FALLBROOK PUBLIC UTILITY DISTRICT

TOYON PUMP STATION PIPELINE EXTENSION PROJECT

JOB NO. 3131

CONTRACT DOCUMENTS

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NOTICE INVITING BIDS

The Fallbrook Public Utility District ("District") will receive sealed bids for the **TOYON P.S. PIPLINE EXTENSION** Project at **Fallbrook Public Utility District, 990 E. Mission Road, Fallbrook, CA 92028** no later than **Wednesday NOVEMBER 6, 2024 at 3:00 PM**, at which time or thereafter said bids will be opened and read aloud. Bids received after this time will be returned unopened. Bids shall be valid for 60 calendar days after the bid opening date.

The work generally consists of the installation of approximately 850+ linear feet of 8" C.M.L.&C Steel Pipe, Three (3) 8" GV, Two (2) 2" Plug Valves for Airvacs, One (1) 2" Plug Valve for Blow-Off Drain, according to the plans. The construction estimate for this project is **$425,000**.

Only bidders that have previously submitted pre-qualification packages for pipeline and valve replacement projects, and been pre-qualified by the District are eligible to bid. Electronic copies of project documents will be made available for no cost at the District's office at 990 E. Mission Road, Fallbrook, CA 92028, or via contact below.

Bids must be accompanied by cash, a certified or cashier's check, or a Bid Bond in favor of District in an amount not less than ten percent (10%) of the submitted Total Bid Price.

A **mandatory** Pre-Bid Conference will be held at 990 E. Mission Road, Fallbrook CA, on the following date(s) and time(s): **Wednesday OCTOBER 16TH, 2024, at 10:00 A.M.** Each and every Bidder must attend the Pre-Bid Conference. Prospective bidders may visit the Project Site. Bids will not be accepted from any bidder who did not attend the Pre-Bid Conference.

The successful bidder must submit a Performance Bond equal to 100% of the contract price prior to execution of the Contract. Also, if a contract awarded to the successful bidder will exceed $25,000, a Payment Bond equal to 100% of the contract price must also be submitted to the District prior to execution of the Contract. All bonds are to be secured from a surety that meets all of the State of California bonding requirements, as defined in Code of Civil Procedure Section 995.120, and is admitted by the State of California.

Pursuant to Public Contract Code Section 22300, the successful bidder may substitute certain securities for funds withheld by District to ensure his performance under the Contract.

The Director of Industrial Relations has determined the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract which will be awarded to the successful bidder, copies of which are on file and will be made available to any interested party upon request at FPUD Corporate Office at 990 E. Mission Road, Fallbrook, CA 92028 or online at http://www.dir.ca.gov/dlsr. A copy of these rates shall be posted by the successful bidder at the job site. The successful bidder and all subcontractor(s) under him, shall comply with all applicable Labor Code provisions, which include, but are not limited to the payment of not less than the required prevailing rates to all workers employed by them in the execution of the Contract, the employment of apprentices, the hours of labor and the debarment of contractors and subcontractors.

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. 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. 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.

This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this project, it shall be the bidder's sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this Contract and applicable law in its bid.

Each bidder shall be a licensed contractor pursuant to the Business and Professions Code and shall be licensed in the following appropriate classification(s) of contractor's license(s), for the work bid upon, and must maintain the license(s) throughout the duration of the Contract: Class A General Engineering Contractor.

Award of Contract: District shall award the Contract for the Project to the lowest responsible bidder as determined from the base bid alone by District. District reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process.

For further information, contact Kevin Collins at 760-999-2734, or kcollins@fpud.com

END OF NOTICE INVITING BIDS

INSTRUCTIONS TO BIDDERS

1. AVAILABILITY OF CONTRACT DOCUMENTS

Bids must be submitted to District on the Bid Forms which are a part of the Bid Package for the Project. Prospective bidders may obtain one (1) complete set of Contract Documents at no cost. Contract Documents may be obtained from District at the location(s) and at the time(s) indicated in the Notice Inviting Bids. Prospective bidders are encouraged to telephone in advance to determine the availability of Contract Documents. Any applicable charges for the Contract Documents are outlined in the Notice Inviting Bids.

District may also make the Contract Documents available for review at one or more plan rooms, as indicated in the Notice Inviting Bids. Please Note: Prospective bidders who choose to review the Contract Documents at a plan room must contact District to obtain the required Contract Documents if they decide to submit a bid for the Project.

2. EXAMINATION OF CONTRACT DOCUMENTS

District has made copies of the Contract Documents available, as indicated above. Bidders shall be solely responsible for examining the Project Site and the Contract Documents, including any Addenda issued during the bidding period, and for informing itself with respect to local labor availability, means of transportation, necessity for security, laws and codes, local permit requirements, wage scales, local tax structure, contractors' licensing requirements, availability of required insurance, and other factors that could affect the Work. Bidders are responsible for consulting the standards referenced in the Contract. Failure of Bidder to so examine and inform itself shall be at its sole risk, and no relief for error or omission will be given except as required under State law.

3. INTERPRETATION OF CONTRACT DOCUMENTS

Discrepancies in, and/or omissions from the Plans, Specifications or other Contract Documents or questions as to their meaning shall be immediately brought to the attention of District by submission of a written request for an interpretation or correction to District. Such submission, if any, must be sent to Keven Collins by emailing to kcollins@fpud.com.

Any interpretation of the Contract Documents will be made only by written addenda duly issued and mailed or delivered to each person or firm who has purchased a set of Contract Documents. District will not be responsible for any explanations or interpretations provided in any other manner. No person is authorized to make any oral interpretation of any provision in the Contract Documents to any bidder, and no bidder should rely on any such oral interpretation.

Bids shall include complete compensation for all items that are noted in the Contract Documents as the responsibility of the Contractor.

4. INSPECTION OF SITE; PRE-BID CONFERENCE AND SITE WALK

Each prospective bidder is responsible for fully acquainting itself with the conditions of the Project Site (which may include more than one site), as well as those relating to the construction and labor of the Project, to fully understand the facilities, difficulties and restrictions which may impact

the cost or effort required to complete the Project. To this end, a Pre-Bid Conference and Site Walk will be held on the date(s) and time(s) indicated in the Notice Inviting Bids.

5. ADDENDA

District reserves the right to revise the Contract Documents prior to the bid opening date. Revisions, if any, shall be made by written Addenda. All Addenda issued by District shall be included in the bid and made part of the Contract Documents. Pursuant to Public Contract Code Section 4104.5, if District issues an Addendum which includes material changes to the Project less than 72 hours prior to the deadline for submission of bids, District will extend the deadline for submission of bids. District may determine, in its sole discretion, whether an Addendum warrants postponement of the bid submission date. Each prospective bidder shall provide District a name, address and facsimile number to which Addenda may be sent, as well as a telephone number by which District can contact the bidder. Copies of Addenda will be furnished by facsimile, first class mail, express mail or other proper means of delivery without charge to all parties who have obtained a copy of the Contract Documents and provided such current information. Please Note: Bidders are responsible for ensuring that they have received any and all Addenda. To this end, each bidder should contact the District's Engineering Department to verify that he has received all Addenda issued, if any, prior to the bid opening.

6. ALTERNATE BIDS

If alternate bid items are called for in the Contract Documents, the lowest bid will be determined on the basis of the base bid only. However, District may choose to award the contract on the basis of the base bid alone or the base bid and any alternate or combination of alternates. The time required for completion of the alternate bid items has been factored into the Contract duration and no additional Contract time will be awarded for any of the alternate bid items. District may elect to include one or more of the alternate bid items, or to otherwise remove certain work from the Project scope of work, accordingly each Bidder must ensure that each bid item contains a proportionate share of profit, overhead and other costs or expenses which will be incurred by the Bidder.

7. COMPLETION OF BID FORMS

Bids shall only be prepared using copies of the Bid Forms which are included in the Contract Documents. The use of substitute bid forms other than clear and correct photocopies of those provided by District will not be permitted. Bids shall be executed by an authorized signatory as described in these Instructions to Bidders. In addition, Bidders shall fill in all blank spaces (including inserting "N/A" where applicable) and initial all interlineations, alterations, or erasures to the Bid Forms. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms nor make substitutions thereon. USE OF BLACK OR BLUE INK, INDELIBLE PENCIL OR A TYPEWRITER IS REQUIRED. Deviations in the bid form may result in the bid being deemed non-responsive.

8. MODIFICATIONS OF BIDS

Each Bidder shall submit its Bid in strict conformity with the requirements of the Contract Documents. Unauthorized additions, modifications, revisions, conditions, limitations, exclusions or provisions attached to a Bid may render it non-responsive and may cause its rejection. Bidders

shall neither delete, modify, nor supplement the printed matter on the Bid Forms, nor make substitutions thereon. Oral, telephonic and electronic modifications will not be considered, unless the Notice Inviting Bids authorizes the submission of electronic bids and modifications thereto and such modifications are made in accordance with the Notice Inviting Bids.

9. DESIGNATION OF SUBCONTRACTORS

Pursuant to State law, the Bidders must designate (a) the name and location of each subcontractor who will perform work or render services for the Bidder in an amount that exceeds one-half of one percent (1/2%) of the Bidder's Total Bid Price, (b) the California contractor license number, and (c) the portion of work each such subcontractor will perform on the form provided herein by District. No additional time will be provided to bidders to submit any of the requested information in the Designation of Subcontractor form.

10. LICENSING REQUIREMENTS

Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, all bidders must possess proper licenses for performance of this Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted. Pursuant to Section 7028.5 of the Business and Professions Code, District shall consider any bid submitted by a contractor not currently licensed in accordance with state law and pursuant to the requirements found in the Contract Documents to be non-responsive, and District shall reject the Bid. District shall have the right to request, and Bidders shall provide within five (5) calendar days, evidence satisfactory to District of all valid license(s) currently held by that Bidder and each of the Bidder's subcontractors, before awarding the Contract.

11. SIGNING OF BIDS

All Bids submitted shall be executed by the Bidder or its authorized representative. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the Bid to bind the Bidder to each Bid and to any Contract arising therefrom.

If a Bidder is a joint venture or partnership, it may be asked to submit an authenticated Power of Attorney executed by each joint venturer or partner appointing and designating one of the joint venturers or partners as a management sponsor to execute the Bid on behalf of Bidder. Only that joint venturer or partner shall execute the Bid. The Power of Attorney shall also: (1) authorize that particular joint venturer or partner to act for and bind Bidder in all matters relating to the Bid; and (2) provide that each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of Bidder assumed under the Bid and under any Contract arising therefrom. The Bid shall be executed by the designated joint venturer or partner on behalf of the joint venture or partnership in its legal name.

12. BID GUARANTEE (BOND)

Each bid shall be accompanied by: (a) cash; (b) a certified check made payable to District; (c) a cashier's check made payable to District; or (d) a bid bond payable to District executed by the bidder as principal and surety as obligor in an amount not less than 10% of the maximum amount of the bid. Personal sureties and unregistered surety companies are unacceptable. The surety

insurer shall be California admitted surety insurer, as defined in Code of Civil Procedure Section 995.120. The cash, check or bid bond shall be given as a guarantee that the bidder shall execute the Contract if it be awarded to the bidder, shall provide the payment and performance bonds and insurance certificates and endorsements as required herein within ten (10) calendar days after notification of the award of the Contract to the bidder. Failure to provide the required documents may result in forfeiture of the bidder's bid deposit or bond to District and District may award the Contract to the next lowest responsible bidder, or may call for new bids.

13. SUBMISSION OF SEALED BIDS

Once the Bid and supporting documents have been completed and signed as set forth herein, they shall be placed, along with the Bid Guarantee and other required materials in an envelope, sealed, addressed and delivered or mailed, postage prepaid to District at the place and to the attention of the person indicated in the Notice Inviting Bids. No oral or telephonic bids will be considered. No forms transmitted via the Internet, e-mail, facsimile, or any other electronic means will be considered unless specifically authorized by District as provided herein. The envelope shall also contain the following in the lower left-hand corner thereof:

Bid of Bidder's Name **for the TOYON PIPELINE EXTENSION PROJECT**

Only where expressly permitted in the Notice Inviting Bids, may Bidders submit their bids via electronic transmission pursuant to Public Contract Code Sections 1600 and 1601. The acceptable method(s) of electronic transmission shall be stated in the Notice Inviting Bids. District reserves the right to not accept electronically transmitted bids where not specifically authorized in the Notice Inviting Bids, and may reject any bid not strictly complying with District's designated methods for delivery.

14. DELIVERY AND OPENING OF BIDS

Bids will be received by District at the address shown in the Notice Inviting Bids up to the date and time shown therein. District will leave unopened any Bid received after the specified date and time, and any such unopened Bid will be returned to the Bidder. It is the Bidder's sole responsibility to ensure that its Bid is received as specified. Bids may be submitted earlier than the dates(s) and time(s) indicated.

Bids will be opened at the date and time stated in the Notice Inviting Bids, and the amount of each Bid will be read aloud and recorded. All Bidders may, if they desire, attend the opening of Bids. District may in its sole discretion, elect to postpone the opening of the submitted Bids. District reserves the right to reject any or all Bids and to waive any informality or irregularity in any Bid. In the event of a discrepancy between the written amount of the Bid Price and the numerical amount of the Bid Price, the written amount shall govern.

15. WITHDRAWAL OF BID

Prior to bid opening, a Bid may be withdrawn by the Bidder only by means of a written request signed by the Bidder or its properly authorized representative.

16. BASIS OF AWARD, BALANCED BIDS

District shall award the Contract to the lowest responsible Bidder submitting a responsive Bid.

District may reject any Bid which, in its opinion when compared to other bids received or to District's internal estimates, does not accurately reflect the cost to perform the Work. District may reject as non-responsive any bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

17. DISQUALIFICATION OF BIDDERS; INTEREST IN MORE THAN ONE BID

No bidder shall be allowed to make, submit or be interested in more than one bid. However, a person, firm, corporation or other entity that has submitted a subproposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a subproposal or quoting prices to other bidders submitting a bid to District. No person, firm, corporation, or other entity may submit subproposal to a bidder, or quote prices of materials to a bidder, when also submitting a prime bid on the same Project.

18. INSURANCE REQUIREMENTS

The successful bidder shall procure the insurance in the form and in the amount specified in the Contract Documents.

19. AWARD PROCESS

Once all Bids are opened and reviewed to determine the lowest responsive and responsible Bidder, District's Board of Directors may award the contract. The apparent successful Bidder should begin to prepare the following documents: (1) the Performance Bond; (2) the Payment Bond (if applicable); and (3) the required insurance certificates and endorsements. Once District notifies the Bidder of the award, the Bidder will have ten (10) consecutive calendar days from the date of this notification to execute the Contract and supply District with all of the required documents and certifications. Regardless whether the Bidder supplies the required documents and certifications in a timely manner, the Contract time will begin to run ten (10) calendar days from the date of the notification. Once District receives all of the properly drafted and executed documents and certifications from the Bidder, District shall issue a Notice to Proceed to that Bidder.

20. FILING OF BID PROTESTS

Bidders may file a "protest" of a Bid with District's Engineering Manager. In order for a Bidder's protest to be considered valid, the protest must:

A. Be filed in writing within five (5) calendar days after the bid opening date;

B. Clearly identify the specific irregularity or accusation;

C. Specify, in detail, the grounds of the protest and the facts supporting the protest; and

D. Include all relevant, supporting documentation with the protest at time of filing.

If the protest does not comply with each of these requirements, it will be rejected as invalid.

If the protest is valid, District's Engineering Manager, or other designated District staff member, shall review the basis of the protest and all relevant information. The Engineering Manager will provide a written decision to the protestor. The protestor may then appeal the decision of the Engineering Manager to the General Manager.

21. WORKERS COMPENSATION

Each bidder shall submit the Contractor's Certificate Regarding Workers' Compensation form.

22. SUBSTITUTION OF SECURITY

The Contract Documents call for monthly progress payments based upon the percentage of the work completed. District will withhold retention from each progress payment as provided by the Contract Documents. At the request and expense of the successful Bidder, District will substitute securities for the amount so retained in accordance with Public Contract Code Section 22300.

23. PREVAILING WAGES

District has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract. These rates are on file and available at Fallbrook Public Utility District or may be obtained online at http://www.dir.ca.gov/dlsr. Bidders are advised that a copy of these rates must be posted by the successful Bidder at the job site(s).

24. DEBARMENT OF CONTRACTORS AND SUBCONTRACTORS

In accordance with the provisions of the Labor Code, contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Section 1777.1 or Section 1777.7 of the Labor Code. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid to a debarred subcontractor by the Contractor for the Project shall be returned to District. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the Project.

25. IRAN CONTRACTING ACT CERTIFICATION

Each bidder shall submit the certification required by the Iran Contracting Act of 2010, Public Contract Code section 2200 et seq. as provided with the Bid Documents.

26. PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

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. 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. 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. To this end, Bidder shall sign and submit with its Bid the Public Works Contractor Registration Certification on the form provided, attesting to the facts contained therein. Failure to submit this form may render the Bid non-responsive. In addition, each bidder shall provide the registration number for each listed subcontractor in the space provided in the Designation of Subcontractors Form.

27. PERFORMANCE BOND AND PAYMENT BOND REQUIREMENTS

Within the time specified in the Contract Documents, the Bidder to whom a Contract is awarded shall deliver to District four identical counterparts of the Performance Bond and Payment Bond (if required) in the form supplied by District and included in the Contract Documents. A Performance Bond shall be submitted for all contracts. A Payment Bond is required for all contracts in excess of $25,000. Failure to do so may, in the sole discretion of District, result in the forfeiture of the Bid Guarantee. The surety supplying the bond must be an admitted surety insurer, as defined in Code of Civil Procedure Section 995.120, authorized to do business as such in the State of California and satisfactory to District. The Performance Bond and the Payment Bond shall be for one hundred percent (100%) of the Contract Price.

28. REQUEST FOR SUBSTITUTIONS

The successful bidder shall comply with the substitution request provisions set forth in the Special Conditions, including any deadlines for substitution requests **which may occur prior to the bid opening date**.

29. SALES AND OTHER APPLICABLE TAXES, PERMITS, LICENSES AND FEES

Contractor and its subcontractors performing work under this Contract will be required to pay California sales tax and other applicable taxes, and to pay for permits, licenses and fees required by the agencies with authority in the jurisdiction in which the work will be located, unless otherwise expressly provided by the Contract Documents.

30. EXECUTION OF CONTRACT

As required herein the Bidder to whom an award is made shall execute the Contract in the amount determined by the Contract Documents. District may require appropriate evidence that the persons executing the Contract are duly empowered to do so.

INSTRUCTIONS TO BIDDERS

1B-01. **GENERAL** The Contract Documents will be available for examination without charge, and copies may be secured in accordance with the Notice Inviting Bids. Terms used in the Bidding Requirements shall have the meanings defined in the Conditions of the Contract.

1B-02. **EXAMINATION BY BIDDERS** At his own expense and prior to submitting his Bid, each Bidder shall (a) examine the Bid and Contract Documents, (b) visit the site and determine the local conditions which in any way affect the performance of the work including the prevailing wages and other pertaining cost factors, (c) familiarize himself with all Federal, state and local laws, ordinances, rules, regulations and codes affecting the performance of the work including the cost of permits and licenses required for the work, (d) make such surveys and investigations, including investigation of subsurface or latent physical conditions at the site or where work is to be performed, as he may deem necessary for performance of the work at his Bid price within the terms of the Contract Documents, (e) determine the character, quality, and quantities of the work to be performed and the materials and equipment to be provided, and (f) correlate his observations, investigations, and determinations with the requirements of the Contract Documents. The Contract Documents show and describe the existing conditions as they are believed to exist, and the surveys, investigations, and other data which have been used in the design of the work. Neither the Owner nor the Engineer shall be liable for any loss sustained by the Contractor resulting from any variance between the conditions and design data given in the Contract Documents and the actual conditions revealed during the Bidder's examination or during the progress of the work.

1B-03. **EXPERIENCE REQUIREMENTS**

A. All bidders must have a Class A General Engineering contractor according to the laws of the state of California and have a minimum of five years practical experience and successful history in site work and Water/Waste Water Pipeline construction.

B. All bidders are required to have a minimum of five (5) years practical experience and successful history in the construction of buried Water/Wastewater Pipelines. They shall substantiate this requirement by furnishing a written list of five references, including the owner's name and contact information with their bid. The references must be recent projects completed within the last three years. The Owner has the sole right to evaluate the bidders experience and determine if they are qualified. Owner may allow substitution of key personal experience for company experience at Owners sole determination.

BID FORM

NAME OF BIDDER:_____

The undersigned, hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any, for the following Project:

TOYON PIPELINE EXTENSION PROJECT

BID SCHEDULE

NO.	ITEM DESCRIPTION	UNIT OF MEASURE	EST. QTY.	UNIT PRICE	ITEM COST
1.	Initial Mobilization / Demobilization	LS	1		
2.	Shoring per Excavation Safety Measures in State Labor Code Sections 6705 and 6707	LS	1		
3.	Dewatering	LS	1		
4.	General Pipe Construction Sta. 0+00 – 8+44+	LS	1		

In case of discrepancy between the unit price and the item cost set forth for a unit basis item, the unit price shall prevail and, shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Item Cost" column, then the amount set forth in the "Item Cost" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price. Final payment shall be determined by the Engineer from measured quantities of work performed based upon the unit price.

TOTAL BID PRICE (BASED ON BID SCHEDULE TOTAL OF UNIT PRICES):

$ _____
Total Bid Price in Numbers

_____
Total Bid Price in Written Form

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

SECTION 00100 – CONTRACT DOCUMENTS
BID FORM

The undersigned agrees that this Bid Form constitutes a firm offer to District which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the bid opening, or until a Contract for the Work is fully executed by District and a third party, whichever is earlier.

The Contract duration shall commence on the date stated in District's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in District's Notice to Proceed.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. _____, Expiration Date _____, class of license _____. If the bidder is a joint venture, each member of the joint venture must include the above information.

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents.

Addenda No. _____

Addenda No. _____

Addenda No. _____

1. Attached is the required bid security in the amount of not less than 10% of the Total Bid Price.

2. Attached is the fully executed Non-Collusion Declaration form.

3. Attached is the completed Designation of Subcontractors form.

4. Attached is the completed Bidder Information Form.

5. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.

6. Attached is the completed Iran Contracting Act Certification form.

7. Attached is the completed Public Works Contractor Registration Certification form.

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder _____

Signature _____

Print Name and Title _____

Dated _____

END OF BID FORM

CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION

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

Name of Bidder _____

Signature _____

Name _____

Title _____

Dated _____

END OF CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION

BID BOND

The makers of this bond are _____, as Principal, and _____, as Surety and are held and firmly bound unto the Fallbrook Public Utility District, hereinafter called District, in the penal sum of TEN PERCENT (10%) OF THE TOTAL BID PRICE of the Principal submitted to District for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying bid dated _____, 20 ___, Old Stage Pipeline Replacement.

If the Principal does not withdraw its bid within the time specified in the Contract Documents; and if the Principal is awarded the Contract and provides all documents to District as required by the Contract Documents; then this obligation shall be null and void. Otherwise, this bond will remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents shall in affect its obligation under this bond, and Surety does hereby waive notice of any such changes.

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

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20___, the name and corporate seal of each corporation.

_____ (Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Attach Acknowledgment Form)

_____ (Corporate Seal)

Surety

By _____

Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title _____

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally

appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
- ☐ Corporate Officer

_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-attorney to local representatives of the bonding company must also be attached.

END OF BID BOND

NON-COLLUSION DECLARATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

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

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

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

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

Name of Bidder _____

Signature _____

Name _____

Title _____

END OF NON-COLLUSION DECLARATION

CONTRACTOR INFORMATION AND EXPERIENCE FORM

A. INFORMATION ABOUT BIDDER

Indicate not applicable ("N/A") where appropriate.

NOTE: Where Bidder is a joint venture, pages shall be duplicated and information provided for all parties to the joint venture.

1.0 Name of Bidder: _____

2.0 Type, if Entity: _____

3.0 Bidder Address: _____

_____

_____

_____

Facsimile Number Telephone Number

4.0 How many years has Bidder's organization been in business as a Contractor? _____

5.0 How many years has Bidder's organization been in business under its present name? _____

5.1 Under what other or former names has Bidder's organization operated?:_____

6.0 If Bidder's organization is a corporation, answer the following:

6.1 Date of Incorporation: _____

6.2 State of Incorporation: _____

6.3 President's Name: _____

6.4 Vice-President's Name(s): _____

_____

6.5 Secretary's Name: _____

6.6 Treasurer's Name: _____

7.0 If an individual or a partnership, answer the following:

7.1 Date of Organization: _____

7.2 Name and address of all partners (state whether general or limited partnership):

_____

_____

_____

8.0 If other than a corporation or partnership, describe organization and name principals:

_____

_____

9.0 List other states in which Bidder's organization is legally qualified to do business.

_____

_____

_____

10.0 What type of work does the Bidder normally perform with its own forces?

_____

_____

11.0 Has Bidder ever failed to complete any work awarded to it? If so, note when, where, and why:

_____

_____

12.0 Within the last five years, has any officer or partner of Bidder's organization ever been an officer or partner of another organization when it failed to complete a contract? If so, attach a separate sheet of explanation:

_____

_____

14.0 List Trade References:

_____

_____

_____

_____

15.0 List Bank References (Bank and Branch Address):

_____

_____

_____

_____

16.0 Name of Bonding Company and Name and Address of Agent:

_____

_____

_____

B. LIST OF CURRENT PROJECTS (Backlog)

[**Duplicate Page if needed for listing additional current projects.**]

Project	Description of Bidder's Work	Completion Date	Cost of Bidder's Work

C. LIST OF COMPLETED PROJECTS - LAST THREE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate Bidder's ability to perform the required Work.

Project Client	Description of Bidder's Work	Period of Performance	Cost of Bidder's Work

D. EXPERIENCE AND TECHNICAL QUALIFICATIONS QUESTIONNAIRE

Personnel:

The Bidder shall identify the key personnel to be assigned to this project in a management, construction supervision or engineering capacity.

1. List each person's job title, name and percent of time to be allocated to this project:

2. Summarize each person's specialized education:

3. List each person's years of construction experience relevant to the project:

4. Summarize such experience:

Bidder agrees that personnel named in this Bid will remain on this Project until completion of all relevant Work, unless substituted by personnel of equivalent experience and qualifications approved in advance by District.

