inch and smaller shall be purchased and installed by the contractor unless noted otherwise. Meter box lid shall be polymer type.

2. Sizes shall be as specified on the standard drawings for the various sizes and types of services.

Q. Meter Box Covers

1. All meter box covers shall be furnished with rectangular reading lids.

2. Concrete meter box covers shall be installed in all locations.

**PART 3 - EXECUTION**

A. Meter Installations

1. All residential meters shall be installed by the contractor per MCWD Standard Plans W-1, W-2, W-3, or W-4.

2. All 3-inch and larger meter installations shall conform with MCWD Standard Plans W-24 or W-25.

B. Excavation and Backfill

Excavation and backfill for the meter installation shall be in accordance with Section 02200.

C. Service Piping

1. All piping for service lines and by-pass lines up to 2-inch shall be installed in conformance with Section 15057.

2. The piping for all service installations 3-inch and larger shall be in accordance with Section 15056 and the applicable standard drawing.

D. Test Tap

On services 3 inches and larger, a 2-inch service saddle or welded coupling and corporation stop shall be installed on the spool downstream of the meter. The tap shall be located a minimum of three (3) pipe diameters downstream of the meter. On propeller meter installations, the location of the test tap will be determined by the District representative.

E. Meter Vault

All precast concrete meter vaults shall be installed in accordance with Section 03462 and the MCWD Standard Plans W-1 through W-4, W-24, and W-25.

F. Concrete Work

All thrust blocks, foundations, and supports shall be of the sizes shown in the applicable standard drawings and conform with Section 03300.

G. Valves

All valves installed shall conform with the Section 15100.

H. Painting and Coating

1. All exposed and buried piping shall be painted or coated in accordance with Section 09900.

2. The meter reading lids on all recycled water services shall be painted in accordance with Section 09900.

I. Testing

1. All meter services shall be hydrostatically pressure tested during the testing of pipeline in accordance with Section 15042.

J. Meter Boxes

1. Boxes shall be set true to line and to the grade of the top of the curb, sidewalk, or surrounding graded area.

2. Meter boxes are not to be set until fine grading for landscape grading has been completed by the developer.

3. Retaining walls may be required around meter boxes installed on slopes as determined by the District representative.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15151**

**DOMESTIC AND RECYCLED WATER FACILITIES IDENTIFICATION**

## PART 1 - GENERAL

A. Description

All domestic water systems and appurtenances shall be identified as herein described. All recycled water systems shall be identifies as described in the "Rules and Regulations for Users of Reclaimed Water," unless the issue is not covered. In which case recycled water systems and appurtenances shall be identified and herein described.

This section describes special identification, markings, materials and their installation procedures for potable and off-site recycled water facilities.

All water systems and appurtenances must be marked as described herein to avoid confusion with other utilities and between each other.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

| | | |
|---|---|---|
| 1. | Painting and Coating: | 09900 |
| 2. | Ductile Iron Pipe & Fittings: | 15056 |
| 3. | PVC Pressure Distribution Pipe: | 15064 |
| 4. | Combination Air and Vacuum Release Valves: | 15089 |
| 5. | Manual Valves: | 15100 |
| 6. | Fire Hydrants: | 15139 |
| 7. | Water Meters: | 15150 |

C. Approved Manufacturers

1. Warning Tape and Pipe Sleeves

a. Griffolyn Company, Inc.
10020 Mykawa Road
P.O. Box 33248
Houston, TX 77033
Phone: (713) 943-0070 or (800) 231-6074

b. Terra Tape, Division of Reef Industries
P. O. Box 33310
Houston, TX 77233
Phone: (800) 231-2417

c. T. Christy Enterprises, Inc.
655 E. Ball Road
Anaheim, CA 92805
Phone: (714) 507-3300

2. Warning Labels and Signs

In all cases the warning labels or signs must be approved prior to installation. Failure to receive prior approval may result in the owner, applicant, or customer removing such sign(s) and providing approved replacement(s). All costs will be at the applicant's, owner's or customer's expense. Failure to comply with these requirements as set forth herein will result in termination of service as provided for in the District's Rules and Regulations, Sections 600.

3. Witness Markers

Carsonite Water line Markers
Carsonite International
1301 Hot Springs Road
Carson City, NV 89706
Phone (800) 648-7974

D. Identification

1. The use of stenciled pipe will be accepted as an alternative to the use of warning tape.

2. DIP carrying recycled water shall be encased within a purple 8-mil polyethylene sleeve with the words "RECYCLED WATER" stenciled with 2-inch black letters.

3. PVC or DIP carrying domestic water, and located in the vicinity of recycled water piping, shall have the words "DOMESTIC WATER" stenciled with 2-inch blue letters. Lettering shall be on both sides of the pipe in at least three places in an 18-foot section of pipe (total six places per section of pipe).

4. PVC pipe carrying recycled water shall be purple in color with black letters. The stenciling shall appear on both sides of the pipe with the marking "RECYCLED WATER" in 5/8-inch letters repeated every 12 inches.

5. All service lines shall be encased within a color-coded 8-mil polyethylene sleeve. Sleeve shall be blue in color for all domestic water services and purple in color for all recycled water services.

E. Valve Boxes

1. All valve boxes for recycled water facilities shall have circular valve box covers with the inscription "RECYCLED " cast thereon per Section 15100, and shall be painted purple. Valve boxes for domestic water systems shall be as specified in Section 15100.

2. All valve boxes installed in unpaved areas (open space areas) shall be marked with a witness pole; in addition to the above referenced markings.

F. Color and Painting Schedule

1. Recycled water facilities shall be painted purple per Section 09900.

2. Domestic water facilities shall be blue, with the exception of fire hydrants which shall be painted as specified in Section 15139.

3. Witness poles for recycled water lines, valves and appurtenances shall be purple.

4. Witness poles for domestic water lines, valves and appurtenances shall be blue.

G. Restriction of Public Access

1. All off-site recycled water facilities shall be restricted from public access so that the general public cannot draw water from the system. Facilities such as air release assemblies, blow-off hydrants, blow offs on strainers, and other such facilities, shall be restricted from public access.

2. Recycled water facilities, both above and below grade, shall be housed in an approved lockable container colored purple. A sign reading "CAUTION: RECYCLED WATER" shall be installed, its size approved by the District representative. Other means of restricting public access may be approved by the District representative.

H. Warning Signs and Labels

1. The District requires warning labels to be installed on all appurtenances in vaults, such as, but not limited to, air release valves, blow offs, and meters, and on designated facilities, such as, but not limited to, controller panels and wash down or blow off hydrants on water trucks and temporary construction services.

2. Each pump and every pipe shall be identified with a painted label. In the fenced pump station area, at least one sign shall be posted on the fence which can be readily seen by all operations personnel utilizing the facilities.

3. Painted labels may, at the District representative's discretion be acceptable in lieu of plastic labels.

I. Domestic Water Piping

1. All domestic water piping shall be installed with domestic water identification.

2. All PVC domestic water piping shall be blue or shall be white with blue stenciling appearing on both sides of the pipe with the marking "DOMESTIC WATER" in 5/8-inch letters repeated every 12 inches.

3. Blue warning tape identifying it as a domestic water line and stating "CAUTION: DOMESTIC WATER-LINE BURIED BELOW" may be used as an alternate to blue or stenciled pipe. The tape shall run continuously for the entire length of the main line piping.

The tape shall be attached to the top of the pipe with plastic tape banded around the warning tape and pipe every 5 feet on center.

## PART 2 - MATERIALS

A. Buried Piping Warning Tape

The plastic warning tape shall be an inert plastic film specifically formulated for prolonged underground use and shall be prepared with black printing on a purple field having the words, "CAUTION: RECYCLED WATER-LINE." Warning tape for domestic water pipeline shall be blue with black printing having the words, "CAUTION: DOMESTIC WATER-LINE BURIED BELOW." The minimum thickness shall be 4 mils and the overall width of the tape shall be 12 inches (for 8-inch pipe) and 6 inches (for 6-inch and smaller pipe).