Additional Bidder's Statements:

If the Bidder feels that there is additional information which has not been included in the questionnaire above, and which would contribute to the qualification review, it may add that information in a statement here or on an attached sheet, appropriately marked:

END OF CONTRACTOR INFORMATION AND EXPERIENCE FORM

LIST OF SUBCONTRACTORS FORM

In compliance with the Subletting and Subcontracting Fair Practices Act of the Public Contract Code of the State of California, each bidder shall set forth below: (a) the name and the location of the place of business, (b) the California contractor license number, and (c) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price. Notwithstanding the foregoing, if the work involves streets and highways, then the Contractor shall list each subcontractor who will perform work or labor or render service to Contractor in or about the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price or $10,000, whichever is greater. No additional time shall be granted to provide the below requested information.

If no subcontractor is specified, for a portion of the work, or if more than one subcontractor is specified for the same portion of Work, to be performed under the Contract in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price, then the Contractor shall be deemed to have agreed that it is fully qualified to perform that Work, and that it shall perform that portion itself.

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License Number	DIR Registration Number

SECTION 00100 – CONTRACT DOCUMENTS
LIST OF SUBCONTRACTORS FORM

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License Number	DIR Registration Number

Name of Bidder _____

Signature _____

Name & Title _____

Dated _____

END OF LIST OF SUBCONTRACTORS FORM

IRAN CONTRACTING ACT CERTIFICATION

(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.

□ The District has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the District 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.

Name of Bidder: _____

Signature: _____

Name: _____

Title: _____

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 IRAN CONTRACTING ACT CERTIFICATION

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

If this bid is due on or after March 1, 2015, then 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 is currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: _____

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.

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

END OF PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

CONTRACT

THIS CONTRACT is made this _____ day of _____, 20__, in the County of San Diego, State of California, by and between the Fallbrook Public Utility District hereinafter called District, and _____, hereinafter called Contractor. District and the Contractor for the considerations stated herein agree as follows:

ARTICLE 1. SCOPE OF WORK. The Contractor shall perform all Work within the time stipulated the Contract and shall provide all labor, materials, equipment, tools, utility services, and transportation to complete all of the Work required in strict compliance with the Contract Documents as specified in Article 5 below for the following Project:

TOYON PIPELINE EXTENSION PROJECT

The Contractor and its surety shall be liable to District for any damages arising as a result of the Contractor's failure to comply with this obligation.

ARTICLE 2. TIME FOR COMPLETION. The Work shall be commenced on the date stated in District's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within 240 calendar days from the commencement date stated in the Notice to Proceed. By its signature hereunder, Contractor agrees the time for completion set forth above is adequate and reasonable to complete the Work.

ARTICLE 3. CONTRACT PRICE. District shall pay to the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of _____ Dollars ($_____). Payment shall be made as set forth in the General Conditions.

ARTICLE 4. LIQUIDATED DAMAGES. In accordance with Government Code section 53069.85, it is agreed that the Contractor will pay District the sum of $5,000 for each and every calendar day of delay beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event this is not paid, the Contractor agrees District may deduct that amount from any money due or that may become due the Contractor under the Contract. This Article does not exclude recovery of other damages specified in the Contract Documents.

ARTICLE 5. COMPONENT PARTS OF THE CONTRACT. The "Contract Documents" include the following:

Notice Inviting Bids
Instructions to Bidders
Bid Form
Contractor's Certificate Regarding Workers' Compensation
Bid Bond
Designation of Subcontractors
Information Required of Bidders

Non-Collusion Declaration form
Iran Contracting Act Certification
Public Works Contractor Registration Certification
Contract
Performance Bond
Payment Bond (if required)
General Conditions
Special Conditions
Technical Specifications
Addenda
Plans and Drawings
Approved and fully executed change orders
Any other documents contained in or incorporated into the Contract

The Contactor shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. This Contract shall supersede any prior agreement of the parties.

ARTICLE 6. PROVISIONS REQUIRED BY LAW. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of the California Labor Code applicable to this Project.

ARTICLE 7. INDEMNIFICATION. Contractor shall provide indemnification as set forth in the General Conditions.

ARTICLE 8. PREVAILING WAGES. Contractor shall be required to pay the prevailing rate of wages in accordance with the Labor Code which such rates shall be made available at District's Corporate Office or may be obtained online at http//www.dir.ca.gov/dlsr. and which must be posted at the job site.

IN WITNESS WHEREOF, this Contract has been duly executed by the above-named parties, on the day and year above written.

FALLBROOK PUBLIC UTILITY DISTRICT

_____
Name of Contractor

By_____

By_____

Date: _____

_____

Print Name and Title:

License No. _____

Date: _____

(ALL SIGNATURES MUST BE NOTARIZED AND CORPORATE SEALS AFFIXED, IF APPLICABLE)

END OF CONTRACT

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the Fallbrook Public Utility District (hereinafter referred to as "District") has awarded to _____, (hereinafter referred to as the "Contractor") _____ an agreement for _____ (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto District in the sum of _____ DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless District, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees incurred by District in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by District, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect District from loss or damage resulting from or caused by defective materials or faulty workmanship, the above obligation in penal sum thereof shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever Contractor shall be, and is declared by District to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at District's option:

(1) Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

(2) Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and District, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by District under the Contract and any modification thereto, less any amount previously paid by District to the Contractor and any other set offs pursuant to the Contract Documents.

(3) Permit District to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by District under the Contract and any modification thereto, less any amount previously paid by District to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that District may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if District, when declaring the Contractor in default, notifies Surety of District's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

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

(Corporate Seal)

_____
Contractor/ Principal

By _____

Title _____

(Corporate Seal) Surety _____

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate) Title _____

Signatures of those signing for the Contractor and Surety must be notarized and evidence of corporate authority attached.

The rate of premium on this bond is _____ per thousand. The total amount of premium charges, $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____
_____
_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____
_____

(Telephone number of Surety and Agent or Representative for service of process in California _____

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20_____, before me, _____, Notary Public, personally
appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document
and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

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STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally
appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document
and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

END OF PERFORMANCE BOND

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that:

WHEREAS, the Fallbrook Public Utility District (hereinafter designated as "District"), by action taken or a resolution passed _____, 20___ has awarded to _____ _____ hereinafter designated as the "Principal," a contract for the work described as _____ follows:

_____

(the "Project"); and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto District in the penal sum of _____ Dollars ($_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified, and also, in case suit is brought upon this bond, all litigation expenses incurred by District in such suit, including reasonable attorneys' fees, court costs, expert witness fees and investigation expenses.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of

claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or District and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

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

(Corporate Seal)

_____
Contractor/ Principal

By _____

Title _____

_____
Surety

(Corporate Seal)

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title _____

Signatures of those signing for the Contractor and Surety must be notarized and evidence of corporate authority attached.

The rate of premium on this bond is _____ per thousand. The total amount of premium charges, $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____

_____

_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____

_____

_____

(Telephone number of Surety and Agent or Representative for service of process in California _____

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally
appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document
and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally
appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document
and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

END OF PAYMENT BOND

GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS

a. Acceptable, Acceptance or words of similar import shall be understood to be the acceptance of the Engineer and/or District.

b. Act of God is an earthquake in excess of a magnitude of 3.5 on the Richter scale and tidal waves.

c. Approval means written authorization by Engineer and/or District .

d. Contract Documents includes all documents as stated in the Contract.

e. District and Contractor are those stated in the Contract. The terms District and Owner may be used interchangeably.

f. Day shall mean calendar day unless otherwise specifically designated.

g. Engineer shall mean the General Manager, or his or her designee, of the District, acting either directly or through properly authorized agents, such as agents acting within the scope of the particular duties entrusted to them. Also sometimes referred to as “District’s Representative” or “Representative” in the Contract Documents.

h. Equal, Equivalent, Satisfactory, Directed, Designated, Selected, As Required and similar words shall mean the written approval, selection, satisfaction, direction, or similar action of the Engineer and/or District.

i. Indicated, Shown, Detailed, Noted, Scheduled or words of similar meaning shall mean that reference is made to the drawings, unless otherwise noted. It shall be understood that the direction, designation, selection, or similar import of the Engineer and/or District is intended, unless stated otherwise.

j. Install means the complete installation of any item, equipment or material.

k. Material shall include machinery, equipment, manufactured articles, or construction such as form work, fasteners, etc., and any other classes of material to be furnished in connection with the Contract. All materials shall be new unless specified otherwise.

l. Perform shall mean that the Contractor, at Contractor’s expense, shall take all actions necessary to complete The Work, including furnishing of necessary labor, tools, and equipment, and providing and installing Materials that are indicated, specified, or required to complete such performance.

m. Project is The Work planned by District as provided in the Contract Documents.

n. Provide shall include provide, complete in place, that is furnish, install, test and make ready for use.

o. Recyclable Waste Materials shall mean materials removed from the Project site which are required to be diverted to a recycling center rather than an area landfill. Recyclable Waste Materials include asphalt, concrete, brick, concrete block, and rock.

p. Specifications means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work. Except for Sections 1-9 of the Standard Specifications for Public Works Construction ("Greenbook"), current Edition, which are specifically excluded from incorporation into these Contract Documents, the Work shall be done in accordance with the Greenbook, including all current supplements, addenda, and revisions thereof. In the case of conflict between the Greenbook and the Contract Documents, the Contract Documents shall prevail.

q. The Work means the entire improvement planned by District pursuant to the Contract Documents.

r. Work means labor, equipment and materials incorporated in, or to be incorporated in the construction covered by the Contract Documents.

ARTICLE 2. CONTRACT DOCUMENTS

a. **Contract Documents**. The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all.

b. **Interpretations**. The Contract Documents are intended to be fully cooperative and to be complementary. If Contractor observes that any documents are in conflict, the Contractor shall promptly notify the Engineer in writing. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:

1. Change Orders or Work Change Directives
2. Addenda
3. Special Provisions (or Special Conditions)
4. Technical Specifications
5. Plans (Contract Drawings)
6. Contract
7. General Conditions
8. Instructions to Bidders
9. Notice Inviting Bids
10. Contractor's Bid Forms
11. Greenbook (Sections 1-9 excluded)
12. Standard Plans
13. Reference Documents

With reference 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 or Change Order drawings govern over Contract Drawings
4. Contract Drawings govern over Standard Drawings
5. Contract Drawings govern over Shop Drawings

c. **Conflicts in Contract Documents**. Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard shall always apply.

d. **Organization of Contract Documents**. Organization of the Contract Documents into divisions, sections, and articles, and arrangement of drawings shall not control the Contractor in dividing The Work among subcontractors or in establishing the extent of Work to be performed by any trade.

ARTICLE 3. CONTRACTS DOCUMENTS: COPIES & MAINTENANCE

Contractor will be furnished, free of charge, **two** copies of the Contract Documents. Additional copies may be obtained at cost of reproduction.

Contractor shall maintain a clean, undamaged set of Contract Documents at the Project site.

ARTICLE 4. DETAIL DRAWINGS AND INSTRUCTIONS

a. **Examination of Contract Documents.** Before commencing any portion of The Work, Contractor shall again carefully examine all applicable Contract Documents, the Project site and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall immediately notify the Engineer of any potential error, inconsistency, ambiguity, conflict or lack of detail or explanation. If Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.

b. **Additional Instructions.** After notification of any error, inconsistency, ambiguity, conflict or lack of detail or explanation, the Engineer will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of Work.

c. **Quality of Parts, Construction and Finish.** All parts of The Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish. In no case shall Contractor proceed with The Work without obtaining first from the Engineer such Approval may be necessary for the proper performance of Work.

d. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all applicable laws, ordinances, rules and regulations, the Engineer may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

ARTICLE 5. EXISTENCE OF UTILITIES AT THE WORK SITE

a. District has endeavored to determine the existence of utilities at the Project site from the records of the owners of known utilities in the vicinity of the Project. The positions of these utilities as derived from such records are shown on the Plans.

b. No excavations were made to verify the locations shown for underground utilities. The service connections to these utilities are not shown on the plans. It shall be the responsibility of the Contractor to determine the exact location of all service connections. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of service connections, prior to commencing Work which could result in damage to such utilities. The Contractor shall immediately notify District in writing of any utility discovered in a different position than shown on the Plans or which is not shown on the Plans.

c. All water meters, water valves, fire hydrants, electrical utility vaults, telephone vaults, gas utility valves, and other subsurface structures shall be relocated or adjusted to final grade by the Contractor. Locations of existing utilities shown on the Plans are approximate and may not be complete. The Contractor shall be responsible for coordinating its Work with all utility companies during the construction of The Work.

d. Notwithstanding the above, pursuant to Section 4215 of the Government Code, District has the responsibility to identify, with reasonable accuracy, main or trunkline facilities on the plans and specifications. In the event that main or trunkline utility facilities are not identified with reasonable accuracy in the plans and specifications made a part of the invitation for bids, District shall assume the responsibility for their timely removal, relocation, or protection.

e. Contractor, except in an emergency, shall contact the appropriate regional notification center, Southern California Underground Service Alert at 1-800-227-2600 at least two working days prior to commencing any excavation if the excavation will be performed in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced or carried out by the Contractor unless such an inquiry identification number has been assigned to the Contractor or any subcontractor of the Contractor and District has been given the identification number by the Contractor.

ARTICLE 6. SCHEDULE

a. **Estimated Schedule.** Within fourteen (14) days after the issuance of the Notice to Proceed, Contractor shall prepare a Project schedule and shall submit this to the Engineer for Approval. The receipt or Approval of any schedules by the Engineer or District shall not in any way relieve the Contractor of its obligations under the Contract Documents. The Contractor is fully responsible to determine and provide for any and all staffing and resources at levels which allow for good quality and timely completion of the Project. Contractor's failure to incorporate all elements of Work required for the performance of the Contract or any inaccuracy in the schedule shall not excuse the Contractor from performing all Work required for a completed Project within the specified Contract time period. If the required schedule is not received by the time the first payment under the

Contract is due, Contractor shall not be paid until the schedule is received, reviewed and accepted by the Engineer.

b. **Schedule Contents.** The schedule shall allow enough time for inclement weather. The schedule shall indicate the beginning and completion dates of all phases of construction; critical path for all critical, sequential time related activities; and "float time" for all "slack" or "gaps" in the non-critical activities. The schedule shall clearly identify all staffing and other resources which in the Contractor's judgment are needed to complete the Project within the time specified for completion. Schedule duration shall match the Contract time. Schedules indicating early completion will be rejected.

c. **Schedule Updates.** Contractor shall continuously update its construction schedule. Contractor shall submit an updated and accurate construction schedule to the Engineer whenever requested to do so by Engineer and with each progress payment request. The Engineer may withhold progress payments or other amounts due under the Contract Documents if Contractor fails to submit an updated and accurate construction schedule.

ARTICLE 7. SUBSTITUTIONS

a. Pursuant to Public Contract Code Section 3400(b) District may make a finding that is described in the invitation for bids that designates certain products, things, or services by specific brand or trade name.

b. Unless specifically designated in the Contract Documents, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such Specifications shall be deemed to be used for the purpose of facilitating the description of the material, process or article desired and shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer for substitution any material, process or article which shall be substantially equal or better in every respect to that so indicated or specified in the Contract Documents. However, District may have adopted certain uniform standards for certain materials, processes and articles.

c. Contractor shall submit requests, together with substantiating data, for substitution of any "or equal" material, process or article no later than thirty-five (35) days after award of the Contract. To facilitate the construction schedule and sequencing, some requests may need to be submitted before thirty-five (35) days after award of Contract. Provisions regarding submission of "or equal" requests shall not in any way authorize an extension of time for performance of this Contract. If a proposed "or equal" substitution request is rejected, Contractor shall be responsible for providing the specified material, process or article. The burden of proof as to the equality of any material, process or article shall rest with the Contractor. District has the complete and sole discretion to determine if a material, process or article is an "or equal" material, process or article that may be substituted.

d. Data required to substantiate requests for substitutions of an "or equal" material, process or article data shall include a signed affidavit from the Contractor stating that, and describing how, the substituted "or equal" material, process or article is equivalent to that specified in every way except as listed on the affidavit. Substantiating data shall include any and all illustrations, specifications, and other relevant data including catalog

information which describes the requested substituted “or equal” material, process or article, and substantiates that it is an “or equal” to the material, process or article. The substantiating data must also include information regarding the durability and lifecycle cost of the requested substituted “or equal” material, process or article. Failure to submit all the required substantiating data, including the signed affidavit, to District in a timely fashion will result in the rejection of the proposed substitution.

e. The Contractor shall bear all of District’s costs associated with the review of substitution requests.

f. The Contractor shall be responsible for all costs related to a substituted “or equal” material, process or article.

g. Contractor is directed to the Special Conditions (if any) to review any findings made pursuant to Public Contract Code section 3400.

ARTICLE 8. SHOP DRAWINGS

a. Contractor shall check and verify all field measurements and shall submit with such promptness as to provide adequate time for review and cause no delay in his own Work or in that of any other contractor, subcontractor, or worker on the Project, six (6) copies of all shop or setting drawings, calculations, schedules, and materials list, and all other provisions required by the Contract. Contractor shall sign all submittals affirming that submittals have been reviewed and approved by Contractor prior to submission to Engineer. Each signed submittal shall affirm that the submittal meets all the requirements of the Contract Documents except as specifically and clearly noted and listed on the cover sheet of the submittal.

b. Contractor shall make any corrections required by the Engineer, and file with the Engineer six (6) corrected copies each, and furnish such other copies as may be needed for completion of the Work. Engineer’s approval of shop drawings shall not relieve Contractor from responsibility for deviations from the Contract Documents unless Contractor has, in writing, called Engineer’s attention to such deviations at time of submission and has secured the Engineer’s written Approval. Engineer’s Approval of shop drawings shall not relieve Contractor from responsibility for errors in shop drawings.

ARTICLE 9. SUBMITTALS

a. Contractor shall furnish to the Engineer for approval, prior to purchasing or commencing any Work, a log of all samples, material lists and certifications, mix designs, schedules, and other submittals, as required in the specifications. The log shall indicate whether samples will be provided in accordance with other provisions of this Contract.

b. Contractor will provide samples and submittals, together with catalogs and supporting data required by the Engineer, to the Engineer within a reasonable time period to provide for adequate review and avoid delays in the Work.

c. These requirements shall not authorize any extension of time for performance of this Contract. Engineer will check and approve such samples, but only for conformance with

design concept of work and for compliance with information given in the Contract Documents. Work shall be in accordance with approved samples and submittals.

ARTICLE 10. MATERIALS

a. Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within specified time.

b. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted and/or specified, and workmanship shall be of good quality.

c. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of The Work and shall be stored properly and protected as required by the Contract Documents. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work.

d. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the Project, to District free from any claims, liens, or charges.

e. Materials shall be stored on the Project site in such manner so as not to interfere with any operations of District or any independent contractor.

ARTICLE 11. CONTRACTOR'S SUPERVISION

Contractor shall continuously keep at the Project site, a competent and experienced full-time Project superintendent approved by District. Superintendent must be able to proficiently speak, read and write in English. Contractor shall continuously provide efficient supervision of the Project.

ARTICLE 12. WORKERS

a. Contractor shall at all times enforce strict discipline and good order among its employees. Contractor shall not employ on the Project any unfit person or any one not skilled in the Work assigned to him or her.

b. Any person in the employ of the Contractor whom District may deem incompetent or unfit shall be dismissed from The Work and shall not be employed on this Project except with the written Approval of District.

ARTICLE 13. SUBCONTRACTORS

a. Contractor agrees to bind every subcontractor to the terms of the Contract Documents as far as such terms are applicable to subcontractor's portion of The Work. Contractor shall be as fully responsible to District for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as Contractor is for

acts and omissions of persons directly employed by Contractor. Nothing contained in these Contract Documents shall create any contractual relationship between any subcontractor and District.

b. District reserves the right to Approve all subcontractors. District's Approval of any subcontractor under this Contract shall not in any way relieve Contractor of its obligations in the Contract Documents.

c. Prior to substituting any subcontractor listed in the Bid Forms, Contractor must comply with the requirements of the Subletting and Subcontracting Fair Practices Act pursuant to California Public Contract Code section 4100 et seq.

ARTICLE 14. PERMITS AND LICENSES

Permits and licenses necessary for prosecution of The Work shall be secured and paid for by Contractor, unless otherwise specified in the Contract Documents.

a. Contractor shall obtain and pay for all other permits and licenses required for The Work, including excavation permit and for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under jurisdiction of public agencies other than District.

b. The Contractor shall arrange and pay for all off-site inspection of the Work related to permits and licenses, including certification, required by the specifications, drawings, or by governing authorities, except for such off-site inspections delineated as District's responsibility pursuant to the Contract Documents.

c. Before Acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to District.

ARTICLE 15. UTILITY USAGE

a. All temporary utilities, including but not limited to electricity, water, gas, and telephone, used on the Work shall be furnished and paid for by Contractor. Contractor shall Provide necessary temporary distribution systems, including meters, if necessary, from distribution points to points on The Work where the utility is needed. Upon completion of The Work, Contractor shall remove all temporary distribution systems.

b. Contractor shall provide necessary and adequate utilities and pay all costs for water, electricity, gas, oil, and sewer charges required for completion of the Project.

c. All permanent meters Installed shall be listed in the Contractor's name until Project Acceptance.

d. If the Contract is for construction in existing facilities, Contractor may, with prior written Approval of District, use District's existing utilities by compensating District for utilities used by Contractor.

ARTICLE 16. INSPECTION FEES FOR PERMANENT UTILITIES

All inspection fees and other municipal charges for permanent utilities including, but not limited to, sewer, electrical, phone, gas, water, and irrigation shall be paid for by District. Contractor shall be responsible for arranging the payment of such fees, but inspection fees and other municipal fees relating to permanent utilities shall be paid by District. Contractor may either request reimbursement from District for such fees, or shall be responsible for arranging and coordination with District for the payment of such fees.

ARTICLE 17. TRENCHES

a. Trenches Five Feet or More in Depth. The Contractor shall submit to District, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches five feet or more in depth. If the plan varies from shoring system standards, the plan shall be prepared by a registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations.

b. Excavations Deeper than Four Feet. If work under this Contract involves digging trenches or other excavation that extends deeper than four feet below the surface, Contractor shall promptly, and before the following conditions are disturbed, notify 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.

District shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of The Work, shall issue a change order under the procedures described in the Contract Documents.

In the event that a dispute arises between District and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of The Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the parties.

ARTICLE 18. DIVERSION OF RECYCLABLE WASTE MATERIALS

In compliance with the applicable District's waste reduction and recycling efforts, Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers. Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress payment requests. Contractor shall complete and execute any certification forms required by District or other applicable agencies to document Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor.

ARTICLE 19. REMOVAL OF HAZARDOUS MATERIALS

Should Contractor encounter material reasonably believed to be polychlorinated biphenyl (PCB) or other toxic wastes and hazardous materials which have not been rendered harmless at the Project site, the Contractor shall immediately stop work at the affected Project site and shall report the condition to District in writing. District shall contract for any services required to directly remove and/or abate PCBs and other toxic wastes and hazardous materials, if required by the Project site(s), and shall not require the Contractor to subcontract for such services. The Work in the affected area shall not thereafter be resumed except by written agreement of District and Contractor.

ARTICLE 20. SANITARY FACILITIES

Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with all applicable federal, state and local laws, codes, ordinances, and regulations. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in The Work under construction shall not be permitted. Any other Sanitary Facilities required by CAL-OSHA shall be the responsibility of the Contractor.

ARTICLE 21. AIR POLLUTION CONTROL

Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements.

ARTICLE 22. COMPLIANCE WITH STATE STORM WATER PERMIT

a. Contractor shall be required to keep itself and all subcontractors, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the Work including, without limitation, all applicable provisions of local ordinances regulating discharges of storm water; the Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq.*); the California Porter-Cologne Water Quality Control Act (Water Code § 13000 *et seq.*); and any and all regulations, policies, or permits issued pursuant to any such authority. These include, but are not limited to California Regional Water Quality Control Board, San Diego Region, Order No. R9-2013-0001, as amended by R9-2015-0001, NPDES Order No. CAS0109266 and the State Water Resources Control Board (State Board) Water Quality Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity (Permit or CGP) and any amendment, renewal or reissuance thereof, for all projects that involve

construction on or disturbance of one acre or more of land or which are part of a larger common plan of development or sale.

b. Contractor shall be responsible for filing the Notice of Intent and for obtaining coverage under and complying with the Permit. Contractor shall be solely responsible for preparing and implementing a Storm Water Pollution Prevention Plan ("SWPPP") prior to initiating Work, revising the SWPPP as required by working conditions and coordinating all submittals with the District's Legally Responsible Person and/or Authorized Signatory, as those terms are defined in the Permit. The District reserves the right to review all SWPPPs to determine the adequacy of the document and to require any necessary corrections prior to uploading the SWPPP to the State's SMARTS database.

c. The District retains the right to procure coverage under the Permit for the Project site if the Contractor fails to draft a satisfactory NOI or SWPPP or proceed in a manner that is satisfactory to the District. Any costs incurred by the District in procuring coverage under the Permit, or drafting an NOI or SWPPP shall be paid by the Contractor.

d. In bidding on this Contract, it shall be Contractor's responsibility to evaluate the cost of procuring the Permit and preparing the SWPPP as well as complying with the SWPPP and any necessary revision to the SWPPP, including the cost of hiring a Qualified SWPPP Developer to prepare a SWPPP, Erosion/Sediment Control Plan sheets acceptable to the District, and the cost of hiring a Qualified SWPPP Practitioner to inspect the project and document each inspection. Contractor shall comply with all requirements of the State Water Resources Control Board. Contractor shall include all costs of compliance with specified requirements in the Contract amount.

e. Contractor shall be responsible for procuring, implementing and maintaining compliance with the Permit and the SWPPP, including the standard provisions, monitoring and reporting requirements as required by the Permit. Contractor shall provide copies of all reports and monitoring information to the Engineer. If the Contractor has failed or is unable to maintain compliance with the Permit, the District reserves the right to implement the approved SWPPP at the Project site, and hire additional contractors to maintain compliance. Whether Contractor has adequately maintained compliance with the Permit shall be the District's sole determination. In the event that Contractor has failed or is unable to maintain compliance with the Permit, any costs incurred by the District in implementing the approved SWPPP, or otherwise maintaining compliance with the Permit shall be paid by the Contractor.

f. Contractor shall comply with the lawful requirements of any applicable municipality, District, drainage district, and other local agencies regarding discharges of storm water to separate storm drain system or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.

g. Storm, surface, nuisance, or other waters may be encountered at various times during construction of The Work. Therefore, the Contractor, by submitting a Bid, hereby acknowledges that it has investigated the risk arising from such waters, has prepared its Bid accordingly, and assumes any and all risks and liabilities arising therefrom.

h. Failure to comply with the Permit is in violation of federal and state law. Contractor hereby agrees to indemnify and hold harmless District, its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which District, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the sole established negligence, willful misconduct or active negligence of District, its officials, officers, agents, employees or authorized volunteers. District may seek damages from Contractor for delay in completing the Contract in accordance with the Contract Documents, caused by Contractor's failure to comply with the laws, regulations and policies described in this Article, or any other relevant water quality law, regulation, or policy.

i. The District reserves the right to defend any enforcement action or civil action brought against the District for Contractor's failure to comply with any applicable water quality law, regulation, or policy. Contractor hereby agrees to be bound by, and to reimburse the District for the costs associated with, any settlement reached between the District and any relevant enforcement entity.