B. Warning Labels

Labels shall be inert plastic film specifically formulated for prolonged exposure and shall be prepared with black printing on a purple field having the words: "CAUTION: RECYCLED WATER FACILITY." The minimum thickness shall be 4 mils for adhesive backed labels and 10 mils for tag type labels. Tag type labels shall have reinforced tie holes and shall be attached with heavy-duty nylon fasteners. The size, type of label and location will be dictated by each individual application and subject to acceptance by the Districts representative. The minimum size shall be 1/2-inch letters.

## PART 3 - EXECUTION

A. Installation of Pipe Warning Tape

Warning tapes shall be installed directly on the top of the pipe longitudinally and shall be centered. The warning tape shall be installed continuously for the length of the pipe and shall be fastened to each pipe length by plastic adhesive tape banded around the pipe and warning tape at no more than 5-foot intervals. Taping attached to the sections of pipe before installing in the trench shall have 5-foot minimum overlap for continuous coverage.

B. Installation of Warning Labels

Warning labels shall be firmly attached to all appurtenances using heavy-duty nylon fasteners.

C. Installation of Witness Markers

Witness markers shall be installed over pipe in unpaved areas, open space areas, at appurtenances, including but not limited to valves, air release/vacuum breaks, dead ends, inflection points, tees, and at intervals not greater than 200 feet.
Witness markers shall be embedded into the soil at least 18-inches and shall be equipped with a barb or other such device to secure it in the surrounding soil.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15162**

# FLEXIBLE PIPE COUPLINGS AND EXPANSION JOINTS

## PART 1 - GENERAL

A. Description

This section includes materials and installation of flexible gasketed sleeve-type compression pipe couplings and expansion joints.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Painting and Coating: 09900

2. Hydrostatic Testing of Pressure Pipelines: 15042

C. Approved Manufacturers

1. Flexible Couplings
   - Dresser Style 253
   - Smith Blair Type 431
   - Baker Series 200

2. Transition Couplings
   - Dresser Style 38
   - Smith Blair Series 413
   - Baker Series 220

3. Flanged Coupling Adapters
   - Smith Blair Type 912
   - Dresser Style 227 (to 12-inches), Style 128 (above 12-inches)
   - Baker Series 601

## PART 2 - MATERIALS

A. Coupling Sleeve and Flanges

Coupling sleeves and flanges shall be ductile iron.

B. Bolts and Nuts for Flanges

1. Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be Type 316 stainless steel conforming to ASTM A 193 (Grade B8M) for bolts and ASTM A 194 (Grade 8M) for nuts.

2. Provide one (1) washer for each nut. Each washer shall be of the same material as the nut.

C. Painting and Coating

All cast components shall be epoxy lined and coated per Section 09900.

## PART 3 - EXECUTION

A. Installation of Flexible Pipe Couplings

1. Clean oil, scale, rust, and dirt from pipe ends. Clean gaskets in flexible pipe couplings before installing. Install expansion joints per manufacturer's recommendations. Install expansion joints so that 50% of total travel is available for expansion and 50% is available for contraction.

2. Lubricate bolt threads with graphite and oil prior to installation.

B. Field Coating

1. Coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09900. Then wrap the couplings with 8-mil polyethylene wrap per AWWA C105.

2. Coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above ground with the same coating system as specified for the adjacent pipe. Apply prime coat at factory.

C. Hydrostatic Testing

Hydrostatically test flexible pipe couplings, expansion joints, and expansion compensators in place with the pipe being tested. Test in accordance within Section 15042.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 15300**

# AUTOMATIC CONTROL VALVES

## PART I - GENERAL

A. Description

This section describes the materials and installation of self-contained automatic control valves. The various applications of these control valves are described herein. The various applications shall be achieved through specialized pilot control applications on hydraulically operated, diaphragm-actuated, globe pattern valves.

Items of equipment specified herein shall be the end products of a limited number of manufacturers in order to achieve standardization for operation, maintenance, spare parts, and manufacturer's service.

B. Related Work

| | | |
|---|---|---|
| 1. | Painting and Coating: | 09900 |
| 2. | Hydrostatic Testing of Pressure Pipelines: | 15042 |
| 3. | Ductile-Iron Pipe and Fittings: | 15056 |
| 4. | Copper, Brass and Bronze Pipe, Fittings and Appurtenances: | 15057 |
| 5. | Cement-Mortar-Lined and Coated Steel Pipe: | 15076 |
| 6. | Domestic and Recycled Water Facilities Identification: | 15151 |

C. Approved Manufacture's

1. Cla-Val Company
2. Singer Valve Inc.

D. Application Model Number

1. Check Valves

   Cla-Val model 81G-02KC with X101 Valve Position Indicator (installed by valve manufacturer)

2. Solenoid Control Valves

   Cla-Val model 136G-03YBCSFKC with Limit Switch Assembly Model X105LCW (installed by valve manufacturer).

3. Pressure Reducing Valves

   Cla-Val model 90G-01YBKC (90G-01YSFC for valves 3 inches and smaller), with X101 Valve Position Indicator (installed by valve manufacturer).

4. Pressure Relief Valves

   Cla-Val model 50G-01SBKC with Limit Switch Assembly Model X105LOW (installed by valve manufacturer).

5. Surge Anticipator Valves

   Cla-Val model 52G-01BKC with Limit Switch Assembly Model X105LOW (installed by valve manufacturer).

6. Pump Controller Valves

   Cla-Val model 60G-11 BKC with Limit Switch Assembly Model X105LCW (installed by valve manufacturer).

7. Two-Way Flow Altitude Valves with Differential Control

   Cla-Val model 201-01 with X-101 position indicator.

## PART 2 - MATERIALS

A. Complete Assemblies

All valves shall be complete, with all necessary operating appurtenances included in the work under this section.

B. Interior Lining and Exterior Coating

An epoxy coating shall be applied to internal and external ferrous valve surfaces. Coating shall be per AWWA C550. Unless specified otherwise, herein.

C. Globe Valve

All control valve applications shall be based on a hydraulically operated, diaphragm-actuated, globe pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half sides by a disc retainer and forming a tight seal against a single removable seat insert. The diaphragm assembly contacting a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist or nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted and there shall be not pistons operating the valve.

Valve shall be of indicated size and shall be of manufacturer's standard ductile iron with stainless steel trim (seat, disc guide, cover bearing, stem nut, and stem). Valve shall have a pressure rating of 150 or 300 psi, depending on the service application, with the appropriate class ductile iron flanges. Interior ferrous surfaces shall be lined with factory-applied epoxy and exterior ferrous surfaces shall be coated with alkyd enamel per Section 09900.

The design shall precluded cavitation erosion, fouling of working surfaces, and other effects adverse to reliability. Seats and other trim shall be secured by means precluding their loosening by hydraulically induced vibrations; and the fit of stems in guides and guide lengths shall preclude any binding, scraping, or deviation from true alignment affecting the free movement of working parts.

All repairs shall be possible without removing the valve from the line.

D. Check Valve

The check valve shall consist of a globe valve with the appropriate pilot system.

The pilot shall contain auxiliary controls which permit the adjustment of the opening and closing speeds, and shall be set for fast opening and slow closing.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

E. Solenoid Control Valve

The solenoid control valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a solenoid valve controlling a diaphragm-operated three-way auxiliary valve. The control system shall include opening and closing speed controls, a wye strainer and limit switch Model X105LCW.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

F. Pressure Reducing Valve

The pressure-reducing valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve, designed to permit flow when controlled pressure is less that the spring setting. The control system shall include a fixed orifice.

The pilot valve system shall have a direct acting, adjustable, spring-loaded pilot, diaphragm actuated valve, designed to permit flow in the pilot valve system whenever the controlling pressure exceeds the spring setting. The pilot valve system shall also contain a strainer needle valve assembly that shall control the opening or the main valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

G. Pressure Relief Valve

The pressure relief valve shall consist of a globe valve with the appropriate pilot system.

The pilot valve system shall have a direct acting, adjustable, spring-loaded pilot, diaphragm actuated valve, designed to permit flow in the pilot valve system whenever the controlling pressure exceeds the spring setting. The pilot valve system shall also contain a strainer needle valve assembly that shall control that closing of the main valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

H. Surge Anticipator Valve

The surge anticipator valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve. The pilot valve system shall contain a strainer needle valve assembly that shall control the closing of the main valve. The pilot valve system shall also contain a check valve that is installed on one of the main valve cover connections. This check valve shall be so installed that if low pressure occurs at the inlet of the valve, it will open and relieve the cover pressure to the inlet side of the valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

I. Pump Control Valve - Booster Type

This valve shall be a hydraulically operated, single seated, diaphragm actuated, composition disc, dual-port globe style valve with solenoid valve control. The valve shall have a built-in check feature; designed to operate with pump controls to start and stop pump against a closed valve.

Valves shall have emergency shutdown power check features for surge protection as described below: upon power failure, solenoids de-energize and a check valve in the diaphragm unit shall release to effect closure under spring action when flow stops before flow reversal can occur.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

A manual control override shall be provided on the valve assembly. The design shall preclude cavitation erosion, fouling of working surfaces, and other effects adverse to reliability. Seats and other trim shall be secured by means precluding their loosening by hydraulically induced vibrations; and the fit of stems in guides and guide lengths shall preclude any binding, scraping, or deviation from true alignment affecting the free movement of working parts.

The valve shall be provided with a SPDT limit switch actuated by the control rod. The switch shall indicate: 1) When the valve is fully closed; 2) When the valve is not fully closed.

J. Altitude Valve

The altitude valve shall consist of globe valve with the appropriate control system.

The control system shall consist of auxiliary valves working in conjunction with the pilot valve to control the main valve. The pilot valve is to be controlled by the difference between the reservoir

pressure and an adjustable spring pressure with a spring range of 5-40 feet of water. The entire valve and control assembly shall be designed so that no surface water can be drawn into the pilot system or the main valve at any time.

**PART 3- EXECUTION**

A. Manufacturer's Services

A manufacturer's representative for the equipment specified herein shall be present at the job site and/or classroom designated by the District for that minimum personnel days listed for the services hereunder, travel time excluded:

One (1) personnel day for equipment start up and one (1) personnel-day for post start-up training.

Start up services and training of District's personnel shall be at such times as requested by the Owner.

B. Installation

1. Automatic control valves shall be installed above ground or within a vault to provide for adjustment, maintenance and repair. Direct burial of a control valve will not be permitted under any circumstance.

2. Automatic control valves are to be installed with ductile iron piping per Section 15056 or cement-mortar lined and coated steel pipes per Section 15076.

3. Prior to purchase of material, inspect valve to confirm valve size, manufacturer, and part number.

C. Valve Refurbishment

1. Provide refurbishment parts recommended by valve manufacturer for complete refurbishment of valve.

2. Refurbishment shall be performed by technician certified or approved by the valve manufacturer.

D. Valve Adjustment and Testing

1. All valves installed, replaced, refurbished, or adjusted shall be tested.

2. Valves shall be adjusted to operate at set pressures as determined by the Engineer.

3. Set pressures shall be tested by operating downstream system to reduce pressure below set point and observing operation of the valves. Pressure gauges shall be provided along with other test equipment. District will operate the downstream system.

4. Valves shall be readjusted if necessary, to get operation at the designated pressure.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 22000**

**HOT WATER HEATERS (HOT WATER RECIRCULATION SYSTEMS AND POINT OF USE WATER HEATERS)**

## PART I - GENERAL

A. Description

This section includes requirements for materials for installation of Hot Water Recirculation Systems and Point-of-Use Water Heaters.

B. Submittals

1. Provide materials list showing materials utilized.
2. Provide Certificates of Compliance with all applicable Uniform Plumbing Code and California Building Code standards.

C. Application

There shall be a recirculation system or a water heater located within 10 linear pipe feet of every hot water fixture. Only Hot Water Recirculation System or Point -of-Use Water Heater designs that meet the requirements of this section shall be installed.

## PART 2 – HOT WATER RECIRCULATION SYSTEMS

A. Materials

Demand Controlled Recirculation Systems

1. Pump
   a. On-demand pump sized to move the water between 5 and 8 gpm in the recirculation loop.
   b. Pump shall be installed with unions and manual isolation valves on inlet and outlet to facilitate repair and replacement.

2. Controls and Activation Mechanisms
   a. Hard wired
      i. Button located in a switch plate in close proximity to hot water fixtures to activate the recirculation pump.
      ii. Motion Sensor located to trigger the recirculation pump when someone gets near the hot water fixture.

b. Wireless (remote control)
    i. Button. Give these to the homeowner so that they can put them where convenient. Possible locations include near the kitchen sink, at the head of the bed in the master bedroom, in the laundry room, on the mirror in the guest bathroom to trigger the recirculation pump.
    ii. Motion Sensor located to trigger the recirculation pump when someone gets near the hot water fixture.
c. Provide one activation mechanism for each hot water location, show location on plans. Provide an explanation if less than one activation mechanism per location is needed.

3. Acceptable manufactures of Demand Controlled Recirculation Systems shall be ACT Inc, Metlund Systems, Taco, or Wirsbo or equal.

Time and Temperature Controlled Recirculation Systems

1. The recirculation ump shall be installed with unions and manual isolation valves on inlet and outlet to facilitate repair and replacement
2. Controls and Activation Mechanisms
    a. System shall be equipped with a 24-hour timer which will automatically turn the pump "off" and "on" at preset times. The timer shall be set to run no more than 10 minutes every hour.
    b. System shall be equipped with a thermostatic control (aquastat). The aquastat shall turn the pump off when the temperature of the water in the return line has reached the upper limit of the aquastat and turn the pump on when the temperature of the water in the return line has reached the lower limit of the aquastat. The upper limit shall be no more than 115F and the lower limit shall be no lower than 105F. Preferably, the aquastat should be located immediately after the furthest branch line from the water heater.
3. Acceptable manufactures of Time and Temperature Controlled Recirculation Systems shall be Grundfos, Taco or Laing or equal.

B. Execution – Hot Water Recirculation System

1. Pumps – install pumps, controls and activation mechanisms in accordance with applicable codes and manufacturer's instructions.
2. Recirculation Loop
    a. System shall have a dedicated hot water recirculation return line that returns water to the hot water heater. The return line shall preferably be connected to the water heater drain outlet.
    b. A check valve shall be installed as close to the water heater as possible in the recirculation loop to prevent unintentional circulation. This check valve may be included at the pump.
    c. The recirculation loop shall be sized in accordance with the UPC. The recirculation loop shall have a minimum diameter of ¾ inch nominal anywhere in the loop including the return from the last fixture to the water heater.
    d. All hot water fixtures must be within 10 lineal feet of the recirculation loop.
    e. Keep the equivalent length of the recirculation loop to a minimum by minimizing the number of fittings.
        i. Copper and CPVC

1. Elbows – minimize to the extent practical the number of hard 90 degree elbows since these have a major impact on the equivalent feet and increase the resistance that the pump must overcome. Use manufactured wide sweeping elbows or bendable copper. Preferred radius is 8-12 times pipe diameter.
2. Couplings – minimize the number.
3. Tees – required for branch lines

ii. Cross-linked Polyethylene (PEX)
1. Elbows – minimize the number to the extent practical of hard 90 degree elbows since these have a major impact on the equivalent feet and increase the resistance that the pump must overcome. Use the tubing's flexibility to make the bends. Follow manufacturer's instructions for minimum radius on all bends.
2. Couplings – minimize their use since they also increase the equivalent feet and resistance. In general, make the joints at the tees for the branches.
3. Tees – required for branch lines