ARTICLE 23. CLEANING UP

a. Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment. Contractor shall not store debris under, in, or about the premises. Upon completion of Work, Contractor shall clean the interior and exterior of the building or improvement including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected so surfaces are free from foreign material or discoloration. Contractor shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and contractor shall also remove temporary fencing, barricades, planking and construction toilet and similar temporary facilities from site. Contractor shall also clean all buildings, asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by Contractor operations or equipment.

b. Contractor shall fully clean up the site at the completion of The Work. If the Contractor fails to immediately clean up at the completion of The Work, District may do so and the cost of such clean up shall be charged back to the Contractor.

ARTICLE 24. LAYOUT AND FIELD ENGINEERING

All field engineering required for laying out The Work and establishing grades for earthwork operations shall be furnished by the Contractor at its expense. Layout shall be done by a registered civil engineer Approved by the Engineer. Any required "as-built" drawings of the Work shall be prepared by the registered civil engineer.

ARTICLE 25. EXCESSIVE NOISE

a. The Contractor shall use only such equipment on the work and in such state of repair so that the emission of sound therefrom is within the noise tolerance level of that equipment as established by CAL-OSHA.

b. The Contractor shall comply with the most restrictive of the following: (1) local sound control and noise level rules, regulations and ordinances and (2) the requirements contained in these Contract Documents, including hours of operation requirements. No internal combustion engine shall be operated on the Project without a muffler of the type recommended by the manufacturer. Should any muffler or other control device sustain damage or be determined to be ineffective or defective, the Contractor shall promptly remove the equipment and shall not return said equipment to the job until the device is repaired or replaced. Said noise and vibration level requirements shall apply to all equipment on the job or related to the job, including but not limited to, trucks, transit mixers or transit equipment that may or may not be owned by the Contractor.

ARTICLE 26. TESTS AND INSPECTIONS

a. If the Contract Documents, the Engineer, or any instructions, laws, ordinances, or public authority require any part of The Work to be tested or Approved, Contractor shall provide the Engineer at least two (2) working days' notice of its readiness for observation or inspection. If inspection is by a public authority other than District, Contractor shall promptly inform District of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by Contractor. Costs for District testing and District inspection shall be paid by District. Costs of tests for Work found not to be in compliance shall be paid by the Contractor.

b. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone after completion of the testing at the Contractor's cost in compliance with the Contract Documents.

c. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by District, and not by Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.

d. In advance of manufacture of materials to be supplied by Contractor which must be tested or inspected, Contractor shall notify District so that District may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into The Work.

e. If the manufacture of materials to be inspected or tested will occur in a plant or location outside the geographic limits of District, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.

f. Reexamination of Work may be ordered by District. If so ordered, Work must be uncovered or deconstructed by Contractor. If Work is found to be in accordance with the Contract Documents, District shall pay the costs of reexamination and reconstruction. If such work is found not to be in accordance with the Contract Documents, Contractor shall pay all costs.

ARTICLE 27. PROTECTION OF WORK AND PROPERTY

a. The Contractor shall be responsible for all damages to persons or property that occur as a result of The Work. Contractor shall be responsible for the proper care and protection of all materials delivered and Work performed until completion and final Acceptance by District. All Work shall be solely at the Contractor's risk. Contractor shall adequately protect adjacent property from settlement or loss of lateral support as necessary. Contractor shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Project site where Work is being performed. Contractor shall erect and properly maintain at all times, as required by field conditions and progress of work, all necessary safeguards, signs, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created in the course of construction.

b. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act to prevent such threatened loss or injury; and Contractor shall so act, without appeal, if so authorized or instructed by the Engineer or District. Any compensation claimed by Contractor on account of emergency work shall be determined by and agreed upon by District and the Contractor.

c. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions.

d. Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, and other adjoining property and structures, and to avoid damage thereto, and Contractor shall repair any damage thereto caused by The Work operations. Contractor shall:

    1) Enclose the working area with a substantial barricade, and arrange work to cause minimum amount of inconvenience and danger to the public.

    2) Provide substantial barricades around any shrubs or trees indicated to be preserved.

    3) Deliver materials to the Project site over a route designated by the Engineer.

    4) Provide any and all dust control required and follow the Applicable air quality regulations as appropriate. If the Contractor does not comply, District shall have the immediate authority to provide dust control and deduct the cost from payments to the Contractor.

    5) Confine Contractor's apparatus, the storage of materials, and the operations of its workers to limits required by law, ordinances, permits, or directions of the Engineer. Contractor shall not unreasonably encumber the Project site with its materials.

    6) Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved civil engineer or land surveyor, at no cost to District.

7) Ensure that existing facilities, fences and other structures are all adequately protected and that, upon completion of all Work, all facilities that may have been damaged are restored to a condition acceptable to District.

8) Preserve and protect from injury all buildings, pole lines and all direction, warning and mileage signs that have been placed within the right-of-way.

9) At the completion of work each day, leave the Project site in a clean, safe condition.

10) Comply with any stage construction and traffic handling plans. Access to residences and businesses shall be maintained at all times.

e. These precautionary measures will apply continuously and not be limited to normal working hours. Full compensation for the Work involved in the preservation of life, safety and property as above specified shall be considered as included in the prices paid for the various contract items of Work, and no additional allowance will be made thereto.

f. Should damage to persons or property occur as a result of The Work, Contractor shall be responsible for proper investigation, documentation, including video or photography, to adequately memorialize and make a record of what transpired. District shall be entitled to inspect and copy any such documentation, video, or photographs.

ARTICLE 28. CONTRACTORS MEANS AND METHODS

Contractor is solely responsible for the means and methods utilized to Perform The Work. In no case shall the Contractor's means and methods deviate from commonly used industry standards.

ARTICLE 29. AUTHORIZED REPRESENTATIVES

District shall designate representatives, who shall have the right to be present at the Project site at all times. District may designate an inspector who shall have the right to observe all of the Contractor's Work. The inspector is not authorized to make changes in the Contract Documents. The inspector shall not be responsible for the Contractor's failure to carry out The Work in accordance with the Contract Documents. Contractor shall provide safe and proper facilities for such access.

ARTICLE 30. HOURS OF WORK

a. Eight (8) hours of work shall constitute a legal day's work. The Contractor and each subcontractor shall forfeit, as penalty to District, twenty-five dollars ($25) for each worker employed in the execution of Work by the Contractor or any subcontractor for each day during which such worker is required or permitted to work more than eight (8) hours in any one day and forty (40) hours in any week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, except as provided in Labor Code Section 1815.

b. Work shall be accomplished on a regularly scheduled eight (8) hour per day work shift basis, Monday through Friday, between the hours of 7:00 a.m. and 5:00 p.m.

c. It shall be unlawful for any person to operate, permit, use, or cause to operate any of the following at the Project site, other than between the hours of 7:00 a.m. to 5:00 p.m.,

Monday through Friday, with no Work allowed on District-observed holidays, unless otherwise Approved by the Engineer:

1) Powered Vehicles
2) Construction Equipment
3) Loading and Unloading Vehicles
4) Domestic Power Tool.

ARTICLE 31. PAYROLL RECORDS

a. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall maintain weekly certified payroll records showing the name, address, social security number, work classification, straight time and overtime hours paid each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the work. Contractor shall certify under penalty of perjury that records maintained and submitted by Contractor are true and accurate. Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.

b. In accordance with Labor Code section 1771.4, the Contractor and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations ("DIR") on a weekly basis and in the format prescribed by the DIR, which may include electronic submission. Contractor shall comply with all requirements and regulations from the DIR relating to labor compliance monitoring and enforcement.

c. The payroll records described herein shall be certified and submitted by the Contractor at a time designated by District. The Contractor shall also provide the following:

1) A certified copy of the employee's payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.

2) A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the DIR.

d. Unless submitted electronically, the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement ("DLSE") of the DIR or shall contain the same information as the forms provided by the DLSE.

e. Any copy of records made available for inspection and furnished upon request to the public shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor or any subcontractor shall not be marked or obliterated.

f. In the event of noncompliance with the requirements of this Section, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying any item or actions necessary to ensure compliance with this section. Should noncompliance still be evident after such ten (10) day period, the Contractor shall, as a penalty to District, forfeit One Hundred Dollars ($100.00) for each day, or portion thereof,

for each worker until strict compliance is effectuated. Upon the request of the DIR, such penalties shall be withheld from contract payments.

ARTICLE 32. PREVAILING RATES OF WAGES

a. The Contractor is aware of the requirements of Labor Code Sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. Since this Project involves an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and since the total compensation is $1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov/dlsr/. In the alternative, the Contractor may view a copy of the prevailing rates of per diem wages at District. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. Contractor shall defend, indemnify and hold District, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.

b. The Contractor and each subcontractor shall forfeit as a penalty to District not more than Two Hundred Dollars ($200) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him, or by any subcontract under him, in violation of the provisions of the Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

c. Contractor shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

ARTICLE 33. EMPLOYMENT OF APPRENTICES

The Contractor's attention is directed to the provisions of Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning employment of apprentices by the Contractor or any subcontractor. The Contractor shall obtain a certificate of apprenticeship before employing any apprentice pursuant to Section 1777.5, 1777.6, and 1777.7 of the Labor Code. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, the Administrator of Apprenticeships, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

ARTICLE 34. NONDISCRIMINATION/EQUAL EMPLOYMENT OPPORTUNITY

Pursuant to Labor Code Section 1735 and other applicable provisions of law, the Contractor and its subcontractors shall not discriminate against any employee or applicant for employment

because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap on this Project. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

ARTICLE 35. LABOR/EMPLOYMENT SAFETY

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4.

ARTICLE 36. WORKERS' COMPENSATION INSURANCE

The Contractor shall Provide, during the life of this Contract, workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Project site, and, in case any of sublet Work, the Contractor shall require each subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by State law. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Project site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to its employees in accordance with the provisions of Section 3700 of the Labor Code. The Contractor shall file with District certificates of its insurance protecting workers. Company or companies providing insurance coverage shall be acceptable to District, if in the form and coverage as set forth in the Contract Documents.

Contractor shall assume the immediate defense of and indemnify and save harmless the District, and its officers, and employees, agents and consultants from all claims, loss, damage, injury, and liability of every kind, nature, and description brought by any person employed or used by Contractor, or any subcontractor, to perform Work under this contract regardless of responsibility or negligence.

ARTICLE 37. EMPLOYER'S LIABILITY INSURANCE

Contractor shall provide during the life of this Contract, Employer's Liability Insurance, including Occupational Disease, in the amount of, at least, one million dollars ($1,000,000.00) per person per accident. Contractor shall provide District with a certificate of Employer's Liability Insurance. Such insurance shall comply with the provisions of the Contract Documents. The policy shall be endorsed, if applicable, to provide a Borrowed Servant/Alternate Employer Endorsement and contain a Waiver of Subrogation in favor of District.

ARTICLE 38. COMMERCIAL GENERAL LIABILITY INSURANCE

a. Contractor shall procure and maintain during the life of this Contract and for such other period as may be required herein, at its sole expense, Commercial General Liability insurance coverage at least as broad as the most current ISO Commercial General Liability Coverage (Occurrence Form CG 00 01), including but not limited to, all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, products/completed operations liability, explosion,

collapse, under-ground excavation, removal of lateral support, and other covered loss, premises liability, and personal and advertising injury – which may arise from or out of Contractor's operations, use, and management of the Project site, or the performance of its obligations hereunder. The policy shall not contain any exclusion contrary to this Contract including but not limited to endorsements or provisions limiting coverage for (1) contractual liability (including but not limited to ISO CG 24 26 or 21 39); or cross liability for claims or suits against one insured against another. Policy limits shall not be less than $5,000,000 per occurrence or the full per occurrence limits of the policies available, whichever is greater for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit or products-completed operations aggregate limit is used, either the general aggregate limit shall apply separately to this project/location (with the ISO CG 2503, or ISO CG 2504, or insurer's equivalent endorsement provided to the District) or the general aggregate limit shall be twice the required occurrence limit.

b. Such policy shall comply with all the requirements of this Article. The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit Contractor's indemnification obligations to District, and shall not preclude District from taking such other actions available to District under other provisions of the Contract Documents or law.

c. Contractor shall make certain that any and all subcontractors hired by Contractor are insured in accordance with this Contract. If any subcontractor's coverage does not comply with the foregoing provisions, Contractor shall indemnify and hold District harmless from any damage, loss, cost, or expense, including attorneys' fees, incurred by District as a result thereof.

d. All general liability policies provided pursuant to the provisions of this Article shall comply with the provisions of the Contract Documents including the requirements of ARTICLE 41 below.

e. All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, under-ground excavation, removal of lateral support, premises liability, and personal and advertising injury, and other covered loss, however occasioned, occurring during the policy term, and shall specifically insure the performance by Contractor of that part of the indemnification contained in these General Conditions, relating to liability for injury to or death of persons and damage to property. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, District may require additional coverage to be purchased by Contractor to restore the required limits. Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement described in the Contract Documents. Additionally, all policies of general liability insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss.

ARTICLE 39. AUTOMOBILE LIABILITY INSURANCE

Contractor shall take out and maintain at all times during the term of this Contract Automobile Liability Insurance at least as broad as ISO CA 00 01 (covering Symbol 1—Any Auto) in the amount of, at least, one million dollars ($1,000,000) per accident. Such insurance shall provide coverage for bodily injury and property damage including coverage with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, non-owned, leased, hired or borrowed by Contractor or for which Contractor is responsible, in a form and with insurance companies acceptable to District. All policies of automobile insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Such insurance shall comply with the provisions of ARTICLE 41 below.

ARTICLE 40. BUILDER'S RISK ["ALL RISK"]

a. It is the Contractor's responsibility to maintain or cause to be maintained Builder's Risk ["All Risk"] extended coverage insurance covering risks of direct physical loss, damage or destruction to all work, material, equipment, appliances, tools, and structures which are a part of the Contract and subject to loss or damage by fire, and extended coverage, theft, vandalism and malicious mischief, and collapse in an amount to cover 100% of the replacement cost. . The making of progress payments to the Contractor shall not be construed as creating an insurable interest by or for the District or be construed as relieving the Contractor or its subcontractors of responsibility for loss from any direct physical loss, damage or destruction occurring prior to final acceptance of The Work by the District. The Contractor is required to file with District a certificate evidencing fire insurance coverage.

b. Provide insurance coverage on completed value form, all-risk or special causes of loss coverage.

   1) Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.

   2) Coverage shall include all materials stored on site and in transit.

   3) Coverage shall include Contractor's tools and equipment.

   4) Insurance shall include boiler, machinery and material hoist coverage.

   5) Such insurance shall comply with the provisions of the Contract Documents.

ARTICLE 41. FORM AND PROOF OF CARRIAGE OF INSURANCE

a. Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by District's Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A-:VII. Insurance deductibles or self-insured retentions must be declared by the Contractor, and such deductibles and retentions shall have the prior written consent from District. At the election of District the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses. If umbrella or excess liability coverage is used to meet any required limit(s) specified

herein, the Contractor shall provide a "follow form" endorsement satisfactory to the District indicating that such coverage is subject to the same terms and conditions as the underlying liability policy.

b. Each insurance policy required by this Contract shall be endorsed to state that: (1) coverage shall not be suspended, voided, reduced or cancelled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District; and (2) any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the District its directors, officials, officers, employees, agents, representatives and authorized volunteers.

c. The District, its directors, officers, employees, agents, representatives and authorized volunteers are to be given insured status (via ISO endorsement at least as broad as CG 2010 1185 or both CG 20 37 and CG 20 38 04 13 forms (if later revisions used) or endorsements providing the exact same coverage) on the Contractor's Builder's Risk ["All Risk"] policy and on all Contractor's policies of Commercial General Liability and Automobile Liability insurance, and on Contractor's subcontractors' policies of Commercial General Liability insurance (via ISO CG form 20 38 (or endorsements providing the exact same coverage). The coverage shall contain no special limitations on the scope of protection afforded to the District, its directors officers, employees, agents, representatives and/or authorized volunteers. Notwithstanding the minimum limits set forth in this Contract for any type of insurance coverage, all available insurance proceeds in excess of the specified minimum limits of coverage shall be available to the parties required to be named as Additional Insureds hereunder. Contractor and its insurance carriers shall provide a Waiver of Subrogation in favor of those parties.

d. Contractor shall cause its insurance carrier(s) to furnish District with either 1) a properly executed original Certificates(s) of Insurance and certified original copies of Endorsements effecting coverage as required herein, or 2) if requested to do so in writing by District's Risk Manager, provide original Certified copies of policies including all Endorsements and all attachments thereto, showing such insurance is in full force and effect, In the event of a material modification or cancellation of coverage, District may terminate or Stop Work pursuant to the Contract Documents, unless District receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverages set forth herein and the insurance required herein is in full force and effect. Contractor shall not take possession, or use the Project site, or commence operations under this Agreement until District has been furnished original Certificate(s) of Insurance and certified original copies of Endorsements or policies of insurance including all Endorsements and any and all other attachments as required in this Section. The original Endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.

e. It is understood and agreed to by the parties hereto and the insurance company(s), that the Certificate(s) of Insurance and policies and endorsements shall so covenant and shall be construed as primary, and District's insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory (as broad as ISO endorsement CG 20 01). Additionally, it is understood and agreed to by the parties

hereto and the insurance company(s) that the Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

f. District reserves the right to adjust the monetary limits of insurance coverages during the term of this Contract including any extension thereof, if in District's reasonable judgment, the amount or type of insurance carried by the Contractor becomes inadequate.

g. Contractor shall pass down the insurance obligations contained herein to all tiers of sub-contractors working under this Contract.

ARTICLE 42. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

a. **Time for Completion/Liquidated Damages.** Work shall be commenced within ten (10) days of the date stated in District's Notice to Proceed and shall be completed by Contractor in the time specified in the Contract Documents. District is under no obligation to consider early completion of the Project; and the Contract completion date shall not be amended by District's receipt or acceptance of the Contractor's proposed earlier completion date. Furthermore, Contractor shall not, under any circumstances, receive additional compensation from District (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the Contractor and the Contract completion date. If The Work is not completed as stated in the Contract Documents, it is understood that District will suffer damage. In accordance with Government Code section 53069.85, being impractical and infeasible to determine the amount of actual damage, it is agreed that Contractor shall pay to District as fixed and liquidated damages, and not as a penalty, the sum stipulated in the Contract for each day of delay until The Work is fully completed. Contractor and its surety shall be liable for any liquidated damages. Any money due or to become due the Contractor may be retained to cover liquidated damages.

b. **Inclement Weather.** Contractor shall abide the Engineer's determination of what constitutes inclement weather. Time extensions for inclement weather shall only be granted when the Work stopped during inclement weather is on the critical path of the Project schedule.

c. **Extension of Time.** Contractor shall not be charged liquidated damages because of any delays in completion of The Work due to unforeseeable causes beyond the control and without the fault or negligence of Contractor (or its subcontractors or suppliers). Contractor shall within five (5) Days of identifying any such delay notify District in writing of causes of delay. District shall ascertain the facts and extent of delay and grant extension of time for completing The Work when, in its judgment, the facts justify such an extension. Time extensions to the Project shall be requested by the Contractor as they occur and without delay. No delay claims shall be permitted unless the event or occurrence delays the completion of the Project beyond the Contract completion date.

d. **No Damages for Reasonable Delay.** District's liability to Contractor for delays for which District is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall District be liable for any costs which are borne by the Contractor in the regular course of business, including, but not

limited to, home office overhead and other ongoing costs. Damages caused by unreasonable District delay, including delays caused by items that are the responsibility of District pursuant to Government Code section 4215, shall be based on actual costs only, no proportions or formulas shall be used to calculate any delay damages.

ARTICLE 43. COST BREAKDOWN AND PERIODIC ESTIMATES

Contractor shall furnish on forms Approved by District:

a. Within ten (10) Days of award of the Contract a detailed estimate giving a complete breakdown of the Contract price;

b. A monthly itemized estimate of Work done for the purpose of making progress payments. In order for District to consider and evaluate each progress payment application, the Contractor shall submit a detailed measurement of Work performed and a progress estimate of the value thereof before the tenth (10th) Day of the following month.

c. Contractor shall submit, with each of its payment requests, an adjusted list of actual quantities, verified by the Engineer, for unit price items listed, if any, in the Bid Form.

d. Following District's Acceptance of the Work, the Contractor shall submit to District a written statement of the final quantities of unit price items for inclusion in the final payment request.

e. District shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any estimate for payment.

Contractor shall certify under penalty of perjury, that all cost breakdowns and periodic estimates accurately reflect the Work on the Project.

ARTICLE 44. MOBILIZATION

a. When a bid item is included in the Bid Form for mobilization, the costs of Work in advance of construction operations and not directly attributable to any specific bid item will be included in the progress estimate ("Initial Mobilization"). When no bid item is provided for "Initial Mobilization," payment for such costs will be deemed to be included in the other items of The Work.

b. Payment for Initial Mobilization based on the lump sum provided in the Bid Form, which shall constitute full compensation for all such Work. No payment for Initial Mobilization will be made until all of the listed items have been completed to the satisfaction of the Engineer. The scope of the Work included under Initial Mobilization shall include, but shall not be limited to, the following principal items:

   1) Obtaining and paying for all bonds, insurance, and permits.

   2) Moving on to the Project site of all Contractor's plant and equipment required for first month's operations.

   3) Installing temporary construction power, wiring, and lighting facilities.

   4) Establishing fire protection system.

5) Developing and installing a construction water supply.

6) Providing and maintaining the field office trailers for the Contractor and the Engineer, complete, with all specified furnishings and utility services including telephones, telephone appurtenances, computer and printer, and copying machine.

7) Providing on-site communication facilities for the Owner and the Engineer, including telephones, radio pagers, and fax machines.

8) Providing on-site sanitary facilities and potable water facilities as specified per Cal-OSHA and these Contract Documents.

9) Furnishing, installing, and maintaining all storage buildings or sheds required for temporary storage of products, equipment, or materials that have not yet been installed in the Work. All such storage shall meet manufacturer's specified storage requirements, and the specific provisions of the specifications, including temperature and humidity control, if recommended by the manufacturer, and for all security.

10) Arranging for and erection of Contractor's work and storage yard.

11) Posting all OSHA required notices and establishment of safety programs per Cal-OSHA.

12) Full-time presence of Contractor's superintendent at the job site as required herein.

13) Submittal of Construction Schedule as required by the Contract Documents.

ARTICLE 45. PAYMENTS

a. District shall make monthly progress payments following receipt of undisputed and properly submitted payment requests. Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of Work performed up to the last day of the previous month, less the aggregate of previous payments. Where the District has adopted a finding that the work done under the Contract is substantially complex, the Contractor shall be paid a sum reduced by the retention specified in the Notice Inviting Bids.

b. The Contractor shall, after the full completion of The Work, submit a final payment application. All prior progress estimates shall be subject to correction in the final estimate and payment.

c. Unless otherwise required by law, the final payment of withheld retention, if unencumbered, shall be paid no later than sixty (60) Days after the date of recordation of the Notice of Completion.

d. Acceptance by Contractor of the final payment shall constitute a waiver of all claims against District arising from this Contract.

e. Payments to the Contractor shall not be construed to be an acceptance of any defective work or improper materials, or to relieve the Contractor of its obligations under the Contract Documents.

f. The Contractor shall submit with each payment request the Contractor's conditional waiver of lien for the entire amount covered by such payment request, as well as a valid unconditional waiver of lien from the Contractor and all subcontractors and materialmen for all work and materials included in any prior invoices. Waivers of lien shall be in the forms prescribed by California Civil Code Section 8132. Prior to final payment by District, the Contractor shall submit a final waiver of lien for the Contractor's work, together with releases of lien from any subcontractor or materialmen.

ARTICLE 46. PAYMENTS WITHHELD AND BACKCHARGES

a. In addition to amounts which District may retain under other provisions of the Contract Documents District may withhold payments due to Contractor as may be necessary to cover:

1) Stop Notice Claims.

2) Defective work not remedied.

3) Failure of Contractor to make proper payments to its subcontractors or suppliers.

4) Completion of the Contract if there exists a reasonable doubt that the work can be completed for balance then unpaid.

5) Damage to another contractor or third party.

6) Amounts which may be due District for claims against Contractor.

7) Failure of Contractor to keep the record ("as-built") drawings up to date.

8) Failure to provide updates on the construction schedule.

9) Site clean up.

10) Failure of the Contractor to comply with requirements of the Contract Documents.

11) Liquated damages.

12) Legally permitted penalties.

b. Upon completion of the Contract, District will reduce the final Contract amount to reflect costs charged to the Contractor, back charges or payments withheld pursuant to the Contract Documents.

ARTICLE 47. CHANGES AND EXTRA WORK

a. Change Order Work.

1) District, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, the Contract amount and Contract time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including any adjustment in the Contract amount or the Contract time, and the full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.

2) All claims for additional compensation to the Contractor shall be presented in writing before the expense is incurred and will be adjusted as provided herein. No work shall be allowed to lag pending such adjustment, but shall be promptly executed as directed, even if a dispute arises. No claim will be considered after the work in question has been done unless a written contract change order has been issued or a timely written notice of claim has been made by Contractor. Contractor shall not be entitled to claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions and provisions of the original Contract.