3. Branch Lines (lines that run from the recirculation loop to the fixture)
   a. Branch lines shall be the shortest possible length from the recirculation loop to the fixture with a maximum distance of 10 feet. Exceptions may be requested for island sinks, tubs (not tub-shower combos) and washing machines, and must be approved by the District.
   b. Select the diameter of the branch lines in accordance with the UPC, in general ½" or less. Exceptions must be approved by the district engineer or his/her representative.
   c. Each fixture should be served with its own branch line. Example exceptions include: a branch line serving two sinks so that the total distance from the water heater to each sink is less than 10 plumbing feet, or a water heater serving a sink and a shower or tub/shower combo. Exceptions must be approved.
   d. Minimize the number of fittings in the branch lines to the extent practical, particularly hard elbows.
4. Insulation
   a. The entire recirculation loop and all branch lines must be insulated.
   b. Minimum R-4 pipe insulation shall be used per Title 24 of the California Code of Regulations.
   c. Install in accordance with manufacturer's specifications.
5. Commissioning the system
   a. Purge all pipes before installing the pump to remove air and other unwanted materials.
   b. Get the water heater(s) up to the desired temperature in accordance with the water heater manufacturer's instructions.
   c. Follow the manufacturer's instructions applicable to each pump, controls and activation mechanisms to ensure that the system is operating correctly.
   d. Preheat the recirculation loop to check for proper operation.
   e. Verify that less than two cups of cool water come out of each fixture before hot water arrives at that fixture.
6. Customer Education
   a. Provide the homeowner with all warranty and operational material supplied by the manufacturer. This information must include what to do in the event of a water or electricity outage. This information should advise the customer how and when the system should be turned off to prevent damage.
   b. Demand Controlled Recirculation Systems

i. Provide stickers for each switch plate and remote button that say “Press before you want hot water”

c. Time and Temperature Controlled Recirculation Systems
   i. Provide stickers that tell how to adjust the timer and controls.

C. Warranties

1. All hot water recirculation systems shall have a minimum of a two year guarantee from the date of manufacture.

## PART 3 – POINT OF USE WATER HEATERS

A. Materials

1. Point-of-Use Water Heaters
   a. Select water heaters sized for the load based on the fixtures served.
   b. Water heaters may be tank or tankless.
   c. Water heaters should be installed with isolation valves and unions to facilitate maintenance.
   d. Install in accordance with applicable codes and manufacturer’s instructions.

B. Execution

1. Piping
   a. Install the shortest possible length of pipe between the water heater and fixture(s) with a maximum distance of 10 feet. Exceptions may be requested for island sinks, tubs (not tub-shower combos) and washing machines, and must be approved.
   b. Each fixture shall be served with its own branch line. Example exceptions include: a branch line serving two sinks so that the total distance from the water heater to each sink is less than 10 plumbing feet, or a water heater serving a sink and a shower or tub/shower combo. Exceptions must be approved.
   c. Select the diameter of the branch lines in accordance with the plumbing code, in general ½ or less. Exceptions must be approved by the District.
   d. Minimize the number of fittings in the branch lines, particularly hard elbows.
2. Insulation
   a. All hot water piping must be insulated.
   b. Minimum R-4 pipe insulation shall be used per Title 24 of the California Code of Regulations.
   c. Install in accordance with manufacturer’s specifications.
3. Commissioning the water heaters
   a. Follow the manufacturer’s instructions applicable to each water heater to ensure that it is operating correctly.
4. Customer Education
   a. Provide homeowner with all warranty and operational material supplied by the manufacturer of each water heater.

**END OF SECTION**

STANDARD SPECIFICATIONS

**SECTION 22100**

**WATER CONSERVING APPLIANCES AND FIXTURES**

## PART I - GENERAL

A. Description

This section includes requirements for materials for High-Efficiency Toilets (HET), High-Efficiency Clothes Washers and Zero Water Use Urinals.

B. Submittals

1. Provide materials list showing materials utilized.
2. Provide Certificates of Compliance with all applicable Uniform Plumbing Code and California Building Code standards.

## PART 2 – MATERIALS

A. High-Efficiency Toilets – maximum flush of 1.3 gallons per flush and dual flush toilets (.8 gallon and 1.6 gallons per flush.)

1. Conform to ASME A112.19.2-2003
2. Shall have a maximum flush of 1.3 gallons per flush.
3. Acceptable HET models shall be as follows or equal:

Dual-Flush Toilet Fixtures

Caroma

Caravelle Model 989646, 989770, 989680,989760
Reflections Model 989750, 989720
Royale 305
Sovereign 305 Model 989750
Tasman 270 Model 989860
Vintage 270 Model 605310Bowl/625070Tank
Walvit[3] Model 604118 (round-front)
Walvit (elongated)

Mansfield

Eco-Quantum Model 148-119, 147-119, 146-119RH, 147-119RH, 148-119RH, 146-119
Kohler

Sterling Rockton Model 402024

4.8-Liters - 1.28-Gallons per Flush Gravity-Fed Toilet Fixture

American Standard

FloWise Model 2073.013: 3018.013 bowl – 4023.013 tank

4.0-Liters and 1.0-Gallon per Flush Pressure-Assist Toilet Fixtures

Capizzi

Turbo Capizzi High Profile: 0478 bowl – 1578 tank, Low Profile: 0413 bowl – 1513 tank

Mansfield

QuantumOne 146-153 round front
QuantumOne 148-153 elongated (ADA)
QuantumOne 147-153 elongated

B. High-Efficiency Clothes Washers
   1. Shall utilize 8.5 gallons of water to wash one cubic foot of wash load
   2. Acceptable HET models shall be as follows or equal:

Kenmore Model 4292, 4282, 430

Maytag Model 6500

Whirlpool Model 9100, 9200

C. Zero Water Use Urinal
   1. Shall utilize no water to flush waste
   2. Acceptable Zero Water Use Urinal:

Falcon Water Free Model U1P5001, U2A4001
Waterless No-Flush Model 2003, 2004

## PART 3 – EXECUTION

High-efficiency toilets and High-Efficiency Clothes Washers shall be installed in accordance with manufacturer's instructions.

**END OF SECTION**

# STANDARD PLANS

## FOR CONSTRUCTION OF DOMESTIC WATER, SEWER AND RECYCLED WATER FACILITIES

**Marina Coast Water District**
11 Reservation Road
Marina, CA 92933
(831) 582-2665

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13 January 2024

**MEMORANDUM**

To: Jack Gao, EIT, PMP (MCWD)

From: Jeff Shaw, PG, CHg (EKI)
Vera Nelson, PE (EKI)

Subject: Review of Available Video Logs and Other Data on Former Desalination Plant Wells (EKI B60094.23)

Marina Coast Water District (MCWD) has requested EKI review downhole video files for the intake and discharge wells at its existing seawater desalination facility located at 11 Reservation Road, Marina, CA, adjacent to Marina State Beach. MCWD is interested in evaluating these wells for potential rehabilitation and use at its desalination plant, which is currently off-line. This analysis does not include an evaluation of (a) the current or future impacts of coastal erosion on the brine injection well, the seawater intake well, or associated facilities, conveyances, or equipment; or (b) existing permits for the existing seawater intake well[1] (Schaaff & Wheeler, 2010)

**MCWD BRINE INJECTION WELL (NORTH)**

EKI reviewed downhole video of the well listed in the video title as the "Brine Outfall" well, located at the northwest corner (approximately 36.700235°, -121.808878°) of the Marina Coast Water District former wastewater treatment plant. A map and schematic well profile diagram from a 1996 Fugro report (Plates 1 - 3, Proj. No. 95-71-2901, attached) for the Brine Injection Well indicate it has the following construction details:

- State Well ID: Record currently unavailable
- Owner's Well ID: Brine Injection Well
- Date constructed: Record currently unavailable
- Surface completion: Above ground surface
- Casing: 16-in diameter fiberglass reinforced plastic (FRP)
- Screened: 65 - 105 feet below ground surface (ft bgs), 0.050" horizontal slot (video shows louvered steel)
- Total depth: 115 ft bgs (cased); 120 ft (borehole)

Observations from review of the video log are summarized in the table below.