3) Owner Initiated Change. The Contractor must submit a complete cost proposal, including any change in the Contract time, within seven (7) Days after receipt of a scope of a proposed change order, unless District requests that proposals be submitted in less than seven (7) Days.

4) Contractor Initiated Change. The Contractor must give written notice of a proposed change order required for compliance with the Contract Documents within seven (7) Days of discovery of the facts giving rise to the proposed change order.

5) Whenever possible, any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and District.

6) Price quotations from the Contractor shall be accompanied by sufficiently detailed supporting documentation to permit verification by District.

7) If the Contractor fails to submit the cost proposal within the seven (7) Day period (or as requested), District has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the contract price in accordance with District's estimate of cost. If the change is issued based on District estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following completion of the added/deleted work, the Contractor presents written proof that District's estimate was in error.

8) Estimates for lump sum quotations and accounting for cost-plus-percentage work shall be limited to direct expenditures necessitated specifically by the subject extra work, and shall be segregated as follows:

   (a) Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

(b) Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight and delivery. Materials cost shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of cost are not furnished within fifteen (15) Days of delivery, then the Engineer shall determine the materials cost, at its sole discretion.

(c) Tool and Equipment Use. No payment will be made for the use of small tools, tools which have a replacement value of $1,000 or less. Regardless of ownership, the rates to be used in determining equipment use costs shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the work is performed.

(d) Overhead, Profit and Other Charges. The mark-up for overhead (including supervision) and profit on work added to the Contract shall be according to the following:

i. "Net Cost" is defined as consisting of costs of labor, materials and tools and equipment only excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up.

ii. For Work performed by the Contractor's forces the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work.

iii. For Work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work to which the Contractor may add five (5%) percent of the subcontractor's Net Cost.

iv. For Work performed by a sub-subcontractor the added cost for overhead and profit shall not exceed fifteen (15 %) percent of the Net Cost for Work to which the subcontractor and general contractor may each add an additional five (5 %) percent of the Net Cost of the lower tier subcontractor.

v. No additional mark-up will be allowed for lower tier subcontractors, and in no case shall the added cost for overhead and profit payable by District exceed twenty-five (25%) percent of the Net Cost as defined herein.

9) All of the following costs are included in the markups for overhead and profit described above, and Contractor shall not receive any additional compensation for: Submittals, drawings: field drawings, Shop Drawings, including submissions of drawings; field inspection; general Superintendence; general administration and preparation of cost proposals, schedule analysis, Change Orders, and other supporting documentation; computer services; reproduction services; salaries of project engineer, superintendent, timekeeper, storekeeper, and secretaries; janitorial services; small tools, incidentals and consumables; temporary on-site facilities (offices, telephones, internet access, plumbing, electrical power, lighting; platforms, fencing, water), jobsite and home office overhead or other expenses; vehicles and fuel used for work otherwise included in the Contract Documents;

surveying; estimating; protection of work; handling and disposal fees; final cleanup; other incidental work; related warranties.

10) For added or deducted Work by subcontractors, the Contractor shall furnish to District the subcontractor's signed detailed estimate of the cost of labor, material and equipment, including the subcontractor markup for overhead and profit. The same requirement shall apply to sub-subcontractors.

11) For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to District a detailed estimate or quotation of the cost to the Contractor, signed by such vendor or supplier.

12) Any change in The Work involving both additions and deletions shall indicate a net total cost, including subcontracts and materials. Allowance for overhead and profit, as specified herein, shall be applied if the net total cost is an extra; overhead and profit allowances shall not be applied if the net total cost is a credit. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.

13) Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the change order for work. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify District's change order form in an attempt to reserve additional rights.

14) If District disagrees with the proposal submitted by Contractor, it will notify the Contractor and District will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with District, a change order will be issued by District. If no agreement can be reached, District shall have the right to issue a unilateral change order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to District within fifteen (15) Days of the issuance of the unilateral change order, disputing the terms of the unilateral change order.

15) No dispute, disagreement or failure of the parties to reach agreement on the terms of the change order shall relieve the Contractor from the obligation to proceed with performance of the work, including extra work, promptly and expeditiously.

16) Any alterations, extensions of time, extra work or any other changes may be made without securing consent of the Contractor's surety or sureties.

ARTICLE 48. OCCUPANCY

District reserves the right to occupy or utilize any portion of The Work at any time before completion, and such occupancy or use shall not constitute Acceptance of any part of Work covered by this Contract. This use shall not relieve the Contractor of its responsibilities under the Contract.

ARTICLE 49. INDEMNIFICATION

Contractor shall defend (with counsel of District's Board of Directors' choosing), indemnify and hold District, its officials, officers, agents, employees, and representatives free and harmless from any and all claims, demands, causes of action, costs, expenses, liabilities, losses, damages or injuries, in law or equity, regardless of whether the allegations are false, fraudulent, or groundless, to property or persons, including wrongful death, to the extent arising out of or incident to any acts, omissions or willful misconduct of Contractor, its officials, officers, employees, agents, consultants and contractors arising out of or in connection with the performance of the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorneys' fees and other related costs and expenses. Contractor shall defend, at Contractor's own cost, expense and risk, with District's Board of Directors' choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against District, its officials, officers, agents, employees and representatives. To the extent of its liability, Contractor shall pay and satisfy any judgment, award or decree that may be rendered against District, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. Contractor shall reimburse District, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code Section 2782.

ARTICLE 50. RECORD ("AS BUILT") DRAWINGS

a. Contractor shall prepare and maintain a complete set of record drawings (herein referred to as "as-builts") and shall require each trade to prepare its own as-builts. The as-builts must show the entire site for each major trade, including but not limited to water, sewer, electrical, data, telephone, cable, fire alarm, gas and plumbing. Contractor shall mark the as-builts to show the actual installation where the installation varies from the Work as originally shown. Contractor shall mark whichever drawings are most capable of showing conditions fully and where shop drawings are used, Contractor must record a cross-reference at the corresponding location on the contract drawings. Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. Contractor shall use colors to distinguish variations in separate categories of The Work.

b. Contractor shall note related change order numbers where applicable. Contractor shall organize as-builts into manageable sets, bound with durable paper cover sheets and shall print suitable title, dates and other identification on the cover of each set. Contractor to also provide an electronic version of the as-builts. The suitability of the as-builts will be determined by the Engineer.

ARTICLE 51. RESOLUTION OF CONSTRUCTION CLAIMS

a. In accordance with Public Contract Code Sections 20104 et seq. and other applicable law, public works claims of $375,000 or less which arise between the Contractor and District shall be resolved under the following procedure unless District has elected to resolve the dispute pursuant to Public Contract Code Section 10240 et seq.

b. **All Claims.** All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the Contractor for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the Contractor and payment of which is not otherwise expressly provided for or the Contractor is not otherwise entitled, or (3) an amount the payment of which is disputed by District.

c. **Claims Under $50,000.** District shall respond in writing to the claim within 45 days of receipt of the claim, or, District may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims District may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of District and the Contractor. District's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the Contractor to produce the additional information, whichever is greater.

d. **Claims over $50,000 but less than or equal to $375,000.** District shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims District may have against the Contractor. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between District and the Contractor. District's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the Contractor to produce the additional information or documents, whichever is greater. The Contractor shall make these records and documents available at all reasonable times, without any direct charge.

e. **All Claims.** The Contractor will submit the claim justification in the following format:

1) Summary of claim merit and price, and Contract clause pursuant to which the claim is made.
2) List of documents relating to claim
    (a) Specifications
    (b) Drawings
    (c) Clarifications (Requests for Information)
    (d) Schedules
    (e) Other
3) Chronology of events and correspondence
4) Analysis of claim merit
5) Analysis of claim cost
6) Analysis of time impact analysis in CPM format
7) Cover letter and certification of validity of the claim

f. **All Claims.** Notwithstanding the foregoing, all public works claims between the Contractor and the District shall be resolved pursuant to the procedures set forth in Public Contract

Code Section 9204. The District will provide a written response to the Contractor identifying what portion of the claim is disputed and what portion is undisputed within 45 days of receipt of the claim, unless the parties mutually agree to extend the time for response. If the District does not respond within the 45-day time period, or as extended by mutual agreement, the claim shall be deemed rejected in its entirety.

g. **All Claims.** If the Contractor disputes District's response, or if District fails to respond within the statutory time period(s), the Contractor may so notify District within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, District shall schedule a meet and confer conference within 30 days.

h. **All Claims.** Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion thereof remains in dispute, the District shall provide the Contractor with a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any portion of the claim that remains in dispute shall be submitted to nonbinding mediation. The selection of the mediator shall be in accordance with Public Contract Code section 9204, and the District and the Contractor shall equally share the associated mediator fees. Each party will be responsible for its own attorneys' fees and other costs.

i. The Contractor must comply with the claims filing procedures set forth in Government Code section 900 et seq. for any claim or any portion thereof that remains in dispute after the meet and confer conference. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the Contractor submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.

j. Submission of a claim, properly certified, with all required supporting documentation, and written rejection or denial of all or part of the claim by District, is a condition precedent to any action, proceeding, litigation, suit, general conditions claim, or demand for arbitration by Contractor.

k. **Government Code Claim.** In addition to any and all contract requirements pertaining to notices of and requests for compensation or payment for extra work, disputed work, construction claims and/or changed conditions, the Contractor must comply with the claim procedures set forth in Government Code section 900 *et seq.* prior to filing any lawsuit against the District. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved after all procedures pertaining to extra work, disputed work, construction claims, and/or changed conditions have been followed by Contractor. If no such Government Code claim is submitted, or if the prerequisite contractual requirements are not otherwise satisfied as specified herein, Contractor shall be barred from bringing and maintaining a valid lawsuit against the District.

ARTICLE 52. DISTRICT'S RIGHT TO TERMINATE CONTRACT

a. **Termination for Cause**: District may, without prejudice to any other right or remedy, serve written notice upon Contractor of its intention to terminate this Contract if the Contractor:

(i) refuses or fails to prosecute The Work or any part thereof with such diligence as will ensure its completion within the time required; (ii) fails to complete The Work within the required time; (iii) should file a bankruptcy petition or be adjudged a bankrupt; (iv) should make a general assignment for the benefit of its creditors; (v) should have a receiver appointed; (vi) should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials to complete the work; (vii) should fail to make prompt payment to subcontractors or for material or labor; (viii) persistently disregard laws, ordinances, other requirements or instructions of District; or (ix) should violate any of the provisions of the Contract Documents.

The notice of intent to terminate shall contain the reasons for such intention to terminate. Unless within ten (10) Days after the service of such notice, such condition shall cease or satisfactory arrangements (acceptable to District) for the required correction are made, this Contract shall be terminated. In such case, Contractor shall not be entitled to receive any further payment until the Project has been finished. District may take over and complete The Work by any method it may deem appropriate. Contractor and its surety shall be liable to District for any excess costs or other damages incurred by District to complete the Project. If District takes over The Work, District may, without liability for so doing, take possession of and utilize in completing The Work such materials, appliances, plant, and other property belonging to the Contractor as may be on the Project site.

b. **Termination For Convenience:** District may terminate performance of The Work in whole or, in part, if District determines that a termination is in District's interest.

The Contractor shall terminate all or any part of The Work upon delivery to the Contractor of a Notice of Termination specifying that the termination is for the convenience of District, the extent of termination, and the effective date of such termination.

After receipt of Notice of Termination, and except as directed by District, the Contractor shall, regardless of any delay in determining or adjusting any amounts due under this Termination for Convenience clause, immediately proceed with the following obligations:

1) Stop Work as specified in the Notice.

2) Complete any Work specified in the Notice of Termination in a least cost/shortest time manner while still maintaining the quality called for under the Contract Documents.

3) Leave the property upon which the Contractor was working and upon which the facility (or facilities) forming the basis of the Contract Documents is situated in a safe and sanitary manner such that it does not pose any threat to the public health or safety.

4) Terminate all subcontracts to the extent that they relate to the portions of The Work terminated.

5) Place no further subcontracts or orders, except as necessary to complete the remaining portion of The Work.

6) Submit to District, within ten (10) Days from the effective date of the Notice of Termination, all of the documentation called for by the Contract Documents to substantiate all costs incurred by the Contractor for labor, materials and equipment

through the Effective Date of the Notice of Termination. Any documentation substantiating costs incurred by the Contractor solely as a result of District's exercise of its right to terminate this Contract pursuant to this clause, which costs the Contractor is authorized under the Contract Documents to incur, shall: (i) be submitted to and received by District no later than thirty (30) Days after the Effective Date of the Notice of Termination; (ii) describe the costs incurred with particularity; and (iii) be conspicuously identified as "Termination Costs Occasioned by District's Termination for Convenience."

7) These provisions are in addition to and not in limitation of any other rights or remedies available to District.

c. **Savings Clause**. If the District terminates Contractor for cause, and if it is later determined that the termination was wrongful, such default termination shall automatically be converted to and treated as a termination for convenience. In such event, Contractor shall be entitled to receive only the amounts payable under this section, and Contractor specifically waives any claim for any other amounts or damages, including, but not limited to, any claim for consequential damages or lost profits.

d. **Exception.** Notwithstanding any other provision of this Article, when immediate action is necessary to protect life and safety or to reduce significant exposure or liability, District may immediately order Contractor to cease Work on the Project until such safety or liability issues are addressed to the satisfaction of District or the Contract is terminated.

ARTICLE 53. WARRANTY AND GUARANTEE

a. Contractor warrants that all materials and equipment furnished under this Contract shall be new unless otherwise specified in the Contract Documents; and that all Work conforms to the Contract Document requirements and is free of any defect whether performed by the Contractor or any subcontractor or supplier.

b. Unless otherwise stated, all warranty periods shall begin upon the filing of the Notice of Completion. Unless otherwise stated, the warranty period shall be for one year.

c. The Contractor shall remedy at its expense any damage to District-owned or controlled real or personal property.

d. Contractor shall furnish District with all warranty and guarantee documents prior to final Acceptance of the Project by District.

e. District shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) Days after being notified commence and perform with due diligence all necessary Work. If the Contractor fails to promptly remedy any defect, or damage; the District shall have the right to replace, repair, or otherwise remedy the defect, or damage at the Contractor’s expense.

f. In the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the Contractor not in accordance with the Contract requirements, District may undertake at Contractor’s expense, and without prior notice, all Work necessary to correct such condition.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for Work performed and Materials furnished under this Contract, the Contractor shall:

1) Obtain for District all warranties that would be given in normal commercial practice;

2) Require all warranties to be executed, in writing, for the benefit of District; and

3) Enforce all warranties for the benefit of District, unless otherwise directed in writing by District.

This Article shall not limit District's rights under this Contract or with respect to latent defects, gross mistakes, or fraud. District specifically reserves all rights related to defective work, including but not limited to the defect claims pursuant to California Code of Civil Procedure Section 337.15.

ARTICLE 54. DOCUMENT RETENTION & EXAMINATION

a. In accordance with Government Code Section 8546.7, records of both District and the Contractor shall be subject to examination and audit by the State Auditor General for a period of three (3) years after final payment.

b. Contractor shall make available to District any of the Contractor's other documents related to the Project immediately upon request of District.

c. In addition to the State Auditor rights above, District shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of the cost or pricing data at no additional cost to District, for a period of four (4) years after final payment.

ARTICLE 55. SOILS INVESTIGATIONS

When a soils investigation report for the Project site is available, such report shall not be a part of the Contract Documents. Any information obtained from such report as to subsurface soil condition, or to elevations of existing grades or elevations of underlying rock, is approximate only and is not guaranteed. Contractor acknowledges that any soils investigation report (including any borings) was prepared for purposes of design only and Contractor is required to examine the site before submitting its bid and must make whatever tests it deems appropriate to determine the underground condition of the soil.

ARTICLE 56. SEPARATE CONTRACTS

a. District reserves the right to let other contracts in connection with this Work or on the Project site. Contractor shall permit other contractors reasonable access and storage of their materials and execution of their work and shall properly connect and coordinate its Work with theirs.

b. To ensure proper execution of its subsequent Work, Contractor shall immediately inspect work already in place and shall at once report to the Engineer any problems with the work in place or discrepancies with the Contract Documents.

c. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by District in prosecution of the Project to the end that Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy at site of the Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, the Engineer shall decide which Contractor shall cease Work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously. District shall not be responsible for any damages suffered or for extra costs incurred by Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project site.

ARTICLE 57. NOTICE AND SERVICE THEREOF

All notices shall be in writing and either served by personal delivery or mailed to the other party as designated in the Bid Forms. Written notice to the Contractor shall be addressed to Contractor's principal place of business unless Contractor designates another address in writing for service of notice. Notice to District shall be addressed to District as designated in the Notice Inviting Bids unless District designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) Days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE 58. NOTICE OF THIRD PARTY CLAIMS

Pursuant to Public Contract Code Section 9201, District shall provide Contractor with timely notification of the receipt of any third-party claim relating to the Contract.

ARTICLE 59. STATE LICENSE BOARD NOTICE

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 60. INTEGRATION

a. Oral Modifications Ineffective. No oral order, objection, direction, claim or notice by any party or person shall affect or modify any of the terms or obligations contained in the Contract Documents.

b. Contract Documents Represent Entire Contract. The Contract Documents represent the entire agreement of District and Contractor.

ARTICLE 61. ASSIGNMENT

Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract or any part thereof including any claims, without prior written consent of District. Any assignment without the written consent of District shall be void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or Material supplied for performance of Work called for under the Contract Documents in favor of all persons, firms, or corporations rendering such services or supplying such Materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure or the Government Code.

ARTICLE 62. CHANGE IN NAME AND NATURE OF CONTRACTOR'S LEGAL ENTITY

Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify District in order that proper steps may be taken to have the change reflected on the Contract.

ARTICLE 63. ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Section 7103.5 of the Public Contract Code, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, Contractor or subcontractor offers and agrees to assign to 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. Section 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 the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time District makes final payment to the Contractor, without further acknowledgment by the parties.

ARTICLE 64. PROHIBITED INTERESTS

No District official or representative who is authorized in such capacity and on behalf of District to negotiate, supervise, make, accept, or approve, or to take part in negotiating, supervising, making, accepting or approving any engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the project, shall be or become directly or indirectly interested financially in the Contract.

ARTICLE 65. LAWS AND REGULATIONS

a. Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on conduct of work as indicated and specified. If Contractor observes that drawings and specifications are at variance therewith, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided for in this Contract for changes in work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he shall bear all costs arising therefrom.

b. Contractor shall be responsible for familiarity with the Americans with Disabilities Act ("ADA") (42 U.S.C. § 12101 et seq.). The Work will be performed in compliance with ADA regulations.

ARTICLE 66. PATENT FEES OR ROYALTIES

The Contractor shall include in its bid amount the patent fees or royalties on any patented article or process furnished or used in the Work. Contractor shall assume all liability and responsibility arising from the use of any patented, or allegedly patented, materials, equipment, devices or processes used in or incorporated with The Work, and shall defend, indemnify and hold harmless District, its officials, officers, agents, employees and representatives from and against any and all liabilities, demands, claims, damages, losses, costs and expenses, of whatsoever kind or nature, arising from such use.

ARTICLE 67. OWNERSHIP OF DRAWING

All Contract Documents furnished by District are District property. They are not to be used by Contractor or any subcontractor on other work nor shall Contractor claim any right to such documents. With exception of one complete set of Contract Documents, all documents shall be returned to District on request at completion of The Work.

ARTICLE 68. NOTICE OF TAXABLE POSSESSORY INTEREST

In accordance with Revenue and Taxation Code Section 107.6, the Contract Documents may create a possessory interest subject to personal property taxation for which Contractor will be responsible.

END OF GENERAL CONDITIONS

SPECIAL CONDITIONS

District has not made findings pursuant to Public Contract Code Section 3400(b) regarding the use of specific materials, products, things, and/or services that must be utilized for the Project.

END OF SPECIAL CONDITIONS

PART E

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SECTION 01000

GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 DEFINITIONS

Wherever the following terms or pronouns occur in these Standard Specifications or in related documents, the intent and meaning shall be interpreted as follows:

A. **"Approved Plans"** shall mean the official plans, profiles, typical cross-sections, working drawings, detail drawings, or exact reproductions thereof, approved by the District and other appropriate government agencies, which show the locations, character, dimensions, and details of the work required to construct the specified public improvements.

B. **"Approved Materials List"** shall mean the listing of those materials reviewed, tested, and allowed for use by the District for installation of its facilities (which may include potable water, recycled water and sewer facilities).

C. **"Board"** shall mean the Board of Directors of the District of jurisdiction.

D. **"Contractor"** shall mean the independent person, firm, corporation or partnership with whom the District or Developer contracts for the performance of the work or any part thereof covered by the Approved Plans and these Standard Specifications. Instructions or information given by the District to the Contractor's superintendent or agent on the Project shall be considered as having been given to the Contractor.

E. **"District"** shall mean the Utility District of jurisdiction.

For the unique purpose of these Standard Specifications, District shall also refer to the District's representative(s) acting within the scope of the particular duties entrusted to them.

The District shall resolve any and all issues which may arise with regard to the quality or acceptability of approved materials furnished or work performed, to the manner of perfor mance and rate of progress of the work and shall answer all questions relating to the interpretation of the Standard Drawings, the Approved Plans, the job specifications, if any, and these Standard Specifications as well as the acceptable fulfillment of the Contract on the part of the Developer.

F. **"District Engineer"** or **"Engineer"** shall mean the District's Chief Engineer, or the District's General Manager, acting either directly or through properly authorized agents, such agents acting severally within the scope of the particular duties entrusted to them.

G. **"Inspector"** shall mean the District's authorized agent whose duties shall include those defined elsewhere within these Standard Specifications, but who shall not direct the work being performed.

H. **"Engineer of Work"** or **"Private Engineer"** shall mean a Civil Engineer or Structural Engineer registered or licensed in California who is qualified to act as an agent of the Developer in preparing plans for facilities to be approved and accepted by the District and incorporated thereafter into the District's system

I. **"Project"** or the **"Work"** shall mean the public improvement to be constructed in whole or part within the boundaries of the District.

J. **"Standard Drawings"** shall mean the standard details issued by the District for construction of District facilities.

K. **"Water Agencies' Design Guide"** or **"Water Agencies' Standards Design Guide"** or **"Design Guide"** shall mean the current version of the Fallbrook Public Utilities District Standards Design Guidelines for Potable Water, Recycled Water and Sewer Facilities as adopted and published by the District.

L. **"Water Agencies' Standards"** or **"Water Agencies' Standard Specifications"** or **"Standard Specifications"** shall mean the current version of the Water Agencies' Standard Specifications for Potable Water, Recycled Water and Sewer Facilities as adopted and published by the member agencies of the Water Agencies' Standards Committee.

1.02 LICENSE

The Contractor installing any new facilities or performing work on existing facilities within the District shall possess, prior to the start of the Project, a License, defined by the latest edition of the California Contractor's License Law and Reference Book, as:

A. Class A or C-34 for water pipeline installations.

B. Class A or C-42 for sewer pipeline installations.

C. Class A for major water and sewer facilities such as pump stations, reservoirs and treatment plants.

Any Contractor possessing a license other than a Class A must receive written approval from the District prior to initiating the work.

1.03 OPERATIONS IN PUBLIC RIGHT-OF-WAY

Work in public right-of-way shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the work is located, in addition to the requirements of the Approved Plans and Standard Specifications. If a permit is not required, the work shall conform to the standards of the public agency involved in addition to conforming to the Approved Plans and Standard Specifications.

1.04 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS & PERMITS

The Contractor shall abide by the conditions of the Regional Water Quality Control Board, General Construction Activity Storm Water Permit and the project Storm Water Pollution Prevention Plan (SWPPP). Contractor shall obtain necessary Storm Water permits

1.05 REFERENCE STANDARDS

The reference standards of the organizations listed below form a part of these Standard Specifications to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise stated.

	AGENCY	ADDRESS
AASHTO	American Association of State Highway and Transportation Officials	444 N. Capital St. Washington, D.C. 20004
ACI	American Concrete Institute	P.O. Box 19150 Detroit, MI 48219
ANSI	American National Standards Institute	1430 Broadway New York, NY 10018
ASA	American Standards Association	70 East 45th Street New York, NY 10017
ASME	American Society of Mechanical Engineers	345 E. 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials	1916 Race Street Philadelphia, PA 19103
AWS	American Welding Society	550 N.W. Le Jeune Rd. Miami, FL 33135
AWWA	American Water Works Association, Inc.	6666 W. Quincy Ave. Denver, CO 80235
CAL/ OSHA	State of California Occupational Safety and Health Administration	1006 Fourth Street Sacramento, CA 95814
CFR	Code of Federal Regulations	Office of Federal Register National Archives Administration Washington, D.C. 20408
CRSI	Concrete Reinforcing Steel Institute	228 N. La Salle St. Chicago, IL 60601
CSLB	Contractors State License Board	9821 Business Park Dr. Sacramento, CA 95827
NACE	National Association of Corrosion Engineers	1440 South Creek Dr. Houston, TX 77084
NFPA	National Fire Protection Agency	Battery March Park Quincy, MA 02269
NSF	National Sanitation Foundation	P.O. Box 130140 Ann Arbor, MI 48113
SDG&E	San Diego Gas and Electric Company	101 Ash Street San Diego, CA 92102
SSPC	Steel Structures Painting Council	4400 Fifth Ave. Pittsburgh, PA 1521

	AGENCY	ADDRESS
SSPWC	Standard Specifications for Public Works Construction (Greenbook)	Joint Cooperative Committee c/o Associated General Contractors of California 1255 Corporate Center Dr., Suite 100 Monterey Park, CA 91754
UBC	Uniform Building Code	International Conference of Building Officials 5360 Workman Mill Rd. Whittier, CA 90601
UNI-B	Uni-Bell PVC Pipe Association	2655 Villa Creek Dr., Ste. 155 Dallas, TX 75234
UPC	Uniform Plumbing Code	International Conference of Plumbing and Mechanical Officials 20001 E. Walnut Dr. South Walnut, CA 91789

1.06 ORDER OF PRECEDENCE

The Approved Plans, together with District Standard Specifications, shall govern the work to be done. Anything indicated in the Standard Specifications but not shown on the Approved Plans, or shown on the Approved Plans but not indicated in the Standard Specifications, shall be of like effect as though shown or indicated in both. In resolving inconsistencies between the Approved Plans and the various sections of the Standard Specifications, the order of precedence shall be as follows:

1. Technical Specifications (Standard Specifications Sections 2 through 16)
2. Appendices to the Standard Specifications
3. Standard Drawings
4. Approved Plans
5. Approved Materials Lists
6. General Specifications (Standard Specifications Section 1)
7. Reference Standards

Figure dimensions on drawings shall take precedence over scale dimensions. Detailed drawings shall take precedence over general drawings. The Contractor shall immediately notify District if any conflict, inconsistency, omission, error, or ambiguity is discovered between the Approved Plans and the various sections of the Standard Specifications.

1.07 EXAMINATION OF APPROVED PLANS, SPECIFICATIONS, AND SITE

The Contractor shall carefully examine the site of the proposed work, the Approved Drawings, the Specifications, and all other pertinent documents. Contractor shall be satisfied as to the character, quality and quantities of work to be furnished, and as to the requirements of the

Approved Plans and these Standard Specifications. The District will not be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the Approved Plans and the actual conditions revealed during the progress of the work or otherwise.

1.08 QUALITY OF WORK AND MATERIALS

The work shall be performed in a thorough, worker-like manner in accordance with the Approved Plans and these Standard Specifications. All work shall conform to the lines and grades shown on said plans.

At least one member of the Contractor's workforce who is thoroughly familiar with the specified requirements of work and who is completely trained and experienced in the construction skills necessary for satisfactory completion of the work shall be present at the site, directing the work, at all times.

Adequate number of skilled workers and sufficient and appropriate equipment shall be present at the site prior to commencing daily construction operations.

The Engineer shall inform the Contractor if any person in the employ of the Contractor fails to or refuses to comply with the requirements of these Specifications, or appears to the Engineer to be incompetent or unfit, or acts in a disorderly, improper or unsafe manner. It shall be the Contractor's responsibility to dismiss any such person from the work site or take any other action deemed appropriate by the Contractor.

All equipment, materials, and supplies to be incorporated in the work shall be new. All equipment, material and supplies shall be produced in a good and worker-like manner. Materials to be used within the scope of work on the project shall be those listed in the current Approved Materials List. When the quality of a material, process, or article is not specifically set forth in the Approved Materials List, the Approved Plans, or the Specifications, the best available quality of the material, process, or article shall be provided.

The Contractor may offer as substitution any material, process, or article substantially equal or better in every respect to that so indicated or specified; provided, however, that if the material, process, or article offered by the Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then the Contractor must furnish the material, process, or article specified or one that in the opinion of the District is substantially equal or better in every respect.

1.09 SHOP DRAWING PROCEDURES

A. Unless amended by job specifications, Contractor shall submit three (3) copies of all shop drawings, submittals, and manufacturer's cut sheets detailing the methods and materials intended for use on the project, and one electronic copy. Submittals shall be numbered according to specification section, shall be accompanied by a transmittal letter marked with the number and title of the submittal, name of the project, name and address of the supplier, along with contact persons for same, and shall be checked by and marked with the approval of the Contractor. In addition, any submittals that deviate from the requirements of the Contract shall be clearly noted and explained in the transmittal letter.

B. District will review the submittals so provided, and will return the submittals marked to indicate that submittals are approved or must be returned for revision. Unless amended by job specifications, District shall be allowed a minimum of ten (10) working days for the review of submittals. Submittals returned for revision must be corrected as noted and developer must re-submit shop drawings as noted above until approved by District. Review and approval of shop drawings by District shall not relieve developer of the

responsibility for executing the work in accordance with these Standard Specifications, using proper methods of construction, nor from furnishing materials or work required but not indicated on the submittals.

C. Construction shall not begin on relevant portions of the work until shop drawing submittals have been approved by District. Shop drawings shall be submitted in a timely manner so as not to delay construction of the work.

1.10 MATERIALS

All materials shall be new and unused, of the quality defined in the Specifications, and approved by the District Engineer. All materials to be used within a specific project and intended for equivalent uses shall be identical as to manufacturer and model number. Materials not identical as to manufacturer and model number to those approved by the District Engineer, materials that are damaged, or materials that are otherwise unacceptable to the District Engineer shall be rejected and immediately removed from the job site.

A. Job-specific approval of materials not shown on the Approved Materials List is solely at the discretion of the District Engineer, and materials so approved shall not be construed as approved for general use. For job-specific consideration of materials not shown on the Approved Materials List, the shop drawing procedures outlined within this Section Requirements shall be followed.

1.11 PRE-CONSTRUCTION CONFERENCE

A. The Contractor shall schedule a Pre-Construction Conference with the District's Inspection Department at least fourteen (14) days prior to beginning any water or sewer work in the field. As a minimum, the attendees at this conference shall include:

1. The District Engineer.

2. The Contractor's Superintendent.

3. Contractor’s Competent Person.

4. The District Inspector.

B. The purpose of this meeting is to review the plans for the project relative to the requirements of the District's Standard Specifications, the Approved Plans, and the Approved Materials List. The Contractor shall be prepared to discuss, in detail, the project schedule, and shall provide the District with any schedules, submittals, lists, permits, or other information required by the Engineer, by these Standard Specifications or by the job specifications.

1.12 INSPECTION

All work and materials furnished shall be subject to inspection for compliance with these Standard Specifications and all other appropriate specifications.

The Contractor shall make application to the District for inspection at least five (5) days in advance of starting any work. Inspectors shall be recognized as authorized agents of the District, and their duties shall be to evaluate materials used and work performed. Instructions given by the Inspector shall be respected and executed by the Contractor.

The District shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and for inspection. The Contractor shall provide adequate safe means by which to inspect the work.

Failure or oversight of any Inspector to condemn defective materials at the time of use, or to condemn improper work at the time it is performed, shall not diminish the Contractor's obligations to meet the requirements of the Approved Plans and these Standard Specifications. The Contractor shall remove and replace any faulty materials and work at no additional cost to the District upon discovery of the defects or upon receipt of notice from the District to do so.

Defective work or material may be rejected prior to the date of acceptance of the work notwithstanding that such defective work or material may have been previously inspected. Acceptance shall not constitute approval of latent defects or waiver of maintenance requirements.

Any work covered up or otherwise rendered inaccessible without approval or consent of the District must, if required by the District, be uncovered for examination at the Contractor's expense. Any work done in the absence of the Inspector without written permission shall be subject to rejection.

1.13 TESTING LABORATORY SERVICES

A. The Contractor shall engage testing firms to provide the various testing required for the project. Soils testing is typically required for projects, but concrete testing or other types of testing may additionally be required. The testing firm shall provide a competent, on-site Soils Technician to perform the various compaction testing required for the project. All tests shall be performed at the direction of the Soils Technician and in a manner acceptable to the District. Soils testing shall be performed in accordance with Section 02223 of these Standard Specifications.

B. Prior to the District's acceptance of the project, a report of all soils tests taken shall be submitted to the District in accordance with Section 02223 of these Standard Specifications.

1.14 CONSTRUCTION STAKING AND PRESERVATION OF MONUMENTS

The Contractor shall perform all surveying and provide all GPS coordinate data to the District. The Contractor shall use the County's high precision GPS control network and shall provide the data using the same basis of coordinates used to prepare the Plans.

Staking of the various public improvements required shall be performed by the Contractor's surveyor. Generally, stakes for alignment and grade shall be set at 7.6m (25') intervals. The survey shall conform to the lines, grades, and dimensions shown on the Approved Plans. The District shall give an account of the adequacy, readability, and frequency of the stakes provided and shall comment on any remedies required.

The Contractor shall preserve all monuments, benchmarks, survey marks, and stakes. In case of their removal or destruction by Contractor or its employees, agents or subcontractors, the Contractor shall be liable for the cost of their replacement.

1.15 ENVIRONMENTAL CONTROL

The Contractor shall abide by all applicable local, state and federal regulations, and by the conditions of the Regional Water Quality Control Board.

The Contractor shall provide effective measures where necessary to prevent operations from producing dust in an amount damaging to property or causing a nuisance as determined by the District. The Contractor shall be responsible for any damage due to dust originating from its operations.

The Contractor shall anticipate and correct any erosion problem arising from its operations.

1.16 PUBLIC SAFETY AND TRAFFIC CONTROL

A. The Contractor shall at all times conduct operations in a manner causing the minimum obstruction and inconvenience to public traffic. The Contractor shall not interfere with the normal operation of public transit vehicles unless otherwise authorized. Open trenches and excavations shall be provided with adequate barricades in accordance with the approved traffic control plan or the requirements of the agency of jurisdiction. At night, lights shall mark all open work and obstructions. The Contractor shall install and maintain all signs, lights, flares, barricades, traffic plates, railings, runways, stairs, bridges and other equipment necessary to safeguard the public. Safety instructions received from governmental authorities shall be followed, but compliance with such instructions shall not diminish the Contractor’s responsibility or liability for accidents to workers or damage or injury to persons or property.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work, and the Contractor shall fully comply with all state, federal, and other laws, rules, regulations, and orders relating to the safety of workers and others.
The right of the District to conduct construction review or observation of the Contractor's performance does not include review or observation of the adequacy of the Contractor's safety measures in, on, or near the construction site.

The Contractor shall take immediate action to correct any condition adversely affecting public safety.

B. The Contractor shall submit a traffic control plan to the County of San Diego and shall obtain approval prior to starting the work.

1.17 PROTECTION OF EXISTING FACILITIES

A. The Contractor's attention is directed to the possible existence of pipe and other underground improvements that may or may not be shown on the Approved Plans. Once discovered, the Contractor shall preserve and protect all such improvements whether shown on the Approved Plans or not. The Contractor shall provide and install suitable safeguards, and shall be responsible for the care and protection of all existing sewer and water pipe, electrical and telephone conduits, gas mains, culverts, or other above-ground

or below-ground facilities or structures which may be encountered in or near the area of work. It shall be the responsibility of the Contractor to notify each agency of jurisdiction and utility company and to make arrangements for location of facilities prior to beginning construction. In the event of damage to existing facilities during the progress of the work, such facilities shall be replaced or restored to original condition, as determined by District, at the Contractor's expense.

B. The Contractor shall be responsible for determining in advance the location, elevation, alignment and pipe type and size of all existing pipelines to which connections are to be made. Potholing to determine location will be allowed only after providing the District with three (3) day's advance notice. The Contractor is required to contact Underground Service Alert (USA) at 1-800-227-2600 or 1-800-422-4133 for mark-out of all utilities in the area of the work.

C. If the Contractor, either before commencing work or during the course of the work, finds any discrepancy between specifications or drawings and the physical conditions at the site of the work, Contractor shall promptly notify the District in writing of such discrepancy.

1.18 PROTECTION OF LANDSCAPING

A. The Contractor shall be responsible for the protection of all trees, shrubs, fences, and other landscape items adjacent to or within the work area, unless specific removals are indicated on the Approved Plans.

B. In the event of damage to landscape items, including the thickness of topsoil, the Contractor shall replace the damaged items in kind, in a manner satisfactory to the District and the Developer.

C. When pipelines are proposed within planted or otherwise improved areas in public or private easements, the Contractor shall restore such areas to original condition after completion of the work.

D. When pipelines are proposed within unimproved areas, the ground surface shall be dressed smooth to the contour of the original ground and left in a neat, presentable condition, free of cleared vegetation, rubbish and other construction wastes. Rocks and clumps that cannot be readily covered by spreading shall be hauled away and disposed of by the Contractor.

E. Unimproved areas disturbed during construction of the pipeline shall be hydro seeded in accordance with these Standard Specifications.

1.19 PUBLIC UTILITIES

A. In case it should be necessary to relocate or temporarily maintain the property of any public utility or any other property, and it is understood that the cost of such relocation or temporary maintenance is not required to be borne by the owner of the utility or property, the Contractor shall bear all expenses incidental to the removal or temporary maintenance of such property in a manner satisfactory to said owner. It is understood that in such cases, the utility or property owner has the option of doing such work with his or her own forces, or permitting the work to be performed by the Contractor.

B. The right is reserved to the State, County, City, District or utility owners to enter at any time upon any street, alley, right of way or easement for the purpose of making changes for maintenance or repairs to their property necessitated by the Contractor's work.

1.20 UTILITIES CROSSING WATER, RECYCLED WATER OR SEWER FACILITIES

Wherever new utilities cross under or over water, recycled water or sewer facilities, the minimum vertical separation shall be 300mm (12”) unless otherwise approved by the District Engineer. All new utilities crossing under or over water, recycled water or sewer facilities shall remain exposed until inspected and approved by the District Engineer. Wherever new utilities cross under or over water, recycled water or sewer facilities, backfill and compaction within the limits of the water, recycled water, or sewer facility trench width shall be in strict conformance with the backfill and compaction requirements specified herein.

1.21 HORIZONTAL SEPARATION OF UTILITIES PARALLELING WATER, RECYCLED WATER OR SEWER FACILITIES

Wherever new utilities parallel water, recycled water or sewer facilities, the minimum horizontal separation shall be such that 900mm (36”) of undisturbed soil separates adjacent trench edges, unless otherwise approved by the District Engineer.

1.22 PROTECTION OF WORKERS IN TRENCH EXCAVATION

Whenever work involves trench excavation, the Contractor shall provide all necessary shoring, bracing, sloping, or other provisions to be made for worker protection from hazard of caving ground during the excavation. If such plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Industrial Safety, a Civil Engineer or Structural Engineer registered in the State of California shall prepare the plans.

Contractor shall comply with the Safety Orders of California, Code of Regulations: Title 8, Section 1539 (Excavation, Trenches, Earthwork).

1.23 WORK WITHIN CONFINED SPACES

The Contractor shall comply with all Federal and State regulations for confined space entry. Work inside confined spaces as defined by the applicable regulations shall not be undertaken until all the tests and safety provisions of the Code of Federal Regulations 1910.146, and the Safety Orders of the California Code of Regulations Title 8 Article 108 sections 5156 et seq. for confined space entry have been performed and the area is verified as safe to enter.

1.24 CONSTRUCTION EQUIPMENT

The Contractor shall furnish appropriate construction equipment to perform the work in accordance with the Approved Plans and Specifications. Such equipment shall be in a good state of repair and shall be maintained in such state during the progress of the work. In no case shall the manufacturer's rating or capacity limitations for any equipment be exceeded.

1.25 STORAGE OF MATERIALS

All materials for use in the work shall be stored by the Contractor in such manner as to prevent damage from exposure to the elements, admixture of foreign materials, or from any other cause. The Contractor shall be entirely responsible for damage or loss by weather or other causes. The Material Safety Data Sheets (MSDS) for all products to be used in the work shall be kept on-site

by the Contractor, and the material manufacturer's recommendations for proper storage of its products shall be strictly followed.

Materials shall not be stored on District property without the written permission of the Engineer. The Contractor shall be responsible to provide its own storage area or property. Materials for use on the work shall be stored on private property only as allowed by law and with the written permission of the property owner, and a copy of such permission shall be provided to the District. In addition, a release letter signed by said property owner and stating that materials are no longer stored on the property and that Contractor has restored the area to original condition is required prior to the filing of the Notice of Completion.

1.26 HOURS OF WORK

The normal hours of work shall be between the hours of 7:30 a.m. and 4:30 p.m., Monday through Friday, excepting District-recognized holidays or as modified by Permits. The District shall receive written notice 5 days prior to any proposed change in work hours. In no case shall any work be performed outside of the normal working hours indicated above without prior approval by the District. Work hours associated with shutdowns shall be per Section 01115.

1.27 WATER AND POWER FOR CONSTRUCTION PURPOSES

Water for construction purposes:

A. All water used on the project shall be obtained from District's sources using a construction meter.

B. The construction meter and service connection shall be obtained from the District. The Contractor shall make arrangements with the District for payment of the deposit and installation of the meter.

C. The Contractor shall not be required to pay for construction water used in accordance with District's Rules and Regulations unless repeat testing is required or excessive water use is determined.

D. Damage caused to the meter will be charged to the Contractor.

E. Water for construction purposes outside the District's service area shall be obtained from the District within which the project lies.

Contractor shall make all arrangements for electrical power required during construction.

1.28 HOUSEKEEPING DURING CONSTRUCTION AND FINAL CLEAN-UP

A. The Contractor shall provide suitable drainage and shall erect such temporary structures as are necessary to protect the work or materials from damage. The Contractor shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the work or the materials occasioned by any cause before the acceptance of the work by District and shall bear the expense thereof.

B. The Contractor shall, at all times during the course of the work, maintain work areas and all adjacent properties and public access roads free from accumulations of waste, debris, rubbish or construction materials.

C The Contractor shall conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

D. Dry materials and rubbish shall be moistened to prevent blowing dust. Loads of excavated materials leaving the site or being imported to the site shall be covered or moistened to prevent blowing dust.

E. Upon completion of the work, and before making application for acceptance of the work, the Contractor shall clean all rights-of-way, streets, borrow pits, and all other grounds occupied by him in connection with the work. All rubbish, excess materials, temporary structures and equipment shall be removed. All parts of the work shall be left in a neat and presentable condition, as determined by the Engineer, prior to acceptance of the work by District.

1.29 HAZARDOUS WASTE AND UNKNOWN PHYSICAL CONDITIONS

If conditions listed below are found during construction, or if any other conditions are found during construction that may be detrimental to the District's facilities being constructed, or to the health and safety of the public, the Contractor shall promptly notify the District.

A. Material that the Contractor or Engineer believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, and is thus required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law. If such material is discovered, Contractor shall immediately cease work and shall not disturb the job site except as required to protect public safety.

B. Subsurface or latent physical conditions at the site differing from those indicated.

C. 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 in the Contract.

The Contractor shall promptly inform the District of any such conditions found during construction. The District shall investigate the conditions, and if it finds that the conditions do materially differ from those shown or expected, or do involve material that may be hazardous waste, Contractor shall cease work in the impacted area. If material that may be hazardous waste is discovered, the Developer shall insure that the appropriate government agencies are contacted prior to any further work being performed and that a solution is implemented.

1.30 WORK TO BE DONE

The work to be done consists of furnishing all materials, equipment, labor and all other items necessary for the construction and installation of a complete facility as shown on the Approved Plans and in accordance with these Specifications. In some instances, the District may furnish certain materials and services, which will be expressly called out on the Approved Plans.

The District’s approval of the plans prepared by a Private Engineer denotes agreement with the plans as prepared and is not an acceptance of responsibility as to accuracy. The Private Engineer shall be responsible for any errors, coordination with other agencies/utilities and interpretation of plans. The intent is that the completed Work shall be in general conformance with the Approved Plans and in accordance with the requirements of these Standard Specifications.

1.31 SCHEDULE

The Contractor shall submit for approval a detailed schedule of work as described in Specification Section 01115, Construction Sequence.

1.32 CHANGES TO THE WORK

If the District, due to conditions that change during the progress of the work, determines it impracticable for the Contractor to strictly comply with the Approved Plans or the Standard Specifications, the District may prescribe a modification of requirements. The District may at any time during the life of the project, by written order, make such changes as it may find necessary in the design, line, grade, form, location, dimensions, plan or material of any part of the work originally specified or shown on the Approved Plans.

1.33 RECORD DRAWINGS

A. During the course of the work, the Contractor shall keep accurate and updated records of the changes made to the work. The changes may be dictated by field conditions, unknown obstructions, design oversight, or other circumstances determined to be in the best interest of the District.

B. At the end of the project, the Contractor shall provide the District with two sets of prints, with all changes redlined. In addition to the field changes, the correct location of all water and sewer services and driveway centerlines with stations shall be indicated. The District's field representative shall verify that all changes have been included. All revisions will be incorporated.

C. Owner to survey and draw As-Builts.

1.34 PROJECT CLOSEOUT AND FINAL ACCEPTANCE

The District’s Board of Directors or designee shall be responsible for final acceptance of all projects. The following items of work shall be completed prior to final acceptance by District:

A. The project has been completed in accordance with the Approved Plans, the job specifications and these Standard Specifications.

B. Final inspection has been performed by District. Any “punch list” items generated by preliminary inspection shall have been completed.

C. Record drawings reflecting any changes to the project have been submitted to the District’s Inspection Department in accordance with these Standard Specifications.

D. A Soils Test Report has been submitted to the District in accordance with Section 02223 of these Standard Specifications.

E. All aspects of the Construction Agreement have been completed to the satisfaction of the District.

Following final acceptance by the District, the District will prepare a Notice of Completion and will have such Notice recorded by the County Recorder.

1.35 WARRANTY

A. The work shall be guaranteed against failure due to defective materials or workmanship for a period of one (1) year from the recording date of the Notice of Completion. The one-year warranty period shall not, in any way, affect the liability of any party for latent or patent defects allowed for under State law.

B. All repairs shall be made pursuant to the Development Agreement with the District and in accordance with the District's Rules and Regulations and current Standard Specifications.

1.36 WARRANTY INSPECTION

The District will perform a warranty inspection prior to the expiration of the one-year warranty period. The Developer will be notified in writing of any deficiencies revealed by this inspection. The warranty bond will not be released until the required repairs are completed. If the warranty inspection is satisfactory, the District will release the warranty bond at the end of the one-year warranty period.

PART 2 MATERIALS

"Not Used"

PART 3 EXECUTION

"Not Used"

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section defines the Lump Sum Prices listed in the Bid Schedule, and the manner in which they will be used to determine measurement and payment for all items included in the Bid Schedule. Parts 2 and 3 of this section describe the procedures required to be followed for monthly progress payments to the CONTRACTOR.

B. Payment for all items of the Bid Schedule shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of WORK being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs shall be included in the prices named in the Bid Schedule for the various items of WORK.

C. Monthly pay requests are due by the 10th of each month. Failure of the CONTRACTOR to submit his pay request by this date may be cause for the rejection of the pay request. If rejected, the CONTRACTOR will have to resubmit his pay request the next month. Should the submittal date fall on a holiday or weekend day during the month then the CONTRACTOR shall consider the next working day as the due date.

1.02 MEASUREMENT AND PAYMENT

A. General: This article defines the manner and method to develop the Lump Sum bid amounts of all items identified in the Bid Schedule. Bid amounts will include all plant, equipment, tools, materials, labor, service, and all other items required to complete the WORK included in the Contract unless specifically excluded by this section. WORK required for which no separate bid item is identified will be considered as a subsidiary obligation of the CONTRACTOR, and the cost therefore shall be included in the most applicable bid item.

B. Contract Required WORK

1. **Bid Item No. 1 – General Construction – Mobilization / Demobilization**

   Payment for general construction will be made at the lump sum price named in the Bid Schedule under **item No. 1**, which price shall constitute full compensation for completion of all mobilization, demobilization, insurance, supervision, planning, design, engineering, sheeting, shoring,

dewatering and all construction and permit fees associated with construction activities for CONTRACTOR required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents.

2. **Bid Item No. 2** – **Shoring per Excavation Safety Measures in State Labor Code Sections 6705 and 6707 (Lump Sum):**

This lump sum bid price includes all work related to Sheeting, Shoring and Bracing which will be made at the lump sum price named in the Bid Schedule under **item No. 2.** This price shall constitute full compensation for completion of all planning, design, engineering, furnishing and construction and removal of such temporary or permanent sheeting, shoring and bracing, complete for trenches, and structure excavation associated with construction activities for Contractor required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents, and as required under the provisions of all permits and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California. No separate payment shall be made for sheeting, shoring and bracing, including any sheeting left in place.

3. **Bid Item No. 3 – Dewatering**

This lump sum bid price includes all work related to Dewatering which will be made at the lump sum price named in the Bid Schedule under **item No. 3.** This price shall constitute full compensation for completion of all planning, design, engineering, furnishing and construction and removal of such temporary or permanent dewatering, complete for trenches, and structure excavation associated with construction activities for Contractor required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents, and as required under the provisions of all permits and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California.

4. **Bid Item No. 4 - General Construction – Pipe installation Sta. 0.00 – 8+45+ (Lump Sum):**

Payment for general construction will be made at the 1 lump sum price named in the Bid Schedule under **item No. 4**, which price shall constitute full compensation for completion of all supervision, planning, design, engineering and all construction and permit fees associated with construction activities for Contractor required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents, for segment from Station 0+00.00 to Station 08+45+.

PART 2 - PRODUCTS

2.01 GENERAL PROGRESS PAYMENT REQUIREMENTS

A. Earned value is derived from the current status of the CONTRACTOR Construction Schedule as determined by the monthly schedule status submittals. Each schedule status submittal is reviewed and approved by the District prior to the CONTRACTOR obtaining approval for the Summary of Earned Values or quantities installed and the Application for Payment.

PART 3 – EXECUTION

3.01 MONTHLY REVIEWS/APPLICATION FOR PAYMENT

A. Monthly review meetings between the CONTRACTOR and the District will be held within 7 days prior to the payment application date designated by the District. Prior to the monthly review meeting, the CONTRACTOR will submit the record of approved quantities installed and a signed application for payment showing a Summary of Earned Values for the reporting and payment period so that the District can compare earned values to available status data. The CONTRACTOR shall make any adjustments to the Master Record Documents, updated schedule, and payment applications deemed necessary. Upon completion of the adjustments the District will sign the payment request.

END OF SECTION

SECTION 01070

ABBREVIATIONS

PART 1 GENERAL

1.01 DESCRIPTION

This section describes abbreviations and how they are used in these specifications and on the Approved Drawings.

1.02 REFERENCED STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

CSI TD-2-4	-	Construction Specifications Institute Abbreviations
SSPWC	-	Standard Specifications for Public Works Construction "Greenbook"

1.03 DESCRIPTION

A. When references are made in these specifications to the standards, specifications, or other published data of various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only.

B. If an abbreviation is not listed below it shall be as described in Document TD-2-4 of the Construction Specifications Institute (CSI).

C. Where the use of the San Diego Area Standard Specifications for Public Works Construction "Greenbook" or Regional Standard Drawings are required, reference should be made to the SSPWC for the use and description of abbreviations.

D. Abbreviations can have more than one meaning. The abbreviation shall be considered with respect to different disciplines where the context in which each is used makes the meaning clear.

1. Example:

a. FF means "finish floor" when referring to a floor slab.

b. FF means "flat face" when referring to a pipe flange.