[1] The memorandum prepared by Schaaff & Wheeler in 2010 concludes that: "The existing intake well was constructed on Marina State Beach property under a 1996 agreement and permit granted by California Department of Parks and Recreation. The term of the permit was ten years, with the option to extend for an additional ten years. At the end of the term, the well and pipeline must be removed." A copy of the Permit is included as an attachment to the Schaaf & Wheeler 2010 Memorandum.

| Depth from Top of Casing | Video Log Observations - Brine Outfall (Injection) Well |
|---|---|
| 0.0 ft | Zero depth OK at Top of casing (TOC); droplets or condensation on downview lens; fiberglass casing clearly identifiable. |
| 25.3 ft | Obstruction in casing, above water level. Probable separated pump column discharge pipe (with flange). Appears to be 3”-4” diameter steel pipe. |
| 26.3 ft | Camera cannot proceed, operator withdraws and restarts run with cleaned lens; works camera past top of lost pump column. |
| 27.8 ft | Sideview, top of lost pump column; underside of flange. (from return trip out) |
| 57.9 ft | Water level in casing; trash & plastic soda bottles floating at surface; water cloudy, turbidity limits visibility; camera offset in casing (probably due to lost pump column). Sideview on return trip confirms water level depth. |
| 67.1 ft | Top of perforations; louvered / shutter screen visible; moderate to heavy algal or bacterial accumulation on louvers. |
| 75 ft | Turbidity increasing downward, water very murky, floating organic debris common. |
| 80 ft | Zero visibility; downview camera light or lens covered? |
| 80.7 ft | Switched to sideview; functional, water slightly less turbid. |
| 87.4 ft | Tool apparently bottomed out in sediment; downview camera not illuminated. Start return trip. |

**MCWD SEAWATER INTAKE WELL (SOUTH)**

EKI reviewed downhole video of the “Marina Coast Water - Beach Well", located at the southwest corner of the former Marina wastewater treatment plant (approximately 36.698609°, -121.809366°). Some noted objects in the video log were only observable in downview, so related depths listed below are approximate. Instrument was apparently lowered manually in downview mode with the trip back up in sideview mode. Maximum illumination ring in the video is approximately 1.8 ft below the on-screen camera depth annotation.

The DWR well completion report (WCR No. 474426, well 14S / 01E 24L50) for the Seawater Intake Well and a map and schematic well profile diagram from the 1996 Fugro report describing the wells (Plates 1 - 3, Proj. No. 95-71-2901) list the following construction details. **Note that the screened interval and total cased depth listed in the WCR and Fugro Plate 2 do not match the depths observed in the video**.

- State Well ID: 14S/01E-24L50
- Owner's Well ID: Seawater Intake Well
- Date constructed: 24 January 1996
- Surface completion: Below grade in vault
- Casing: 12-in diameter fiberglass reinforced plastic (FRP)
- Screened: 60 - 80 ft bgs, 0.050" horizontal slot (from WCR)
  (**video shows probable wire-wrapped screen from 46 to 66 ft bgs**)
- Total depth: 90 ft bgs (cased); 95 ft (borehole)
  (**video shows approximately 71 ft total cased depth**)

Observations from review of the video log are summarized in the table below.

| Depth from Top of Casing | Video Log Observations - Seawater Intake Well |
|---|---|
| 0.0 ft | Zero depth is slightly below TOC; fiberglass casing clearly identifiable; glue or sealant visible at top of casing. |
| 14.7 ft | Water level in casing; water is clear, low turbidity. Confirmed depth from sideview on trip out. |
| 46.0 ft | Top of wire-wrapped probable steel screened interval, moderately coated in sediment or biofilms |
| 51 ft | Thin tubular objects protruding from screen, possibly pieces of former airline( ?) |
| 52 ft | Apparent tubing & fittings (1/4"?) debris jammed in screen; does not block passage of camera |
| 55 ft | Camera passes bulk of debris, knocks it loose; debris falls into well. |
| 62 ft | Screen encrustation heavier below 62 ft |
| 66.2 ft | Bottom of screened interval (viewed sideview on return trip, confirmed depth) |
| 71 ft | Debris and sediment in well sump, bottom of well. |

**RECOMMENDATIONS**

MCWD Brine Injection Well (North)

Based on the figures and video logs reviewed, the Brine Injection Well casing is undamaged in the sections visible, but at least 18 feet of sediment has filled the bottom of the casing, and a lost pump column or discharge pipe of 3"-4" diameter is present in the casing from approximately 27.8 feet below top of casing (ft bTOC) down to the total observable depth of the well. Condition of the well casing and screen from 87.4 ft bTOC to its total reported depth of 115 ft bgs cannot be determined from the video log, but the

presence of approximately 18 ft of sediment or sand in the bottom of the well suggests the possibility that the screen or casing was breached below 87.4 ft bgs. If the screen is breached, the well is damaged beyond repair and should be destroyed and abandoned in compliance with County and State well destruction standards.

If the well was to be used, it would need to be sampled for chemical and microbial analysis, then rehabilitated through removal of the lost pump column and any other retrievable debris in the bottom of the casing, then bailed free of sand and sediment, brushed, swabbed, and overpumped, and possibly chemically treated, depending on analytical results of water and sediment samples. Removal of the lost pump column without damage to the fiberglass casing could be difficult or impossible. The Brine Injection Well therefore is in poor condition, rehabilitation and reuse of the well is likely infeasible, and EKI recommends the well to be destroyed.

MCWD Seawater Intake Well (South)

Based on the figures and video logs reviewed, the Seawater Intake Well casing is undamaged in the sections visible. Some buildup of sediment, biofilm, or encrustation was observed in the lower portion of the screened interval, starting at approximately 62 ft bTOC and extending to the accessible depth of the well at 71 ft bTOC. Some debris buildup including a short section of what appears to be thin metal tubing and fittings, possibly part of a formerly-installed airline for water level determination, is located in the bottom of the well. Other than the debris and moderate encrustation of the screen, no serious problems were visible with the well.

Review of background documents (Feeny, 1998) indicates that feed water from the intake well occasionally produced water that exceeded the turbidity limits for operation of the reverse-osmosis facility, requiring the plant to shut down. In the winter and spring of 1998 turbidity levels did not decrease to acceptable levels even after large amounts of water were produced and modifications to the pump location were made. Therefore, the filter pack in this well may not be adequate to maintain low levels of turbidity under long-term operating conditions.

In either case, prior to any use, the well would need to be sampled for chemical, turbidity, and microbial analysis, then rehabilitated through removal of retrievable debris in the bottom of the casing, then bailed clean, brushed, swabbed, and overpumped, and possibly chemically treated, depending on analytical results of water and sediment samples.

Hydraulic Testing

EKI also recommends conducting injection and extraction pumping tests or at minimum, specific capacity tests in the wells after rehabilitation, to understand current production and injection parameters.

**References**

Feeney, 1998, *Memorandum: Back-up Feed Water Well Basis of Design.* Martin Feeney, 12 August 1998 (included as attachment to Schaaf & Wheeler, 2010).