E. Discrepancies shall be noted and brought to the District's attention for interpretation.

1.04 LIST OF ABBREVIATIONS

The following list of abbreviations is for use in these Standard Specifications and the Approved Plans:

ABBREVIATION	TERMS
A	Ampere/Area
AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
AB	Anchor Bolt/Aggregate Base
ABAN	Abandoned
ABC	Asphalt Base Course
AC	Acre/Asphalt Concrete/Alternating Current
ACI	American Concrete Institute
ACP	Asbestos-Cement Pipe
ACU	Access Door
AE	Architect-Engineer
AFF	Above Finished Floor
AGG	Aggregate
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AL	Aluminum
AMB	Ambient
AMP	Ampere
ANG	Angle
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
ARCH	Architecture/Architectural
ARV	Air-Release Valve
ARVV	Air-Release and Vacuum Valve
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPH	Asphalt
ASSY	Assembly
ASTM	American Society for Testing and Materials
ATS	Automatic Transfer Switch
AVE	Avenue
AVG	Average
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
BB	Back-to-Back
BC	Beginning of Curve/Back of Curb/Bare Copper
BEG	Begin
BETW	Between
BF	Blind Flange
BHP	Brake Horsepower
BK	Back/Brake
BKR	Breaker
BL	Building
BLK	Block
BLVD	Boulevard
BM	Bench Mark/Beam
BO	Blowoff
BOP	Bottom of Pipe

ABBREVIATION	TERMS
BOT	Bottom
BP	Baseplate
BRG	Bearing
BRNZ	Bronze
BTN	Button
BTU	British Thermal Unit
BUR CBL	Buried Cable
BFV	Butterfly Valve
BVC	Begin Vertical Curve
BW	Block Wall
C	Conduit/Celsius/Civil Drawings/Copper
CAB	Crushed Aggregate Base
CAP	Capacity
CB	Catch Basin/Circuit Breaker
CC	Cooling Coil
C-C	Center-to-Center
CCB	Concrete Block
CCP	Concrete Cylinder Pipe
CD	Cross Drain/Condensate Drain/Ceiling Diffuser
CEM	Cement
CF	Cubic Feet/Curb Face
CFH	Cubic Feet per Hour
CFM	Cubic Feet per Minute
CFS	Cubic Feet per Second
CG	Construction Grade
C&G	Curb and Gutter
CHG	Change
CHKD PL	Checkered Plate
CI	Cast Iron
CIP	Cast In Place/Cast-Iron Pipe
CISP	Cast Iron Soil Pipe
CISPI	Cast-Iron Soil Pipe Institute
CJ	Construction Joint
CL	Centerline/Class/Clearance/Chlorine
CLIP	Concrete Lined In-Place Steel Pipe
CLR	Clear
CMLC	Cement-Mortar Lined & Coated Steel Pipe
CMLSP	Cement-Mortar Lined Steel Pipe
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CMU	Concrete Masonry Unit
CO	Cleanout/Conduit Only
COL	Column
COMM	Communication
COMP	Composite
COMPL	Complete
CONC	Concrete
CONN	Connection
CONST	Construct or Construction
CONT	Continuous
CONTR	Contractor
COORD	Coordinate/Coordinated
COP	Copper
COR	Corner
CORP	Corporation

ABBREVIATION	TERMS
CP	Cathodic Protection
CPLG	Coupling
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard, US Department of Commerce
CT	Center Top/Current Transformer
CTG	Coating
CTR	Center
CULV	Culvert
CU YD, CY	Cubic Yard
CYL	Cylinder
D	Degree of Curvature
DB	Direct Buried/Decibel
DBL	Double
DC	Direct Current
DEPT	Department
DET	Detail/Detour
DG	Decomposed Granite
DI	Drop Inlet
DIA	Diameter
DIAG	Diagonal
DIM	Dimension
DIMJ	Ductile-Iron Mechanical Joint
DIP	Ductile-Iron Pipe
DIPRA	Ductile-Iron Pipe Research Association
DISCH	Discharge
DIST	Distance
DMH	Drop Manhole
DN	Down
DR	Drain/Door
DSL	Diesel
DWG	Drawing
DWY	Driveway
E	East/Electrical Drawings
EA	Each
EC	End of Curve
ECC	Eccentric
ED	External Distance
EE	Each End
EF	Each Face/Exhaust Fan
EFF	Efficiency
EFL	Effluent
EGL	Energy Grade Line
EL	Elevation/Each Layer
E/L	Easement Line
ELEC	Electric
ELP	Elliptical
ENC	Encasement or Encased
ENCL	Enclosure
ENG	Engine
ENGR	Engineer
EOS	Equivalent Opening Size
EP	Edge of Pavement/Explosion Proof
EPA	Environmental Protection Agency (Federal)

ABBREVIATION	TERMS
EQ	Equation
EQL	Equal
ESMT	Easement
EST	Estimate or Estimated
ETC	And so Forth
EVC	End Vertical Curve
EW	Each Way
EXC	Excavate or Excavation
EXP	Expansion
EXST	Existing
EXT	Exterior/Extension
F	Fahrenheit/Floor
FAB	Fabricate
FBRBD	Fiberboard
FC	Foot-Candle
FCO	Floor Cleanout
FCV	Flow Control Valve
FD	Floor Drain
FDN	Foundation
FE	Flanged End/Fence
Fed Spec	Federal Specification
FF	Finished Floor/Flat Face
FG	Finished Grade
FH	Fire Hydrant
F&I	Furnish and Install
FIG	Figure
FIP	Female Iron Pipe Thread
FIT	Fitting
FL	Floor/Flow Line
FLG	Flange
FM	Force Main/Factory Mutual
FMH	Flexible Metal Hose
FNSH	Finish
FOC	Face of Concrete
FPC	Flexible Pipe Coupling
FPM	Feet per Minute
FPS	Feet per Second
FPUD	Fallbrook Public Utility District
FS	Finished Surface/Floor Sink/Federal Specifications
FSTNR	Fastener
FT	Feet
FTG	Footing
FUT	Future
G	Gas/General Drawings/Gram
GA	Gage
GAL	Gallon
GALV	Galvanized
GB	Grade Break
GDR	Guard Rail
GR	Grooved End
GENL	General
GFI	Ground Fault Interrupter
GM	Gas Main

ABBREVIATION	TERMS
GND	Ground
GPD	Gallons per Day
GPM	Gallons per Minute
GR	Grade
GSKT	Gasket
GUT	Gutter
GV	Gate Valve
H	Humidistat/Horizontal
HARN	Harness
HB	Hose Bib
HD	Heavy Duty
HDPE	High-Density Polyethylene Pipe
HGL	Hydraulic Grade Line
HGT	Height
HMWPE	High-Molecular Weight Polyethylene
HORIZ	Horizontal
HP	Horsepower/High Pressure
HPT	High Point
HR	Hour/Handrail
HS	High Strength
HV	Hose Valve
HVAC	Heating, Ventilating, and Air Conditioning
HW	Headwall/Hot Water
HWL	High Water Level
HWY	Highway
HYDR	Hydraulic
HZ	Hertz (cycles per second)
I	Intersection Angle/Instrumentation Drawings
ICBO	International Conference of Building Officials
ID	Inside Diameter
IE	Invert Elevation
IN	Inches
INCL	Include
INL	Inlet
INSUL	Insulating
INSTL	Install or Installation
INT	Interior
INTR	Intersection
INV	Invert
I/O	Inlet/Outlet
IP	Iron Pipe
IPS	Iron Pipe Size
IPT	Iron Pipe Thread
IRR	Irrigation
JB	Junction Box
JCT	Junction
JN	Join
JT	Joint
KG	Kilogram
KM	Kilometer
KIPS	Thousands of Pounds

ABBREVIATION	TERMS
KPA	Kilopascal
KV	Kilovolt
KW	Kilowatt
KWH	Kilowatt-Hour
KWHM	Kilowatt-Hour Meter
L	Length of Curve/Long/Landscaping Drawings
LATL	Lateral
LB	Pound
LCL	Local
LF	Linear Foot
LNDSCP	Landscaping
LOCN	Location
LP	Light Pole
LPT	Low Point
LR	Long Radius
LS	Lift Station
LT	Left/Light
LWC	Lightweight Concrete
LWIC	Lightweight Insulating Concrete
LWL	Low Water Level
M	Mechanical Drawings/Meter
MATL	Material
MAX	Maximum
MB	Machine Bolt/Megabyte/Millibars
MC	Metal Channel
MCM	Thousand Circular Mils
ME	Machined End
MECH	Mechanical
MFR	Manufacturer
MG	Million Gallons / mg = milligram
MGD	Million Gallons Per Day
MH	Manhole
MHZ	Megahertz
MI	Malleable Iron/Mile
MIL	Military Specifications
MIL-	Military Specification (leading symbol)
MIN	Minimum
MIP	Male Iron Pipe Thread
MISC	Miscellaneous
MJ	Mechanical Joint
MM	Millimeter
MO	Motor Operator/Motor Operated/Masonry Opening
MOD	Modification
MON	Monument
MOT	Motor
MOV	Motor Operated Valve
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
MTD	Mounted
N	North/Neutral/Nitrogen
NA	Not Applicable
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards

ABBREVIATION	TERMS
N & C	Nail and Cap
NC	Normally Closed
NCV	Normally Closed Valve
NE	Northeast
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
NIC	Not in Contract
NIP	Nipple
NO	Number/Normally Open
NOM	Nominal
NPT	National Pipe Taper
NRS	Non-Rising Stem
NSF	National Sanitation Foundation
NTS	Not to Scale
NW	Northwest
NWL	Normal Water Level
OA	Overall/Outside Air
OC	On Center/Overcurrent
OD	Outside Diameter
OE	Or Equal
OF	Outside Face
OFCI	Owner-Furnished Contractor-Installed
OFCR	Owner-Furnished Contractor-Relocated
OPER	Operator
OPNG	Opening
OPP	Opposite
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor, as defined in the General Conditions
O TO O	Out to Out
OUTL	Outlet
OVFL	Overflow
OVHD	Overhead
P	Pole
PARA	Paragraph
PB	Push Button/Pull Box
PC	Point of Curvature/Programmable Controller
PCA	Portland Cement Association
PCC	Point of Compound Curvature/Portland Cement Concrete
PDMWD	Padre Dam Municipal Water District
PE	Plain End/Polyethylene/Professional Engineer
PEN	Penetration
PG	Pressure Gage
PI	Point of Intersection
PJTN	Projection
PKWY	Parkway
PL	Plate/Property Line
PLATF	Platform
PLF	Pounds per Lineal Foot
PM	Parcel Map
PNL	Panel
PO	Push-On

ABBREVIATION	TERMS
POB	Point of Beginning
POC	Point of Connection
PE	Polyethylene
POR	Portion
PP	Power Pole/Polypropylene
PPB	Parts Per Billion
PPM	Parts Per Million
PR	Pair
PRC	Point of Reverse Curve
PRESS	Pressure
PRL	Parallel
PRPSD	Proposed
PRVC	Point of Reverse Vertical Curve
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gage
PSF	Pounds Per Square Foot
PT	Point of Tangency
PV	Plug Valve
PVC	Polyvinyl Chloride/Point of Vertical Curvature
PVI	Point of Vertical Intersect
PVMT	Pavement
PWR	Power
Q	Flow Rate
QTY	Quantity
R	Right/Radius
RAF	Return Air Fan
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
RD	Road
RDC	Reduce
RDCR	Reducer
RDWY	Roadway
REF	Reference
REINF	Reinforce or Reinforced
RELOC	Relocate
REQD	Required
RES	Reservoir
REV	Revise/Revision
RF	Raised Face
RH	Relative Humidity
RJ	Restrained Joint
RND	Round
RM	Record Map
ROS	Record of Survey
RPM	Revolutions Per Minute
RS	Road Survey
RSD	Regional Standard Drawings
RST	Reinforcing Steel
RT	Right
R/W	Right-of-Way
RWGV	Resilient-Wedge Gate Valve

ABBREVIATION	TERMS
S	South
SAE	Society of Automotive Engineers
SAN	Sanitary
SC	Seal Coat
SCADA	Supervisory Control and Data Acquisition
SCFM	Standard Cubic Feet Per Minute
SCHED	Schedule
SCRN	Screen
SD	Storm Drain
SD CO	San Diego County
SDG	Siding
SE	Southeast
SECT	Section
SF	Square Feet
SGL	Single
SH	Sheet/Sheeting/Shielded
SHT	Sheet
SIM	Similar
SKWK	Sidewalk
SLP	Slope
SLV	Sleeve
SM	Sheet Metal
SOL	Solenoid
SOV	Solenoid-Operated Valve
SP	Space/Steel Pipe/Static Pressure/Spare/Stand Pipe
SPCG	Spacing
SPEC	Specification
SPLC	Splice
SPRT	Support
SQ	Square
SS	Sanitary Sewer
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
SS	Stainless Steel
ST	Street
STA	Station
STBY	Standby
STD	Standard
STK	Stake
STL	Steel
STR	Straight
STRL	Structural
STRUCT	Structure
STS	Storm Sewer
SURF	Surface
SW	Southwest
SWG	Swing
SYMM	Symmetrical
SYS	System
T	Ton/Tangent Length of Curve
TAN	Tangent
T/B	Top of Beam
TB	Top of Bank/Terminal Board
T&B	Top and Bottom

ABBREVIATION	TERMS
TBG	Tubing
TBM	Temporary Bench Mark
TC	Top of Curb
TDH	Total Dynamic Head
TDS	Total Dissolved Solids
TEL	Telephone
TEMP	Temperature/Temporary
THB	Thrust Block
THD	Thread or Threaded
THH	Thrust Harness
THK	Thick
TO	Turnout
T/O	Top of
TOC	Top of Concrete/Top of Curb
TOP	Top of Pipe
TOS	Top of Slab
TOT	Total
TP	Telephone Pole
TRD	Thread
TRA	Tie Rod Assembly
TS	Tube Sheet
TYP	Typical
UBC	Uniform Building Code
UD	Underdrain
UG	Underground
UL	Underwriters Laboratories, Inc.
ULT	Ultimate
UON	Unless Otherwise Noted
UPC	Uniform Plumbing Code
UTC	Underground Telephone Cable
UTIL	Utilities
V	Vent/Valve/Volt/Vertical
VAC	Vacuum/Volts, Alternating Current
VC	Vertical Curve
VEL	Velocity
VERT	Vertical
VFD	Variable Frequency Drive
VOL	Volume
VPC	Vertical Point of Curve
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangency
W	West/Watt/Wide/Water/Wire
W/	With
WADG	Water Agencies' Design Guide
WAS	Water Agencies' Standards
WASC	Water Agencies' Standards Committee
WE	Weld End
WG	Water Gage
WL	Waterline
WLD	Welded
WM	Water Meter
W/O	Without
WP	Waterproof/Working Point

ABBREVIATION	TERMS
WSE	Water Surface Elevation
WSP	Water Stop
WT	Weight
WTR	Water
WWF	Welded Wire Fabric
WWM	Woven Wire Mesh
WWR	Welded Wire Reinforcement
YCO	Yard Cleanout
YD	Yard
YP	Yield Point
YR	Year
YS	Yield Strength

PART 2 MATERIALS

"NOT USED"

PART 3 EXECUTION

"NOT USED"

END OF SECTION

SECTION 01115

CONSTRUCTION SEQUENCE

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

The Work of this Section shall include, but not be limited to, furnishing all schedules, copies, updates and all other items required to complete the Project in accordance to the Contract Documents.

1.2 CONTRACTOR SUBMITTALS

A. Within 30 days from the Notice to Proceed, the Contractor shall submit a detailed written sequencing and shutdown plan, including a schedule that describes the Contractor's proposed work schedule and sequence of work to complete the specified work. The shutdown plan shall clearly identify all required shutdowns in order to install new equipment taking into consideration the conditions and constraints identified in Section 1.3. The Contractor shall be responsible for managing and disposal of all water derived from pipeline draining, flushing, and/or any other activity associated with this project. The shutdown plan shall include a detailed plan for management of the pipeline drainage / flushing water, and all other water, including a discussion on all permitting required and proposed drainage control strategy. The Contractor shall not be allowed to start any work activities involving shutdown of existing facilities without the District's prior approval of the written sequencing and shutdown plan.

B. The construction schedule shall include the following as a minimum:

1. The order that the work shall be done and the total duration required for each segment.

2. Demo schedule that includes the planned District Shutdown schedule.

3. Entire Pump Station shall be constructed, connected and in operation before the existing pump station is demoed. Pumps and system shutdowns shall be limited to tie-in operations and 6 hours.

1.3 SEQUENCE OF WORK

A. The Contractor sequencing and shutdown plans shall be prepared based on the following conditions and constraints:

1. The Contractor shall not close or open any existing isolation valves, meter valves, air release valves, blow offs, fire hydrants, or other distribution system appurtenances. District staff shall be responsible for the operation of the valves and appurtenances required to isolate the existing facility to allow for the shutdown and construction work. The contractor shall provide the District with two-weeks advance notice for any planned shutdown work. This will enable the District to schedule the resources needed to accommodate the planned shutdown.

B. In order to minimize shutdown during construction, a Schedule will be developed for all demolition, construction, tie-in and start-up activities. Procedural steps, time and scheduling constraints will be outlined within each activity to assist the CONTRACTOR in developing a sequence of Work and timing in order to minimize the shutdowns.

1. The CONTRACTOR shall develop a detailed description of the complete sequence for all construction events contained herein. The construction constraints and requirements described in this Section must be used as a guideline in preparing the schedule.

2. The preliminary sequences shall be submitted to the ENGINEER for review and approval fourteen (14) calendar days before a specific event is commenced. The detailed plan shall describe the CONTRACTOR'S length of time required to complete the required construction events which the CONTRACTOR shall complete to ensure proper operation of the affected facilities.

3. The detailed plan shall be submitted to the ENGINEER for review and approval seven (7) calendar days before the specific tie-in Work begins. In addition, the plan shall describe the CONTRACTOR'S contingency plan that shall be initiated in the event that it becomes apparent that the time constraints cannot be met. The contingency plan shall conform to all specified outage requirements. All costs for preparing and implementing both the shutdown and contingency plans shall be borne by the CONTRACTOR.

4. The CONTRACTOR shall notify the ENGINEER/ OWNER in writing at least seven (7) calendar days in advance of the required Shutdown if the schedule for performing the Work has changed or if revisions to the schedule are required.

5. The CONTRACTOR shall provide written confirmation of the shutdown date and time seven (7) calendar days prior to the actual outage. The CONTRACTOR, at his/her own expense, shall provide temporary power generators whenever and wherever necessary to ensure a continuous power supply to all plant facilities.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01291

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Submit to ENGINEER for acceptance a Schedule of Values that allocates cost to each item of the Work. Schedule of Value list of line items shall correspond to each aspect of the Work, establishing in detail the portion of the Contract Price allocated to each major component of the Work.

B. Upon request of ENGINEER, support values with data that substantiate their correctness.

C. Submit preliminary Schedule of Values to ENGINEER for initial review. CONTRACTOR shall incorporate ENGINEER's comments into the Schedule of Values and resubmit to ENGINEER. ENGINEER may require corrections and re-submittals until Schedule of Values is acceptable.

D. Schedule of Values and the Progress Schedule updates specified in Section 01321, Progress Schedule, shall be basis for preparing each Application for Payment. Schedule of Values may be used as a basis for negotiating price of changes, if any, in the Work.

E. Include in Schedule of Values unit price payment items with their associated quantity. Provide in the Schedule of Values detailed breakdown of unit prices when required by ENGINEER.

F. Requirements for preliminary Schedule of Values and Schedule of Values are:

1. Schedule of Values shall show division of Work between CONTRACTOR and Subcontractors. Line items for Work to be done by Subcontractor shall include the word, "(SUBCONTRACTED)".

2. Schedule of Values shall include breakdown of costs for materials and equipment, installation, and other costs used in preparing the Bid by CONTRACTOR and each Subcontractor. List purchase and delivery costs for materials and equipment for which CONTRACTOR may apply for payment as stored materials.

3. Include separate amounts for each Specification Section in the Contract Documents by structure, building, and work area.

4. Identify each line item with number corresponding to the associated Specification Section number. List sub-items of major products or systems, as appropriate or when requested by ENGINEER.

5. Sum of individual values shown on the Schedule of Values shall equal the total of associated payment item. Sum of payment item totals in the Schedule of Values shall equal the Contract Price.

6. Include in each line item a directly proportional amount of CONTRACTOR's overhead and profit. Do not include overhead and profit as separate item(s).

7. Include separate line item for each allowance, and for each unit price item.

8. Include line item for bonds and insurance, in amount not exceeding 2.0 percent of the Contract Price. This may be applied for in the first Application for Payment.

9. Include items for the General Conditions, permits (when applicable), construction Progress Schedule, and other items required by ENGINEER. Include such items in Applications for Payment on schedule accepted by ENGINEER

10. Line items for Site maintenance such as dust control, compliance with storm water pollution prevention plans and permits, spill prevention control and countermeasures plans, and for construction photographic documentation; temporary utilities and temporary facilities, field offices, temporary controls, field engineering, and similar Work shall be included in the Schedule of Values and proportioned in Applications for Payment throughout duration of the Work.

11. Include separate line items under each appropriate payment item for mobilization and demobilization. Document for ENGINEER the activities included in mobilization and demobilization line items.
    a. Mobilization will be limited to 2 percent of the Contract Price, and will be paid in 2 payments, each of 50 percent of total amount for mobilization.
    b. Demobilization shall be at least 2 percent of the Contract Price and shall be included with the Application for Payment following Substantial Completion, or other schedule accepted by ENGINEER.

12. Costs for submittals, operations and maintenance manuals, field testing, and training of operations and maintenance personnel shall be as follows, unless otherwise accepted by ENGINEER:
    a. Up to eight percent of material cost (including overhead and profit) of each item may be allocated to preparation of submittals and may be included in the Application for Payment following ENGINEER's approval of Shop Drawings (and acceptance of other submittals, as applicable) required for fabricating or purchasing for that item for the Work.
    b. Up to three percent of total cost of each item (including overhead and profit), including materials and equipment, and installation, may be apportioned to testing and included in the Application for Payment following ENGINEER's acceptance of the associated written field testing report(s).
    c. Up to a total of four percent of material cost (including overhead and profit) of each item may be apportioned to operations and maintenance manuals and training of operations and maintenance personnel, which may be included in the Application for Payment following completion of training for that item.

13. Submit Schedule of Values on 8.5-inch by 11-inch white paper, using the continuation sheets of the Application for Payment.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Submit to ENGINEER 3 copies of Schedule of Values.

2. Content of Schedule of Values submittals shall conform to Article 1.1 of this Section.

3. Time Frames for Submittals:
   a. Submit preliminary Schedule of Values within ten days of date that the Contract Times commence running in accordance with the Notice to Proceed.
   b. Submittal of the Schedule of Values shall be in accordance with the General Conditions. ENGINEER will not accept Applications for Payment without an acceptable Schedule of Values.
   c. When required by ENGINEER, promptly submit updated Schedule of Values to include cost breakdowns for changes in the Contract Price.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01311

PROJECT COORDINATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. As more fully set forth in of the General Conditions, CONTRACTOR shall coordinate the Work, including his Subcontractors and Suppliers, as required to complete the Work within the Contract Times.

B. As set forth in the General Conditions, CONTRACTOR shall cooperate with and coordinate the Work with other CONTRACTORS, including utility service companies or OWNER'S employees performing Work at the Site.

C. CONTRACTOR will not be responsible or liable for damage unless it is through the negligence of CONTRACTOR.

D. CONTRACTOR shall also coordinate the Work with the others to assure compliance with schedules.

E. CONTRACTOR shall attend and participate in all project coordination and progress meetings and report on the progress of all Work and compliance with Progress Schedules.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01312

PROGRESS MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Progress meetings will be held throughout the Project. CONTRACTOR shall attend each meeting prepared to discuss all items on the agenda. The representatives present for each party shall be authorized to act on their behalf.

B. Date and Time:
   1. Regular Meetings: Bi-weekly on a day and time agreeable to OWNER, ENGINEER, and CONTRACTOR.
   2. Other Meetings: As required.

C. Place: FPUD office.

D. OWNER will preside at meetings and prepare and distribute meeting minutes to all meeting participants and others as requested.

E. CONTRACTOR shall provide data required including, at each meeting, a minimum of five (5) copies of each of the following handouts:
   1. List of work accomplished since the previous meeting.
   2. Schedule of Work (with specific starting and ending dates for each task) planned until the next meeting.
   3. “Look-ahead” schedule of Work for major shutdowns, major equipment installations, and other important Milestones.
   4. When applicable, list of upcoming, planned time off (with dates) for personnel with significant roles on the Project, and the designated contact person in their absence.

1.2 MINIMUM ATTENDANCE

A. CONTRACTOR:
   1. CONTRACTOR’S project manager.
   2. CONTRACTOR’S site superintendent.
   3. When needed for the discussion of a particular agenda item, CONTRACTOR shall require representatives of Subcontractors or Suppliers to attend a meeting.

B. OWNER's representative, as required.

C. Others, as appropriate.

1.3 AGENDA

A. Agenda will include, but will not necessarily be limited to, the following:
   1. Review and comment on minutes of previous meeting.
   2. Review of progress since the previous meeting.
   3. Planned progress and shutdowns for next period.
   4. Review of overall project schedule, including off-site fabrication and delivery schedules and corrective measures, if required.
   5. Review of status of critical submittals, including Shop Drawings and Applications for Payment.
   6. Review of CONTRACTOR Requests for Information (RFI).
   7. Review of change issues and change orders.
   8. Problems, conflicts and observations.
   9. Quality standards and control.
   10. Coordination between parties.
   11. Safety concerns.
   12. Permits.
   13. Construction photographs.
   14. Record drawings.
   15. Punch list status.
   16. Other business.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01321

PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section describes the Progress Schedule requirements to be performed by CONTRACTOR.

B. ENGINEER's acceptance of the Progress Schedule, and comments or opinions concerning the various scheduling documents and reports shall not control CONTRACTOR's independent judgment concerning means, methods, techniques, sequences and procedures of construction that CONTRACTOR employs. CONTRACTOR is solely responsible for meeting the Contract Time(s).

C. Payment for progress or mobilization will not be paid to CONTRACTOR until the 90-day Bar Chart is accepted. Refer to Paragraph 1.2.A., below.

D. All Activities of CONTRACTOR shall be scheduled and monitored by use of a Bar Chart Progress Schedule. CONTRACTOR shall provide a Bar Chart Progress Schedule for Work done under this Contract, in accordance with this Section, and the sequence and progress of the Work requirements included under Section 01110 - Summary of Work, Section 01115 – Construction Sequence, and the Construction Sequence Diagram.

E. In the preparation of the Progress Schedule, CONTRACTOR shall take into consideration submittal requirements and approval time, delivery times for equipment and materials, Subcontractors' work, availability and abilities of workman, weather conditions, any restrictions in operations at the Site, and all other factors that may affect completion of the Work within the Contract Times.

F. In addition to construction, network Activities shall include the submittal and approval of samples of materials, Shop Drawings and fabrication of special materials. It shall include collection and submittal of all documents and proofs of compliance required by the Contract Documents for final inspection and acceptance of the Work.

1.2 PROGRESS SCHEDULE SUBMITTAL

A. No later than 28 calendar days after the Notice to Proceed, CONTRACTOR shall submit to the ENGINEER the complete Progress Schedule in Bar Chart format. The first submittal of the Progress Schedule is the preliminary Progress Schedule. ENGINEER and CONTRACTOR shall meet bi-weekly to review the progress of the development of the Progress Schedule. Lack of progress in the development of the Progress Schedule shall be cause for suspension of any progress payment. The Progress Schedule will be reviewed by the ENGINEER within 14 calendar days of

receipt or request for adjustment. A meeting, or meetings, may be required with the CONTRACTOR during this period in order to expedite acceptance or adjustment. Any adjustments required after this period shall be made and resubmitted by CONTRACTOR within 14 calendar days.

B. If, in the preparation of the Progress Schedule, CONTRACTOR reflects a completion date or milestone date different than that specified in the Contract Documents, this in no way voids the dates set therein. The dates as specified in the Contract Documents govern. Where the Progress Schedule reflects a completion date or milestone date earlier than specified, the ENGINEER may accept such Progress Schedule with CONTRACTOR specifically understanding that no claim for an adjustment in Contract Times or Contract Price shall be brought against the OWNER as the result of CONRACTOR's failure to complete the Work by the earlier date shown on the Progress Schedule.

1.3 UPDATING THE PROGRESS SCHEDULE

A. Updates:
   1. CONTRACTOR shall update the Bar Chart Schedule on a monthly basis.
   2. Revisions and additions to the accepted progress schedule shall be submitted in PDF format.

1.4 TIME IMPACT ANALYSIS FOR CHANGE ORDERS, DELAYS, AND TIME EXTENSIONS

A. Change Orders, Delays, and Time Extensions:
   1. When a Change Order is proposed by the ENGINEER or CONTRACTOR, or delays are experienced, CONTRACTOR shall submit a Time Impact Analysis illustrating the influence of each Change Order or delay on any specified intermediate Milestone date(s) or Contract completion date. Each Time Impact Analysis shall demonstrate how the CONTRACTOR proposes to incorporate the change(s) or delay(s) into the Progress Schedule.

B. Submittal:
   1. Each Time Impact Analysis shall be submitted within 3 calendar days after a delay occurs or a notice of change or proposed Change Order is given to CONTRACTOR. In cases where CONTRACTOR does not submit a Time Impact Analysis for a specific change or delay within the specified period of time, it shall be mutually agreed that no time extension is required.

C. Evaluation:
   1. Final evaluation of each Time Impact Analysis by the ENGINEER will be made within 7 calendar days after receipt, unless subsequent meetings and negotiations are necessary. Adjustments in the Contract Times will be made only by Change Order.

1.5 RECOVERY SCHEDULE

A. In the event that an updated Progress Schedule indicates that the Project, or a Milestone requirement, falls 14 or more work days behind schedule and there is no excusable delay or change to support a time extension, CONTRACTOR shall prepare and submit a Recovery Schedule for acceptance by the ENGINEER. CONTRACTOR shall revise logic or durations to show the Project on schedule. The Recovery Schedule shall be submitted 7 calendar days after the updated Progress Schedule is submitted.

B. CONTRACTOR shall provide additional manpower, equipment, or materials or shall work additional shifts, or expedite procurement to complete Activities within the specified Milestones or Contract Times, at no additional cost to the OWNER. Upon acceptance of the Recovery Schedule by the ENGINEER, CONTRACTOR shall incorporate it into the current Progress Schedule.

C. Lack of Action:

1. CONTRACTOR's refusal, failure, or neglect to take appropriate recovery action or to submit a written Recovery Schedule shall constitute reasonable evidence that CONTRACTOR is not prosecuting the Work, or separable part, with the diligence that will ensure its completion within the applicable Contract Times. Such lack of action shall constitute sufficient basis for the OWNER to exercise remedies available under the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01620

PRODUCT OPTIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR's options for selection of products.
   2. Requirements for consideration of "or-equal" products.

1.2 PRODUCT OPTIONS

A. For products specified only by reference standard or description, without reference to Supplier, provide products meeting that standard, by any Supplier or from any source that complies with the Contract Documents.

B. For products specified by naming one or more products or Suppliers, provide the named products that comply with the Contract Documents, unless an "or-equal" or substitute product is approved by ENGINEER.

C. For products specified by naming one or more products or Suppliers and the term, "or equal", when CONTRACTOR proposes a product or Supplier as an "or equal", submit to ENGINEER a request for approval of an "or equal" product or Supplier in accordance with Section 1 of the General Provisions.

1.3 "OR EQUAL" PRODUCTS

A. For proposed products not named in the Contract Documents and considered as an "or equal" as defined in the General Conditions, CONTRACTOR shall request in writing ENGINEER's approval of the "or equal". Request for approval of an "or equal" product shall accompany the Shop Drawing submittal for the proposed product and shall include:

   1. CONTRACTOR's request that the proposed product be considered as an "or equal" per the General Conditions, accompanied by CONTRACTOR's certifications as required in the General Conditions.

   2. Documentation adequate to show that proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents, and will produce the indicated results and performance, and that it is compatible with other portions of the Work.

   3. Detailed comparison of significant qualities of proposed product with those named in the Contract Documents. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements specified.

4. Evidence that proposed product provides warranty equal to or better than specified.
5. List of similar installations for completed projects with project names and addresses, and names and address of design professionals and owners, if requested.

6. Samples, if requested.

7. Other information requested by ENGINEER.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02050

DEMOLITION

PART 1 GENERAL

1.01 WORK OF THIS SECTION

A. The CONTRACTOR shall furnish all materials, equipment, and labor necessary to perform and complete demolition of existing valves, piping, appurtenances, pavement, sidewalk, curb and gutter, etc.

1.02 RELATED SECTIONS

Specification Section 01000,

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. The WORK of this Section shall comply with the current edition of the Uniform Building Code.

B. Except as otherwise indicated in this Section, the CONTRACTOR shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC).

1.04 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit a demolition schedule which shall provide a complete coordination schedule for demolition work including shut-off and continuation of utility services before the start of the demolition. The schedule shall indicate proposed methods and operations of facility demolition, and provide a detailed sequence of demolition and removal work to ensure uninterrupted operation of occupied areas.

B. Before completion of the Work, the CONTRACTOR shall submit an Affidavit of Legal Disposal attesting to the lawful disposal of all demolished materials.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL

A. Structures shall be demolished and removed in compliance with SSPWC subsection 306-5 and the requirements indicated herein.

3.02 POLLUTION CONTROL

A. Water sprinkling, temporary enclosures, chutes, and other suitable methods shall be used for dust suppression in compliance with SSPWC Section 7.

B. Water shall not be used when it creates hazardous or objectionable conditions such as flooding, erosion, sedimentation, or pollution.

3.03 PROTECTION

A. Safe passage of persons around the area of demolition shall be provided. Operations shall be conducted to prevent injury to people and damage to adjacent buildings, structures, and other facilities in compliance with SSPWC Section 7.

B. Interior and exterior shoring, bracing, or supports shall be provided to prevent movement, settlement or collapse of structures to be demolished.

C. Existing landscaping materials, structures, and appurtenances which are not to be demolished shall be protected and maintained as necessary and in accordance with SSPWC Section 7.

D. Unless otherwise indicated, the CONTRACTOR shall protect and maintain all utilities in the proximity of the facilities to be demolished.

E. The CONTRACTOR shall protect nearby existing equipment from dust caused by demolition activities by covering, drop-curtains, and other similar methods.

3.04 DISPOSAL OF NON-FRIABLE ASBESTOS

A. If non-friable asbestos cement pipe (ACP) is identified, the CONTRACTOR shall employ adequate care to maintain the pipe in a non-friable condition. Removal of ACP shall be in whole sections where possible. Cutting or breaking of ACP to facilitate removal shall be in compliance with California Regulations, Title 8, Section 5208. At a minimum, the CONTRACTOR shall follow the following requirements for ACP that is to be cut or broken:

1. The CONTRACTOR shall evacuate the area of unauthorized and untrained personnel, post warning signs, and provide a demarcation zone and adequate barriers to keep unauthorized personnel out of the area.

2. The CONTRACTOR shall provide personal protective equipment consisting at least of a respirator and disposable clothing to asbestos accredited workers performing the cutting or breaking of ACP. Respiratory protection shall be in accordance with the requirements of California Regulations, Title 8, Section 5414.

3. The area to be cut or broken shall be adequately wetted with amended water to reduce fiber emission. The method employed by the CONTRACTOR shall minimize fiber release. Power saw cutting will not be allowed. All related debris from the cutting or breaking of ACP shall be considered friable. The CONTRACTOR shall dispose of friable material in accordance with California Regulations Title 22.

4. All waste generated and ACP shall be wrapped in 6 mil polyethylene sheeting or bags and shall be properly transported and disposed of.

3.05 DISPOSAL OF FRIABLE ASBESTOS

A. Friable asbestos-containing material is defined as material that can be crumbled, pulverized, or reduced to powder by hand pressure. All friable asbestos-containing materials shall be considered as hazardous waste and shall be transported by a licensed hazardous waste hauler. Friable asbestos containing materials shall be disposed of at an approved hazardous waste landfill.

B. Upon discovery of friable asbestos, the CONTRACTOR shall immediately notify the CONSTRUCTION MANAGER.

3.06 BELOW-GRADE DEMOLITION

A. All pipes must be confirmed out of service by District before cutting.
B. Structures designated on the plans to be removed shall be removed to the full depth of the structure, including its foundation.

C. Contractor shall install temporary bulkheads & valves as required for construction sequencing.

D. Below-grade areas and voids resulting from demolition of structures shall be completely filled to a minimum compaction of 95%.

E. After fill and compaction, surfaces shall be graded to meet adjacent contours and to provide flow to surface drainage structures, or as indicated.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. Demolition and removal of debris shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the DISTRICT. Alternate routes shall be provided around closed or obstructed traffic ways.

B. Site debris, rubbish, and other materials resulting from demolition operations shall be removed and disposed of in compliance with all laws and regulations. Burning of removed materials from demolished structures will not be permitted.

3.08 PATCHING AND REPAIRING

A. The CONTRACTOR shall provide patching, replacing, repairing, and refinishing of damaged areas involved in demolition as necessary to match the existing adjacent areas.

B. The CONTRACTOR shall repair all damages caused to adjacent facilities by demolition at no additional cost to the DISTRICT.

3.09 CLEANING

A. During and upon completion of Work, the CONTRACTOR shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by the Work in a clean condition.

B. The CONTRACTOR shall clean adjacent structures and facilities of dust, dirt, and debris caused by demolition and return adjacent areas to condition existing prior to start of Work.

C. The CONTRACTOR shall clean and sweep the affected portions of roads, streets, sidewalks and passageways daily.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 GENERAL

1.01 WORK OF THIS SECTION

A. The CONTRACTOR shall perform site dewatering necessary to lower and control groundwater levels and hydrostatic pressures to allow excavation and construction to be performed properly under dry conditions. This Section includes materials, installation, maintenance, operation, and removal of temporary dewatering systems.

B. Dewatering operations shall be adequate to ensure the integrity of the finished project. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the CONTRACTOR. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the CONTRACTOR.

C. Contractor shall be responsible for Dewatering Pipelines and Leakage per section 01115

1.03 RELATED WORK SPECIFIED ELSEWHERE

Specification Sections 01000, 02223, 15044, 15061, 15064 and 15108.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

B. Except as otherwise indicated in this Section, the CONTRACTOR shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC).

C. The CONTRACTOR shall comply with the latest RWQCB Order (California General Dewatering Permit) requiring a permit from the RWQCB for any regulated discharge of groundwater to the environment during construction.

1.03 CONTRACTOR SUBMITTALS

A. The following shall be submitted in compliance with Section 01300 - Submittals:

1. Before starting excavation, the CONTRACTOR shall submit shop drawings including a detailed plan, schedule, and description of the dewatering of excavations. The shop drawings shall include: the proposed type of dewatering system; the arrangement, location, and depths of system components; a complete description of the equipment and instrumentation to be used, with installation, operation and maintenance procedures; a description of the CONTRACTOR's means and methods for measuring groundwater levels and piezometric water levels; and the methods for disposal of dewatering effluent.

2. Before starting excavation, the CONTRACTOR shall submit copies of well installation permits.

3. Before starting excavation, the CONTRACTOR shall submit copies of Regional Water Quality Control Board permit for dewatering discharges to the environment.

B. The CONTRACTOR shall submit a daily report that includes the following information:

1. Groundwater levels and piezometric water levels in observation wells (if any).

2 Changes in elevation of reference points as stated in subparagraph 1.5C to detect settlement in adjacent structures.

3 The average dewatering flow rate.

4 Water quality testing results as required by the Regional Water Quality Control.

1.04 QUALITY ASSURANCE

A. The CONTRACTOR shall conduct a demonstration of its proposed system and shall provide verification that adequate personnel, materials, and equipment are available.

B. The CONTRACTOR shall maintain adequate control to ensure that the stability of excavated and constructed slopes is not adversely affected by water, that erosion is controlled, and that flooding of excavations or damage to structures does not occur.

C. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, the CONTRACTOR shall establish reference points and shall observe the reference points at frequent intervals to detect any settlement which may occur.

PART 2 -- PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Dewatering, includes well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, observation wells, and other means including standby pumping equipment maintained on the jobsite continuously.

B. The CONTRACTOR shall provide piezometers for monitoring groundwater levels. The CONTRACTOR shall provide other instruments and measuring devices as required.

PART 3 -- EXECUTION

3.01 GENERAL REQUIREMENTS *(next page)*

A. The CONTRACTOR is responsible for obtaining a permit for temporary construction dewatering. A permit is required from the Regional Water Quality Control Board for any discharge of groundwater to the environment or sanitary sewer. The CONTRACTOR shall comply with Regional Water Quality Control Board Waste Discharge requirements. Before starting dewatering operations, the CONTRACTOR shall obtain authorization, as required, for the disposal of groundwater. The CONTRACTOR shall comply with all applicable sampling, testing, monitoring, and reporting requirements.

B. The CONTRACTOR shall maintain an adequate system to lower and control the groundwater to permit excavation, construction of structures, and placement of fill materials to be performed under dry conditions.

C. Sufficient dewatering equipment shall be installed to pre-drain the water-bearing strata below the bottom of foundations, drains, pipelines, sewers, and other excavations.

D. The hydrostatic head in water-bearing strata below foundations, drains, sewers, water pipelines, and other excavations shall be reduced to ensure that the water level is below the excavation surface at all times.

E. The system shall be placed into operation before excavation below groundwater level is started. The system shall be operated continuously 24 hours a day, 7 days a week until drains, sewers and structures have been constructed, fill materials have been placed, and dewatering is no longer required.

F. Dewatering shall at all times be conducted to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

G. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock at no additional cost to the DISTRICT.

H. Flotation of structures and facilities shall be prevented by maintaining a positive and continuous removal of water.

I. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand-packed and/or other means shall be used to prevent pumping of fine sands or silts from the subsurface. A continuous check shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

J. Water and debris shall be disposed of in a suitable manner in compliance with permit requirements and SSPWC Subsection 306-3.3, without damage to adjacent property. No water shall be drained into work built or under construction. Before disposal, water shall be treated in accordance with permit requirements.

K. The release of groundwater to its original level shall be performed in a manner that avoids disturbance of natural foundation soils, prevents disturbance of compacted backfill, and prevents flotation or movement of structures and pipelines.

END OF SECTION

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SECTION 02202

SLOPE PROTECTION AND EROSION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

This section includes materials and installation for slope protection and erosion control.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

ACI 301	-	Specifications for Structural Concrete for Buildings
ACI 318	-	Building Code Requirements for Reinforced Concrete
ASTM A 185	-	Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM C 90	-	Standard Specification for Load-Bearing Concrete Masonry Units
ASTM C 150	-	Standard Specification for Portland Cement
ASTM C 476	-	Standard Specification for Grout for Masonry
ASTM C 615	-	Standard Specification for Granite Dimension Stone
ASTM E 162	-	Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD Standard Drawings Typical

1.04 LOCAL AND STATE AGENCY REQUIREMENTS

Slope protection and erosion control shall be accordance with the requirements of the Agency of Jurisdiction, the Regional Standards, and the Regional Water Quality Control Board.

PART 2 MATERIALS

2.01 CUT-OFF WALLS

Cut-off walls shall be one of three types according to the Standard Drawings. The following materials are acceptable for the various configurations in the construction of the walls, as shown on the drawings:

A. Portland Cement: Cement shall be Type II per ASTM C 150.

B. Concrete: Per ACI 301. Compression strength shall be 17.2 MPa (2500 PSI) minimum (560-D-3250) with 100mm (4") slump maximum. All admixtures (i.e. air-entraining, accelerators, water-reducing or pozzolan, etc.) shall be per manufacturer's recommendations. Calcium chloride shall not be used in concrete.

C. Masonry: All masonry units shall conform to ASTM C 90, with a minimum compression strength of 10.3 MPa (1500 PSI) minimum @ 28 days.

D. Reinforcing Steel and Welded Wire Reinforcement: Bars shall be per ASTM A 615, Grade 60. Welded wire reinforcement shall be per ASTM A 185. Reinforcing steel and welded wire reinforcement shall be installed in accordance with the Standards Drawings.

E. Mortar: Mortar shall consist of 1 part Portland cement, 1/4 to 1/2 part lime putty or hydrated lime, and sand equal to 2 1/4 to 3 times the sum volumes of cement and lime used and shall conform to ASTM C 476. Mortar compressive strength shall be 12.4 MPa (1800 PSI) minimum @ 28 days.

2.02 SEED MIX (HAND SEEDED)

Where a prescribed seeding or planting palette has not already been designated by the general land-use agency for the project, a site-specific seed mixture list is to be prepared by the Contractor and presented to the District for comment and approval prior to the purchase of any seed and/or planting materials. An example of a seed mixture list for coastal sage scrub re-vegetation is as follows:

BOTANICAL NAME	COMMON NAME	Seed Mix In Kg/Hectare (lbs/acre)
Eriogonum Fasiculatum	Flat-Top Buckwheat	2.24 (2.0)
Artemisia Californica	California Sagebrush	8.97 (8.0)
Lotus Scoparius	Deerweed	5.60 (5.0)
Salvia Apiana	White Sage	1.12 (1.0)
Eriophyllum Confertiflorum	Golden Yarrow	2.24 (2.0)
Yucca Whipplei	Our Lord's Candle	0.56 (0.5)
Vulpia Muralis 'Zorro'	Zorro Fescue	8.97 (8.0)
Plantago (Insolaris) Ovata	Plantain	3.36 (3.0)
Eschscholzia Californica	California Poppy	3.36 (3.0)
Lupinus Hirsutissimus	Stinging Lupine	3.36 (3.0)
Phacelia Parryi	Bluebells	1.12 (1.0)

2.03 HYDRO SEED MIX

Not used.

PART 3 EXECUTION

3.01 SURFACE RESTORATION

A. Hand seeding and hydro seeding: Unimproved areas disturbed during the course of construction shall be reseeded by one of the following methods. Hand seeding may be used when the area to be seeded is 0.4 Hectare (1.0 acre) or less. Hydro seeding shall be used on all areas in excess of 0.4 Hectare (1.0 acre). The landscape contractor shall provide all labor, materials, tools and equipment necessary to complete all work as required.

1. Hand seeding shall be performed using the mixture listed above. Seeding shall be performed on prepared topsoil. Depending on the time of year, application of water may be required to speed germination.

2. Hydro seeding shall be performed using the mixture listed above. A landscape contractor licensed to perform this type of work shall install hydro seeding. Preparation of the topsoil and maintenance of the area after seeding shall be performed per the requirements and recommendations of the hydro-seeding contractor. The District, as shown on the Approved Drawings, may require a temporary irrigation system. Apply the hydro seed mixture in the form of slurry consisting of fiber mulch, seed, soil binder, fertilizer, and water. When hydraulically sprayed on the soil surface, the mix shall form a uniform blotter-like ground cover of seed, fertilizer, binder and fiber mulch.

B. Slope Protection:

1. Slopes from 0% to 20%:

   Apply hand seeding or hydro seeding per directions described above.

2. Slopes from 20% to 50%:

   In addition to the seeding, the following additional slope protection shall be employed:

   a. Cut-off Walls:

      Cut-off walls shall be installed in accordance with the Standard Drawings and as described below:

      Cut-off walls shall be constructed of Portland cement concrete, welded wire reinforcement, and reinforcing steel as described above. The concrete and reinforcement shall be installed per ACI 318.

      Alternate #1 - Cut-off walls may be constructed of 200mm x 200mm x 400mm (8" x 8" x 16") concrete block reinforced, each course, with #9 welded wire reinforcement and #4, grade 60,

reinforcing bars every other core. Fill all cores with 560-D-3250 concrete. Placement of reinforcing steel shall be per ACI 318.

b. Chevrons:

V-type interception ditches or chevrons shall be installed at 7.6m (25') intervals. The ditches shall be 300mm (12”) deep and shall be skewed in a down slope direction at 45^{o} on each side of the centerline of the easement (i.e. the higher end of the skewed ditch shall be at the centerline and the lower ends of the ditch shall be at the two edges of the easements).

3. Slopes over 50%:

In addition to the seeding, the following additional slope protection shall be employed:

a. Additional Seed:

Annual rye seed, at the rate of 22.4 Kg/Hectare (20 #/acre), shall be included in the seed mix.

b. Cut-off wall and blanket:

Cut-off walls and blanket shall be constructed of Portland cement concrete, welded wire reinforcement, and reinforcing steel as described above. The concrete and reinforcement shall be installed per ACI 318.

Reinforced concrete cut-off walls and the 150mm (6") thick concrete blanket shall be installed in accordance with the Standard Drawings. Block walls are not allowed on slopes over 50%.

c. Chevrons:

V-type interception ditches or chevrons shall be installed as described above.

END OF SECTION

SECTION 02223

TRENCHING, EXCAVATION, BACKFILLING, AND COMPACTING

PART 1 GENERAL

1.01 DESCRIPTION

This section includes materials, testing, and installation for trench and structure excavation, backfill, and compaction of piping, conduit, manholes, and vaults.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

ASTM C 131	-	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 150	-	Portland Cement
ASTM D 75	-	Practice for Sampling Aggregates
ASTM D 1556	-	Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	-	Test Method for Moisture-Density Relations of Soils Using a Modified Effort
ASTM D 2419	-	Test Method for Sand Equivalent Values of Soil and Fine Aggregate
ASTM D 2922	-	Test Method for Density of Soil in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	-	Test Method for Water Content of Soil and Rock in Place by Nuclear Methods
ASTM D 3776	-	Test Method for Mass Per Unit Area (Weight) of Woven Fabric
ASTM D 4253	-	Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Plate
ASTM D 4254	-	Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
ASTM D 4632	-	Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	-	Test Method for Determining the Apparent Opening Size of a Geotextile
CAL-OSHA	-	Title 8 General Industry Safety Orders

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD Standard Drawings Typical

1.04 GEOTECHNICAL TESTING

The Contractor shall engage the services of a geotechnical engineering firm or individual licensed in the State of California to monitor soil conditions during earthwork, trenching, excavation, bedding, backfill, and compaction operations. Sampling and testing procedures shall be performed in accordance with the Reference Standards and as follows:

A. The soils technician shall be present at the site during all backfill and compaction operations. Failure to have the soils technician present will subject such operations to rejection.

B. Density and optimum moisture content of soil shall be determined by the use of the sand cone method, ASTM D 1556, or nuclear density gauge method, ASTM D 2922 & D 3017. Since the composition of the pipe and the walls of the trench have an effect on the nuclear density gauge output, a minimum of 25% of the density and optimum moisture tests shall be made using the sand cone method.

C. Determine laboratory moisture-density relations of existing soil by ASTM D 1557, Method C and/or D (formerly ASTM D 4253 and ASTM D 4254).

D. Determine the relative density of cohesionless soils by ASTM D 1557, Method C and/or D (formerly ASTM D 4253 and ASTM D 4254).

E. Sample backfill material by ASTM D 75.

F. Express "relative compaction" as a percentage of the ratio of the in-place dry density to the laboratory maximum dry density.

A report of all soils tests performed shall be stamped and signed by the soils firm or individual and shall be submitted by the Contractor prior to the filing of the Notice of Completion by the District. The report shall document the sampling and testing of materials, the location and results of all tests performed, and shall certify that materials and work are in compliance with this specification.

1.05 PIPE ZONE

The Pipe Zone includes the full width of the trench from 150mm (6") below the bottom of the pipe to 300mm (12") above the top of the pipe and extends into manhole or vault excavations to the point of connection to or penetration of such structure.

1.06 TRENCH ZONE

The Trench Zone includes the portion of the trench from the top of the Pipe Zone to the bottom of the Pavement Zone in paved areas, or to the existing surface in unpaved areas, and extends into manhole or vault excavations above the Pipe Zone.

1.07 STRUCTURAL BACKFILL

Structural backfill includes any fill under concrete slabs and pads.

1.08 PAVEMENT ZONE

The Pavement Zone includes the concrete or asphalt concrete pavement and aggregate base section placed over the Trench Zone and extends into manhole or vault excavations above the Trench Zone.

1.09 PROTECTION OF EXISTING UTILITIES AND FACILITIES

The Contractor shall be responsible for the care and protection of all existing utilities, facilities, and structures that may be encountered in or near the area of the work in accordance with Section 01000.