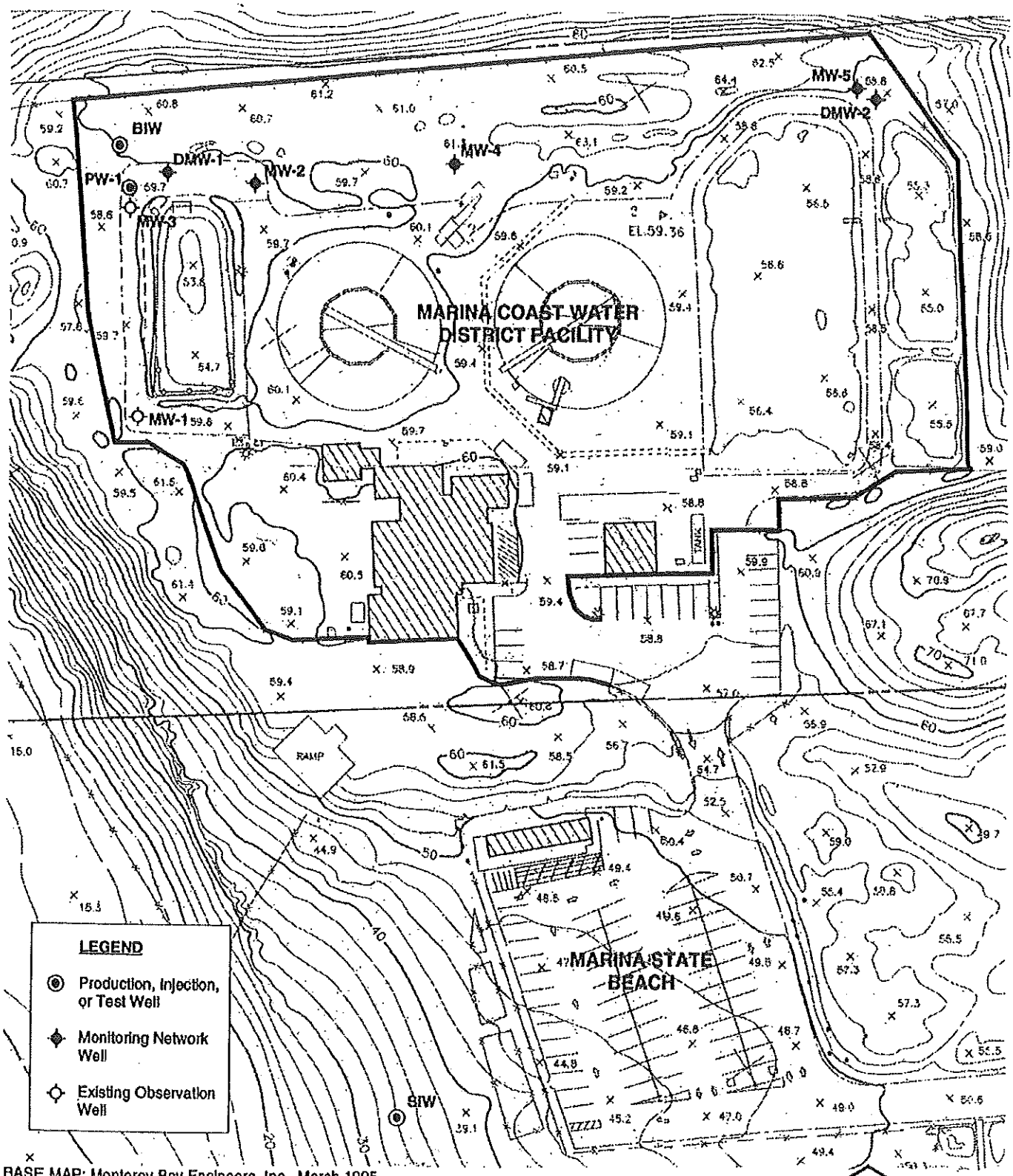
Schaaf & Wheeler, 2010. *Memorandum; Desalination Plant Facilities Erosion Mitigation Alternatives*. Dated 3 May 2010.

**Attachments**

1996 Fugro report (partial), Plates 1 - 3, Proj. No. 95-71-2901

DWR Well Completion Report No. 474426 (well 14S / 01E 24L50)

# Attachments

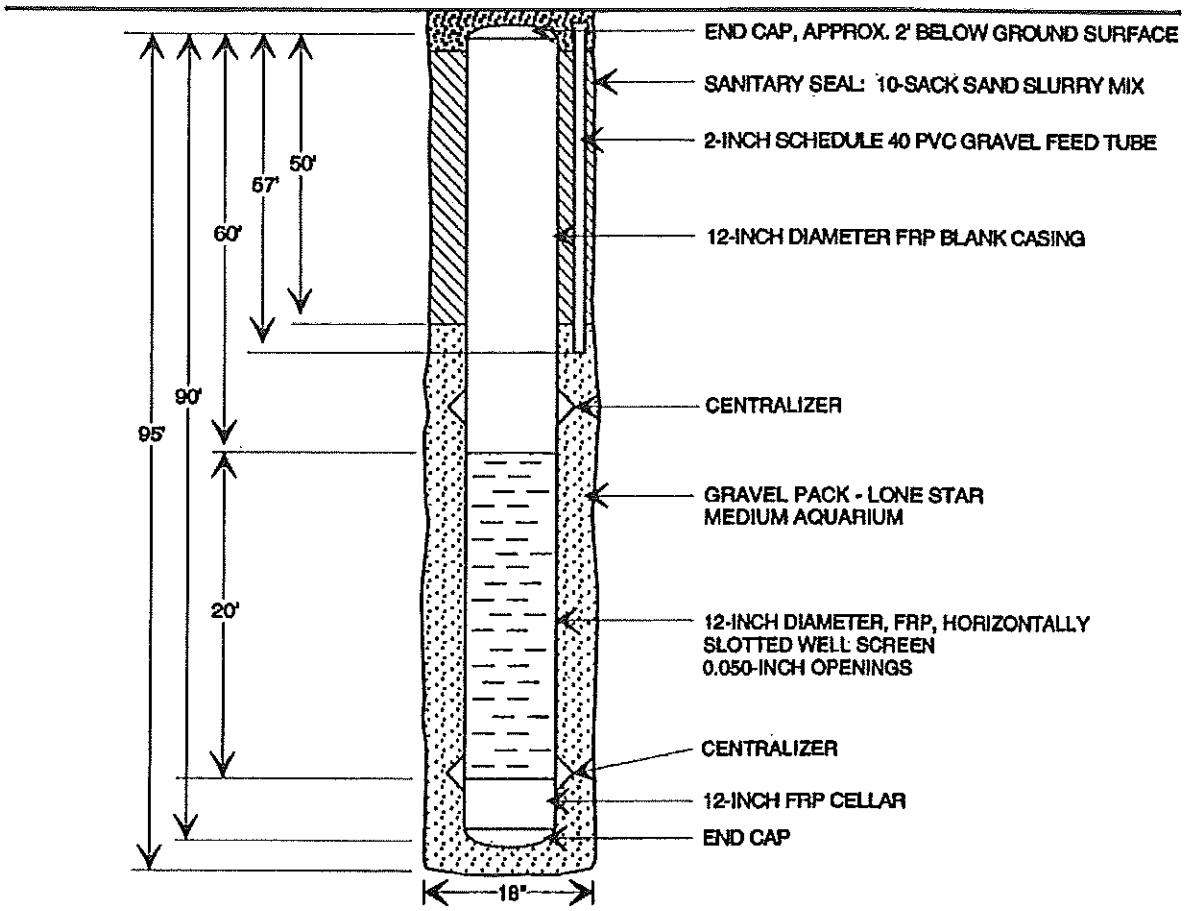



BASE MAP: Monterey Bay Engineers, Inc., March 1995.

# WELL LOCATION MAP

Marina Coast Water District

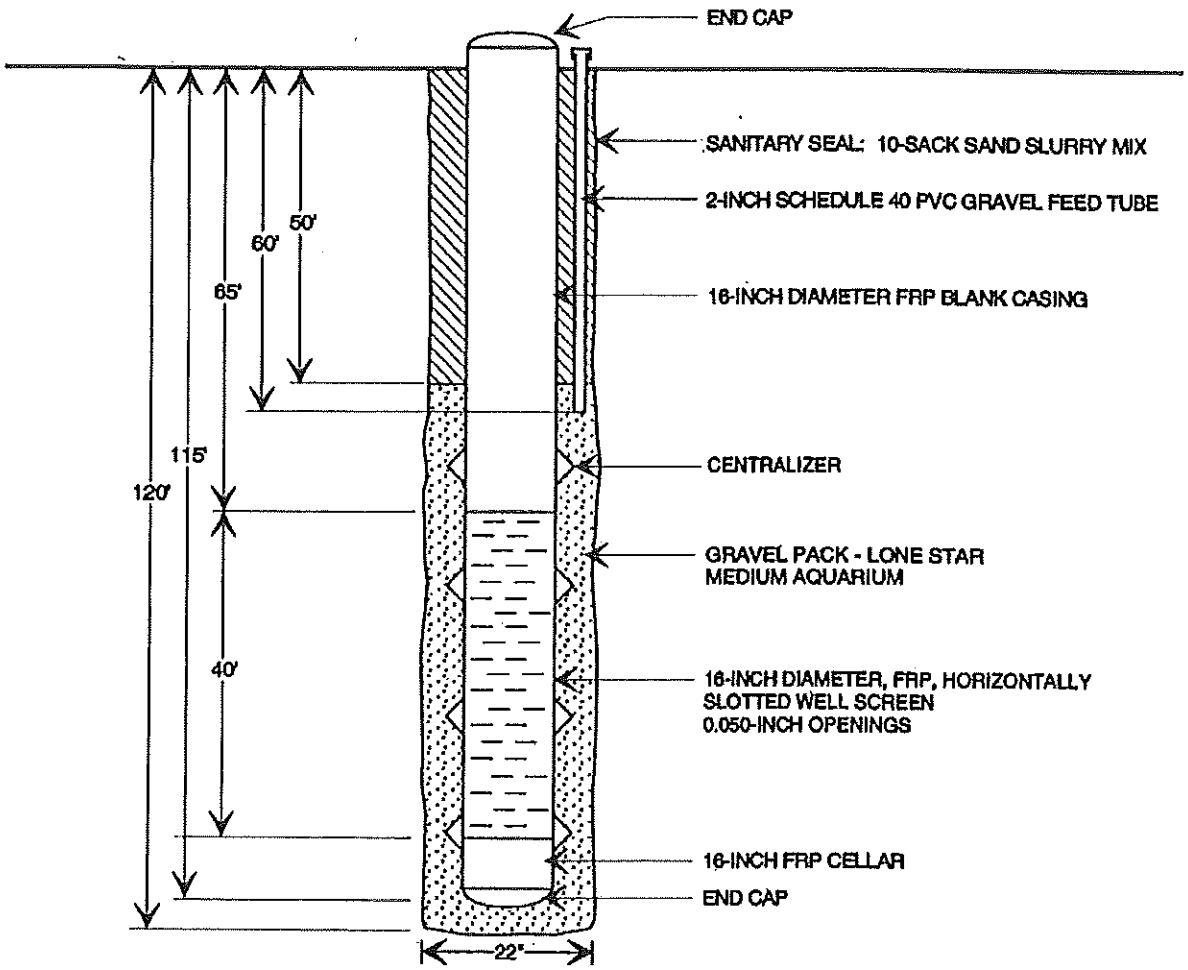
PLATE 1




**NOT TO SCALE**

## SEAWATER INTAKE WELL
Marina Coast Water District

PLATE 2




**NOT TO SCALE**

## BRINE INJECTION WELL
Marina Coast Water District

PLATE 3

ORIGINAL FC#21364
File with DWR

STATE OF CALIFORNIA
# WELL COMPLETION REPORT
*Refer to Instruction Pamphlet*

DWR USE ONLY — DO NOT FILL IN
14S/01E24L50
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
14S/01E24L50
APN/TRS/OTHER

Page 1 of 1
Owner's Well No. Seawater Intake Well (SIW) No. 474426
Date Work Began 1/24/96 Ended 1/24/96
Local Permit Agency Monterey County Environ. Health
Permit No. WSAL 95-331 Permit Date 12/21/95

## GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 32 (FT.) BELOW SURFACE

| DEPTH FROM SURFACE Ft. | to Ft. | DESCRIPTION *Describe material, grain size, color, etc.* |
|---|---|---|
| 0 | 20 | Brown dune sand. |
| 20 | 42 | Yellow/brown med. gr. sand |
| 42 | 60 | Gray/brown, med. gr. sand |
| 60 | 83 | Coarse sand. |
| 83 | 95 | Dark olive brown silt. |

ENTERED

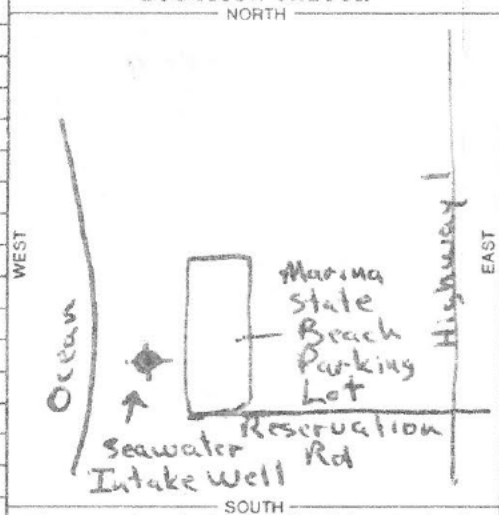
TOTAL DEPTH OF BORING 95 (Feet)
TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

[redacted]

## WELL LOCATION

Address 11 Reservation Rd (Marina State Beach)
City Marina
County Monterey
APN Book 033 Page 192 Parcel 001
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC.

### LOCATION SKETCH




*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.*
***PLEASE BE ACCURATE & COMPLETE.***

### ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

### PLANNED USE (✓)
___ MONITORING
WATER SUPPLY
___ Domestic
✓ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Direct Rotary FLUID Guar Gum

### WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

### CASING(S)

| DEPTH FROM SURFACE Ft. | to Ft. | BORE-HOLE DIA. (Inches) | TYPE (✓) BLANK | SCREEN | CONDUCTOR | FILL PIPE | MATERIAL/ GRADE | INTERNAL DIAMETER (Inches) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 60 | 18 | ✓ | | | | Fiberglass | 12 | 0.24" | — |
| 60 | 80 | " | | ✓ | | | " | " | | 0.050 |
| 80 | 90 | " | ✓ | | | | " | " | | — |

### ANNULAR MATERIAL

| DEPTH FROM SURFACE Ft. | to Ft. | TYPE CEMENT (✓) | BENTONITE (✓) | FILL (✓) | FILTER PACK (TYPE/SIZE) |
|---|---|---|---|---|---|
| 0 | 50 | ✓ | | | |
| 50 | 95 | | | | Lone Star |
| | | | | | Med A |

### ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___
*ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.*

### CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief
NAME EuroWest, Inc./R.L. Redfearn Drilling (Bakersfield) (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
5855 Olivas Park Dr. ADDRESS Ventura CITY CA STATE 9300 ZIP
Signed Michael S Burke WELL DRILLER/AUTHORIZED REPRESENTATIVE 1/24/96 DATE SIGNED 62885 C-57 LICENSE NUMBER

DWR 188 REV. 7-90 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
# WELL COMPLETION REPORT
*Refer to Instruction Pamphlet*

DWR USE ONLY – DO NOT FILL IN
14S/01E-24L5Ø
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. Seawater Intake Well (SIW) No. 474426
Date Work Began 1/24/96 Ended 1/24/96
Local Permit Agency Monterey County Environ. Health
Permit No. WSAI 95-331 Permit Date 12/21/95

## GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 32 (Ft.) BELOW SURFACE

| DEPTH FROM SURFACE Ft. | to Ft. | DESCRIPTION *Describe material, grain size, color, etc.* |
|---|---|---|
| 0 | 20 | Brown dune sand. |
| 20 | 42 | Yellow/brown med gr. sand |
| 42 | 60 | Gray/brown, med gr. sand |
| 60 | 83 | Coarse sand. |
| 83 | 95 | Dark olive brown silt. |

TOTAL DEPTH OF BORING 95 (Feet)
TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

## WELL OWNER

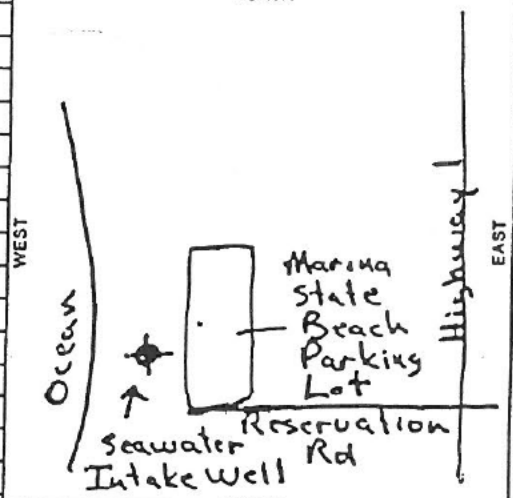
14S/01E-24L5Ø

[redacted]

## WELL LOCATION

Address 11 Reservation Rd (Marina State Beach)
City Marina
County Monterey
APN Book 033 Page 192 Parcel 001
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

## LOCATION SKETCH




*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.*

## ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

## PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
✓ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Direct Rotary FLUID Guar Gum

## WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

## CASING(S)

| DEPTH FROM SURFACE Ft. | to Ft. | BORE-HOLE DIA. (Inches) | TYPE (✓) BLANK | SCREEN | CON-DUCTOR | FILL PIPE | MATERIAL/GRADE | INTERNAL DIAMETER (Inches) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 60 | 18 | ✓ | | | | Fiberglass | 12 | 0.24" | — |
| 60 | 80 | " | | ✓ | | | " | " | | 0.050 |
| 80 | 90 | " | ✓ | | | | " | " | | — |

## ANNULAR MATERIAL

| DEPTH FROM SURFACE Ft. | to Ft. | TYPE CEMENT (✓) | BENTONITE (✓) | FILL (✓) | FILTER PACK (TYPE/SIZE) |
|---|---|---|---|---|---|
| 0 | 50 | ✓ | | | |
| 50 | 95 | | | | Lone Star Med Aq. |

## ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

## CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME FugroWest, Inc./R.L. Redfearn Drilling (Bakersfield)
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5855 Olivas Park Dr. Ventura CA 93003
ADDRESS CITY STATE ZIP

Signed [signature] 1/24/96 628851
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

WR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

State No. 14S/01E-24L5

# WELL DATA

DISTRICT MARINA

[redacted]

State No. 14S/01E-24L5
Other No.

Type of Well: Hydrograph ☐ Key ☐ Index ☐ Semiannual ☐
Location: County Monterey Basin No.
U.S.G.S. Quad. Quad. No.
¼ ¼ Section , Twp. , Rge. MD SB H Base & Meridian
Description Marina Coast Water District Desalination Plant Sea Water Intake Well located on the Marina State Beach.

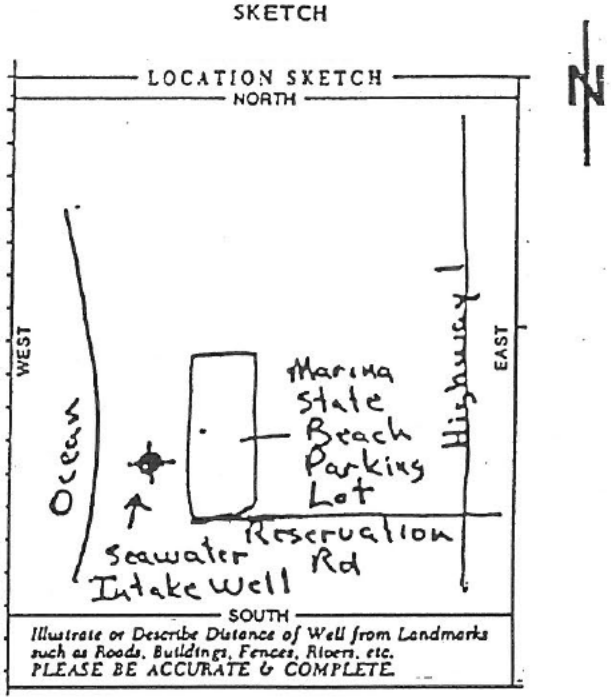
Reference Point description

which is ft. above below land surface. Ground Elevation ft.
Reference Point Elev. ft. Determined from
Well: Use Sea Water Intake Well Condition Depth 90 ft.
Casing, size 12 in., perforations 60 - 80 ft

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐
Chief Aquifer: Name Depth to Top Aq. Depth to Bot. Aq.
Type of Material Perm. Rating Thickness
Gravel Packed? Yes ☑ No ☐ Depth to Top Gr. Depth to Bot. Gr.
Supp. Aquifer Depth to Top Aq. Depth to Bot. Aq.
Driller Fugro West Inc./Redfairn Drilling (Bakersfield)
Date drilled Jan 24, 196 Log, filed Jan 24, 1996 open (1) confidential (2)
Equipment: Pump, type Submersible, ss make Grundfos
Serial No. Size of discharge pipe 6/12 in.
Power, Kind Electric Make Grundfos
H. P. 30 Motor Serial No.
Elec. Meter No. 435035 Transformer No. T-1776
Yield 520 G.P.M. Pumping level 56 ft.

Water Analysis: Min. (1) Son. (2) H.M. (3)
Water Levels available: Yes (1) No
Period of Record: Begin End
Collecting Agency:
Prod. Rec. (1) Pump Test (2) Yield (3)

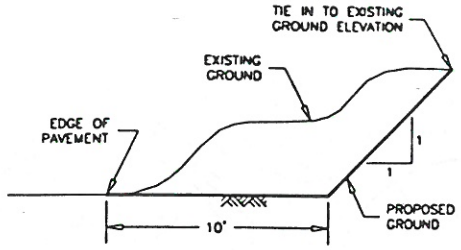
SKETCH



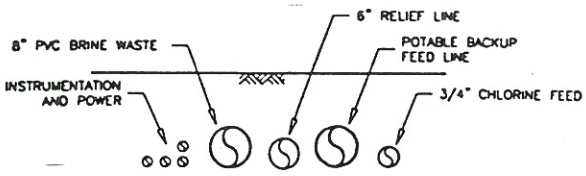

*Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.*

REMARKS

Recorded by: Manuel Saavedra
Date 5-30-97

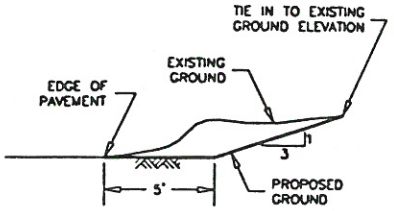



EXCAVATION FOR FEED WATER PIPE INSTALLATION

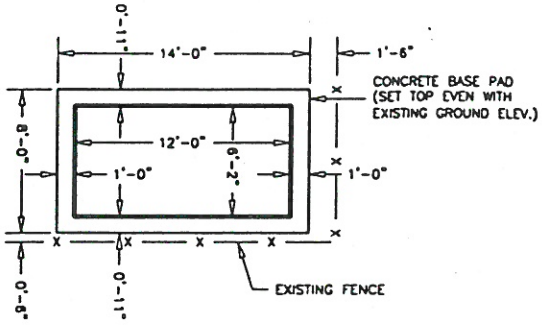



## UTILITY TRENCH SECTION (A / C2)

NTS




FINAL GRADE




## TYP. SAND REMOVAL SECTION (E / C2)

NTS

## $CO_2$ TANK DETAIL (4 / C2)

NTS

$CO_2$ STORAGE TANK SEE DETAIL (4 / C2)

STATE BEACH OFFICE

INV EL 48.80
N 8892
E 7387

N 8957
E 7387

4" ABS/PVC, s=0.036

4" ABS/PVC s=0.056

4" ABS/PVC s=0.045

N 8861
E 7452

INV EL 47.76
N 8876
E 7377

N 8853
E 7412

SAND REMOVAL AREA

DEMOLISH SEPTIC TANKS (TYP OF 3)

6" ABS/PVC s=0.056

N 8920
E 7272

N 8840
E 7345

4" ABS/PVC, s=0.020

INV EL 45.64
N 8836
E 7351

GRINDER PUMP SEE DETAIL (3 / C4)

N 8825
E 7314

STATE BEACH RESTROOMS

(E / C2)

2" PVC/PE

45'±

HOT TAP TO EXISTING SEWER FORCE MAIN

N 8926
E 7028

RW SFM W G

# SEAWATER DESALINATION SITE PLAN

| | |
|---|---|
| DATE: 4/02/96 | |
| SCALE: 1" = 30' | |
| DESIGN: KMO/JHL | |
| DRAWN: LJK/JHL | |
| CHECKED: PCJ | |

SHEET C2 OF 26