1.10 PROTECTION OF EXISTING LANDSCAPING

The Contractor shall be responsible for the protection of all trees, shrubs, fences, irrigation, and other landscape items adjacent to or within the work area in accordance with Section 01000.

1.11 ACCESS

The Contractor shall provide continuous, unobstructed access to all driveways, water valves, hydrants, or other property or facilities within or adjacent to the work areas.

1.12 SAFETY

A. Protection of workers within trenches shall be as required by the California Labor Code and in accordance with Section 01000.

B. All excavations shall be performed in a safe manner and shall be protected and supported in accordance with CAL-OSHA regulations.

C. Barriers and traffic delineators shall be placed in accordance with the requirements of the agency having jurisdiction.

1.13 BLASTING

Blasting for excavation shall not be performed without the written permission of the District. Procedures and methods of blasting shall conform to all Federal, State, and local laws and ordinances.

1.14 EXCESS EXCAVATED MATERIAL

A. The Contractor shall remove and legally dispose of all excess excavated material and demolition debris.

B. It is the intent of these specifications that all surplus material shall be legally disposed of by the Contractor. Before acceptance of the work by District, the Contractor shall provide the District with written releases signed by all property owners with whom the Contractor has entered into agreements for disposing of excess excavated material, absolving the District from any liability connected therewith.

1.15 FILTER FABRIC

Filter fabric shall be used when excessively wet, soft, spongy, or similarly unstable material is encountered or in areas of suspected high groundwater in accordance with the soils technician's recommendation and the approval of the District Engineer.

1.16 CHANGES IN LINE AND GRADE

In the event obstructions not shown on the plans are encountered during the progress of the work, and which will require alterations to the plans, the District Engineer shall have the authority to change the plans and order the necessary deviation from the line and grade, in accordance with Section 01000. The Contractor shall not deviate from the specified line and grade without prior written approval by the District Engineer.

1.17 HYDROSTATIC TESTING

Pre-testing of the piping system may be performed for the Contractor's convenience at any time. However, the final hydrostatic pressure test shall be as described in Section 15044.

PART 2 MATERIALS

2.01 GENERAL

The Contractor shall furnish backfill material as specified below. All materials used in and above the Pipe Zone shall be capable of attaining the required relative density. Site soils are considered corrosive per Caltrans (2003) criteria.

2.02 IMPORTED GRANULAR MATERIAL - PIPE ZONE

Imported Granular Material shall be used within the Pipe Zone for installations of all pressure pipe and tubing.

The Imported Granular Material shall be quarry waste (decomposed granite) free from

organic matter. Material shall have a sand equivalent value of not less than 30 per ASTM D 2419, a coefficient of uniformity of 3 or greater, and shall conform to the following gradation:

U.S. Standard Sieve Size	Percent Passing By Weight
25mm (1”)	100
19mm (3/4”)	90 – 100
4.75mm (No. 4)	50 – 95
600µm (No. 30)	25 – 45
75µm (No. 200)	3 – 15

Native materials may not be used in lieu of Imported Granular Material within the Pipe Zone unless such native materials meet all of the requirements specified above and specific written permission has been obtained from the District Engineer.

2.03 CRUSHED ROCK - PIPE ZONE

Crushed Rock shall be not be used within the Pipe Zone.

2.04 IMPORTED GRANULAR MATERIAL - TRENCH ZONE & STRUCTURAL BACKFILL

Imported Granular Material shall be used within the Trench Zone for installations of all pressure pipe and tubing and all non-pressure pipe.

Imported Granular Material for use within the Trench Zone shall conform in all ways to Imported Granular Material specified for use within the Pipe Zone.

Native materials may not be used in lieu of Imported Granular Material within the Trench Zone unless such native materials meet all of the requirements specified for Imported Granular Material within the Pipe Zone and specific written permission has been obtained from the District Engineer.

2.05 SAND-CEMENT SLURRY

Sand-cement slurry shall consist of two sacks, 85.3kg (188 pounds) of Portland cement per cubic yard of sand and sufficient moisture for workability. District approval is required for use of sand-cement slurry as a backfill material.

2.06 FILTER FABRIC

Filter fabric shall be manufactured from polyester, nylon, or polypropylene. Material shall be of non-woven construction and shall meet the following requirements:

Grab tensile strength (ASTM D 4632):	45.4kg (100 lbs) minimum for a 25mm (1") raveled strip.
Weight (ASTM D 3776):	152.6g/m^2 (4.5 oz./yd^2)
Apparent opening size (ASTM D 4751):	0.150mm (0.006")

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. 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.

B. Organic material from clearing and grubbing operations will not be incorporated in the trench backfill and shall be removed from the project site or retained and incorporated into the topsoil.

3.02 PAVEMENT, CURB, AND SIDEWALK REMOVAL

Bituminous or concrete pavements, curbs, and sidewalks shall be removed and replaced in accordance with the requirements of the agency having jurisdiction.

3.03 DEWATERING

A. The Contractor shall provide and maintain at all times during construction ample means and devices to promptly remove and dispose of all water from any source entering excavations or other parts of the work. Dewatering shall be performed by methods that will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Dewatering methods may include well points, sump points, suitable rock or gravel placed as pipe bedding for drainage and pumping, temporary pipelines, or other means, all subject to the approval of the District Engineer. The cost of all dewatering activities shall be borne by the Contractor.

B. Sewer systems shall not be used as drains for dewatering trenches or excavations, nor for disposal of collected or accumulated groundwater, without the approval of the agency of jurisdiction.

C. Concrete shall not be poured in water, nor shall water be allowed to rise around concrete or mortar until it has set at least four hours.

D. The Contractor is responsible for meeting all Federal, State, and local laws, rules, and regulations regarding the treatment and disposal of water from dewatering operations at the construction site.

3.04 SHORING AND SHIELDING

A. The Contractor's design and installation of shoring shall be consistent with the rules, orders, and regulations of CAL-OSHA.

B. Excavations shall be shored, sheeted, and supported 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.

C. The sheeting and shoring shall be arranged so as not to place any stress on portions of the completed work until the general construction has proceeded far enough to provide ample strength.

D. Care shall be exercised in the moving or removal of trench shields, sheeting, and shoring to prevent the caving or collapse of the excavation faces being supported.

3.05 CORRECTION OF OVEREXCAVATION

Overexcavations shall be corrected by backfilling with approved imported granular material or crushed rock, compacted to 90% relative compaction, as directed by the District Engineer.

3.06 FOUNDATION STABILIZATION

A. When unsuitable soil materials are encountered, the unsuitable material shall be removed to the depth determined necessary in the field by the Soils Technician, and as acceptable to the District Engineer. The sub-grade shall be restored with compacted Imported Granular Material or crushed rock as recommended by the Soils Technician. Place the appropriate bedding or base material on this restored foundation.

B. When rock encroachment is encountered, the rock shall be removed to a point below the intended trench or excavation sub-grade as determined necessary in the field by the Soils Technician, and as acceptable to the District Engineer. The sub-grade shall be restored with compacted Imported Granular Material as recommended by the Soils Technician. Place the appropriate bedding or base material on this restored foundation.

C. When excessively wet, soft, spongy, or similarly unstable material is encountered at the surface upon which the bedding or base material is to be placed, the unsuitable material shall be removed to the depth determined necessary in the field by the Soils Technician, and as acceptable to the District Engineer. Restore the trench with crushed rock enclosed in filter fabric as directed by the District Engineer. Larger size rocks, up to 75 mm (3"), with appropriate gradation, may be used if recommended by the Soils Technician. Place the appropriate bedding or base material on this restored foundation.

3.07 TRENCH EXCAVATION AND PLACEMENT OF BEDDING

A. Excavate the trench to the lines and grades shown on the drawings with allowance for 150mm (6") of pipe bedding material. The trench section shall be as shown in the construction plans.

B. The maximum length of open trench shall be 152m (500') except by permission of the District, City or County. The distance is the collective length at any location, including open excavation and pipe laying, which has not been backfilled to the elevation of the surrounding grade.

C. Trench walls shall be sloped or shored per the requirements of CAL-OSHA.

D. The trench bottom shall be graded to provide a smooth, firm, and stable foundation that is free from rocks and other obstructions.

E. Place the specified thickness of bedding material over the full width of the trench. Grade the top of the pipe base ahead of the pipe laying to provide a firm, uniform support along the full length of pipe.

F. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint.

G. Trenches for main pipelines and all appurtenances shall be backfilled with the materials and methods as specified for the Pipe Zone, Trench Zone, and Pavement Zone.

H. Trench widths shall be in accordance with the Trench Detail shown in the Approved Plans.

I. Trench depth shall be as required to install pipelines in accordance with the Approved Plans and the Water Agencies' Design Guide. Unless shown otherwise on the Approved Plans, the minimum depth of cover for pipelines shall be as follows:

Pipeline Type	Minimum Cover Required
Potable Water	0.91m (48")
Recycled Water	1.22m (48")
Sewer	1.52m (60")

J. Final street sub-grade shall be established prior to the excavation of pipeline trenches. Minimum cover above pipe shall be 24" for hydrotesting.

3.08 STRUCTURAL FILL EXCAVATION

A. The Contractor shall place 12" of Imported Granular material under structures and Concrete slabs.

3.09 MANHOLE AND VAULTS

A. The Contractor shall prepare an excavation large enough to accommodate the structure and permit grouting of openings and backfilling operations. The walls of the excavation shall be sloped or shored per the requirements of CAL-OSHA.

B. Manholes and vaults shall be placed at the location and elevation shown on the plans. Unless noted otherwise on the plans, they shall be placed on recompacted subgrade and 300mm (12") of compacted crushed rock base.

C. Manhole and vault excavations shall be backfilled with the materials and methods as specified for the Pipe Zone, Trench Zone and Pavement Zone.

3.10 COMPACTION REQUIREMENTS

A. Compaction shall be accomplished by mechanical means. Consolidation by water settling methods such as jetting or flooding is prohibited.

B. If the backfill fails to meet the specified relative compaction requirements; the backfill shall be reworked until the requirements are met. All necessary excavations for density tests shall be made as directed by the Soils Technician, and as acceptable to the District Engineer. The requirements of the Agency having jurisdiction shall prevail on all public roads.

C. Compaction tests shall be performed at random depths, and at random intervals not to exceed 45m (150'), as directed by the Soils Technician or District Engineer.

D. Relative compaction shall be determined by the impact or field compaction test made in accordance with ASTM D 1557 Procedure C.

E. 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 follows:

1. Pipe Zone - 90% relative compaction.

2. Trench Zone - 90% relative compaction.

3. Structural section in paved areas - per agency requirements, 95% minimum.

4. Imported Granular Material for over excavation or foundation stabilization or structural backfill - 90% relative density.

F. All excavations are subject to compaction tests.

G. Backfill lift thickness shall not exceed 8” in loose thickness unless approved by the engineer.

3.11 PIPE ZONE BACKFILL

A. Care shall be taken in placing the imported granular backfill material simultaneously around the main pipeline and appurtenance pipes so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe or on the sides of the pipe. Care shall be taken to place material simultaneously on both sides of the pipe to prevent lateral movement. This area shall be mechanically compacted to attain 90% relative density. Care shall be taken when compacting appurtenance laterals 50mm (2”) and smaller to prevent the crushing or denting of the copper lateral. Additional lifts of 300mm (12") or less thickness may be required on 400mm (16") or larger diameter pipe to attain complete support of the haunch area. Soils tests may be taken on this layer of backfill.

B. After the spring line backfill has been approved by the Soils Technician, backfill of the remainder of the Pipe Zone may proceed. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe.

C. Place and compact the imported granular material at a maximum of 8” lifts. Compact all material placed in the Pipe Zone by mechanical methods. Sand cone tests shall be taken on this layer of backfill.

D. The use of a backhoe-mounted compaction wheel is prohibited within the Pipe Zone to 300mm (12”) above the top of the pipe.

E. Under no circumstances shall consolidation by water settling or water-setting methods (i.e., jetting, diking, etc.) be permitted.

3.12 TRENCH ZONE BACKFILL AND STRUCTURAL BACKFILL

A. After the Pipe Zone material has been placed, compacted, approved by the Soil Technician and accepted by the District Engineer, backfill in the Trench Zone may proceed.

B. Compaction using vibratory equipment, tamping rollers, pneumatic tire rollers, or other mechanical tampers shall be performed 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, fitting, manhole, or structure damaged by the installation operations as directed by the District Engineer.

3.13 PAVEMENT ZONE BACKFILL AND RESTORATION

A. After the Trench Zone material has been placed, compacted, approved by the Soil Technician, and accepted by the District Engineer; backfill in the Pavement Zone may proceed as necessary in accordance with the requirements of the agency having jurisdiction.

B. Replace bituminous and concrete pavement, curbs, and sidewalks removed or damaged during construction in accordance with the requirements of the agency having jurisdiction.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION

This section describes materials and methods for formwork, reinforcement, mixing, placement, curing and repairs of concrete, and the use of cementations materials and other related products. This section includes concrete, mortar, grout, reinforcement, thrust and anchor blocks, valve support blocks and manhole bases.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

ASTM A 185	Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 615/A 615M	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 150	Specification for Portland Cement
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 881	Specification for Epoxy-Resin-Base Bonding Systems for Concrete
CRSI	Recommended Practice for Placing Reinforcing Bars
SSPWC	Standard Specifications for Public Works Construction "Greenbook" (Current Version)

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD	Standard Drawings
Section 02223	Trenching, Backfilling and Compacting
Section 03461	Precast Concrete Manholes

1.04 APPLICATIONS

The following materials, referenced in other sections, shall be provided and installed in accordance with this specification for the applications noted below:

A. Concrete for thrust and anchor blocks for horizontal and vertical bends, ductile-iron or steel fittings, fire hydrant bury ells, and support blocks for valves 4-inch and larger, all in accordance with the Standard Drawings.

B. Concrete for collars, cradles, curbs, encasements, gutters, manhole bases, protection posts, sidewalks, splash pads, and other miscellaneous cast-in-place items.

C. Mortar for filling and finishing the joints between manhole and vault sections and setting manhole grade rings and cover frames. Mortar may also be used for

repairs of minor surface defects of no more than 1/4-inch in depth or 1/2-inch in width on non-structural, cast-in-place items such as splash pads or concrete rings around manholes. (Note that large voids, structural concrete and pipe penetrations into vaults shall be repaired with non- shrink grout; repairs to precast manholes and vaults and cast-in-place manhole bases shall be repaired with an epoxy bonding agent and repair mortar, as outlined below.)

D. Epoxy bonding agent for bonding repair mortar to concrete on repairs to damaged surfaces of precast or cast-in-place concrete manholes and vaults.

E. Repair mortar for repair to damaged surfaces of precast or cast-in-place concrete manholes and vaults. An epoxy bonding agent shall be used in conjunction with repair mortar.

F. Non-shrink grout for general purpose repair of large construction voids, pipe penetrations into vaults and grouting of base plates for equipment or structural members.

G. Epoxy adhesives for grouting of anchor bolts.

H. Protective epoxy coating for application to reinforcing steel within existing concrete structures exposed during construction.

I. Damp-proofing for application to the exterior surfaces of concrete manholes and vaults located at or below the water table or where showing evidence of moisture or seepage, and as directed by the District Engineer.

J. New construction and repairs use Con Shield MS-10,000 with Con mic Shield.

1.05 DELIVERY, STORAGE AND HANDLING

Deliver reinforcing steel to the site bundled and tagged with identification. Store on skids to keep bars clean and free of mud and debris. If contaminated, all bars shall be cleaned by wire brushing, sand blasting, or other means prior to being set in forms.

PART 2 MATERIALS

2.01 CONCRETE

A. All Portland cement concrete shall conform to the provisions of Sections 201, 202 and 303 of the Standard Specifications for Public Work Construction (Greenbook).

B. Class 560-C-3250 concrete, as described in the Greenbook, Section 201, shall be used for all applications unless otherwise directed by the District Engineer. The maximum water/cement ratio shall be 0.53 by weight, and the maximum slump shall be 4-inch.

C. In certain circumstances, rapid-setting concrete may be required. Accelerating admixtures shall conform to ASTM C-494 and may be used in the concrete mix as permitted by the District Engineer. Calcium chloride shall not be used in concrete.

D. Where concrete is needed to resist microbial induced corrosion of sewer structures an antimicrobial agent, Con^{MIC} Shield®, or approved equal, shall be used to render the concrete uninhabitable for bacterial growth. The liquid antibacterial additive shall be an EPA registered material and the registration number shall be submitted for approval prior to use in the project. The amount to be used shall be as recommended by the manufacturer of the antibacterial additive. This amount shall be included in the total water content of the concrete mix design. The additive shall be added into the concrete mix water to insure even distribution of the additive throughout the concrete mixture. A letter of certification must be submitted stating that the correct amount and correct mixing procedure was followed of all antimicrobial concrete.

2.02 REINFORCING STEEL

A. Reinforcing steel shall conform to ASTM A 615, Grade 60.

B. Fabricate reinforcing steel in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute.

2.03 WELDED WIRE FABRIC

Welded wire fabric shall conform to ASTM A 185.

2.04 TIE WIRE

Tie wire shall be 16-gage minimum, black, soft annealed.

2.05 BAR SUPPORTS

Bar supports in beams and slabs exposed to view after removal of forms shall be galvanized or plastic coated. Use concrete supports for reinforcing in concrete placed on grade.

2.06 FORMS

A. Forms shall be accurately constructed of clean lumber. The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags or holes.

B. Metal form systems may be used upon approval from the District Engineer. Include manufacturer's data for materials and installation with the request to use a metal form system.

2.07 MORTAR

Cement mortar shall consist of a mixture of Portland cement, sand and water. One (1) part cement and two (2) parts sand shall first be combined, and then thoroughly mixed with the required amount of water.

2.08 EPOXY BONDING AGENT

The epoxy bonding agent shall be an epoxy-resin-based product intended for bonding new mortar to hardened concrete and shall conform to ASTM C 881. The bonding agent shall be selected from the Approved Materials List.

2.09 REPAIR MORTAR

Repair mortar shall be a two-component, cement-based product specifically designed for structurally repairing damaged concrete surfaces. The repair mortar shall exhibit the properties of high compressive and bond strengths and low shrinkage. A medium-slump repair mortar shall be used on horizontal surfaces, and a non-sag, low-slump repair mortar shall be used on vertical or overhead surfaces. Repair mortar shall be selected from the Approved Materials List.

2.10 NON-SHRINK GROUT

Non-shrink grout shall be a non-metallic cement-based product intended for filling general construction voids or grouting of base plates for equipment or structural members. The non-shrink grout shall exhibit the properties of high compressive and bond strengths and zero shrinkage, and shall be capable of mixing to a variable viscosity ranging from a dry pack to a fluid consistency as required for the application. The non-shrink grout shall be selected from the Approved Materials List.

2.11 EPOXY ADHESIVE

Epoxy adhesive shall be a high-modulus epoxy-resin-based product intended for structural grouting of anchor bolts and dowels to concrete. The epoxy adhesives shall conform to ASTM C 881. A pourable, medium-viscosity epoxy shall be used on horizontal surfaces, and a heavy-bodied, non- sag epoxy gel shall be used on vertical surfaces. The epoxy adhesives shall be selected from the Approved Materials List.

2.12 PROTECTIVE EPOXY COATING

The protective epoxy coating shall be an epoxy-resin-based product exhibiting high bond strength to steel and concrete surfaces, and shall conform to ASTM C 881. The protective epoxy coating shall be selected from the Approved Materials List.

2.13 DAMP-PROOFING FOR CONCRETE STRUCTURES

Damp-proofing material shall consist of two (2) coats of a single-component self-priming, heavy- duty cold-applied coal tar selected from the Approved Materials List.

PART 3 EXECUTION

3.01 FORMWORK

A. The Contractor shall notify the District Engineer a minimum of one (1) working day in advance of intended placement of concrete to enable the District Engineer to check the form lines, grades, and other required items before placement of concrete.

B. The form surfaces shall be cleaned and coated with VOC compliant form release oil prior to installation. The form surfaces shall leave uniform form marks conforming to the general lines of the structure.

C. The forms shall be braced to provide sufficient strength and rigidity to hold the concrete and to withstand the necessary fluid pressure and consolidation pressures without deflection from the prescribed lines.

D. Unless otherwise indicated on the plans, all exposed sharp concrete edges shall be 1/4-inch chamfered.

3.02 REINFORCEMENT

A. Place reinforcing steel in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.

B. All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings or as directed by the District Engineer.

C. Do not straighten or re-bend reinforcing steel in a manner that will damage the material. Do not use bars with bends not shown on the drawings. All steel shall be cold bent – do not use heat.

D. All bars shall be free from rust, scale, oil, or any other coating that would reduce or destroy the bond between concrete and steel.

E. Position reinforcing steel in accordance with the Approved Plans 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 concrete coverage equal to that required of the bars. If required by the District Engineer, the Contractor shall install bars additional to those shown on the drawings for the purpose of securing reinforcement in position.

F. Place reinforcement a minimum of 2-inch clear of any metal pipe, fittings, or exposed surfaces.

G. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

H. All reinforcing steel, wire mesh, and tie wire shall be completely encased in concrete.]

I. Reinforcing steel shall not be welded unless specifically required by the Approved Plans or otherwise directed by the District Engineer.

J. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.

K. Minimum lap for all reinforcement shall be 40 bar diameters unless otherwise specified on the Approved Plans.

L. Place additional reinforcement around pipe penetrations or openings 6-inch diameter or larger. Replace cut bars with a minimum of 1/2 of the number of cut bars at each side of the opening, each face, each way, same size. Lap with the

uncut bars a minimum of 40 bar diameters past the opening dimension. Place one (1) same size diagonal bar at the four (4) diagonals of the opening at 45° to the cut bars, each face. Extend each diagonal bar a minimum of 40 bar diameters past the opening dimension.

M. 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.

N. Extend welded wire fabric to within 2-inch of the edges of slabs. Lap splices at least 1-1/2 courses of the fabric and a minimum of 6-inch. Tie laps and splices securely at ends and at least every 24-inch 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.

3.03 EMBEDDED ITEMS

All embedded items, including bolts, dowels and anchors, shall be held correctly in place in the forms before concrete is placed.

3.04 MORTAR MIXING

The quantity of water to be used in the preparation of mortar shall be only that required to produce a mixture sufficiently workable for the purpose intended. Mortar shall be used as soon as possible after mixing and shall show no visible sign of setting prior to use. Re-mixing of mortar by the addition of water after signs of setting are evident shall not be permitted.

3.05 MIXING AND PLACING CONCRETE

A. All concrete shall be placed in forms before taking its initial set.

B. No concrete shall be placed in water except with permission of the District Engineer.

C. As the concrete is placed in forms, or in rough excavations (i.e., thrust or anchor blocks), it shall be thoroughly settled and compacted throughout the entire layer by internal vibration and tamping bars.

D. All existing concrete surfaces upon which or against which new concrete is to be placed shall be roughened, thoroughly cleaned, wetted, and grouted before the new concrete is deposited.

3.06 CONCRETE FINISHING

A. Immediately upon the removal of forms, voids shall be neatly filled with cement mortar, non- shrink grout, or epoxy bonding agent and repair mortar as required for the application and as directed by the District Engineer.

B. The surfaces of concrete exposed to view shall be smooth and free from projections or depressions.

C. Exposed surfaces of concrete not placed against forms, such as horizontal or sloping surfaces, shall be Screeded to a uniform surface, steel-troweled to density the surface, and finished to a light broom finish.

3.07 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 by covering them with plastic film wrap and by keeping them damp for at least 7 days after the concrete has been placed, or by using an approved curing process. Exposed surfaces shall be protected from frost by covering with tarps for at least 5 days after placing.

3.08 REPAIRS TO DAMAGED CONCRETE SURFACES

Minor surface damage to hardened cast-in-place or precast concrete may be repaired, at the discretion of the District Engineer, using the specified materials in accordance with the manufacturer's recommendations and the following procedures:

A. Cast-in-place or precast concrete for manholes and vaults: Remove loose or deteriorated concrete to expose a fractured aggregate surface with an edge cut to a ninety degree angle to the existing surface. Clean all debris from the area, apply a 20 mil coat of epoxy bonding agent to the prepared surface, and place repair mortar while the epoxy is still wet and tacky. On horizontal surfaces, for repair depths greater than 2-inch, add aggregate to the repair mortar as recommended by the manufacturer. On vertical or overhead surfaces, for repair depths greater than 2-inch, apply the repair mortar in successive lifts, scarifying the lifts, allowing them to harden, and applying a scrub coat of the material prior to proceeding with the next lift. Cure the material as for concrete in accordance with this specification.

B. General Purpose: Remove loose and deteriorated concrete by mechanical means, sandblasting or high-pressure water blasting. Clean all debris from the area and apply non- shrink grout in a 1/4-inch minimum thickness, at the desired consistency, ranging from a dry pack, to a fluid-poured into a formed area, according to the application. Cure the material as for concrete in accordance with this specification.

3.09 EPOXY ADHESIVES FOR ANCHOR BOLT INSTALLATION

Anchor bolts grouted in place with an epoxy adhesive shall be installed using the specified materials in accordance with the manufacturer's recommendations and the following general procedures: Drill the hole with a rotary percussion drill to produce a rough, unpolished hole surface. The hole shall be sized to the manufacturer's recommendations and shall be approximately 1/4- inch wider than the diameter of the bolt, with a depth equal to 10 to 15 times the bolt diameter. Remove debris and dust with a stiff bristle brush and clean using compressed air. Utilizing a medium-viscosity epoxy for horizontal surfaces, and a gel-type non-sag epoxy for vertical surfaces, apply the material to fill the hole to approximately half its depth. Insert the bolt, forcing it down until the required embedment depth and projection length are attained and then twist the bolt to establish a bond. Secure the bolt firmly in place in the permanent position until the epoxy sets.

3.10 PROTECTIVE EPOXY COATING

Following core drilling at existing concrete structures, clean the exposed concrete surface and ends of reinforcing steel and apply two (2) coats of protective epoxy coating for a total dry film thickness of 10-15 mils. Allow the material to cure between coats and prior to continuing the installation through the penetration.

3.11 DAMP-PROOFING THE EXTERIOR OF CONCRETE STRUCTURES

Following completion of the exterior surfaces of manholes and vaults, including necessary repairs and piping penetrations into the structure, apply the specified material to prepared concrete surfaces in accordance with the manufacturer's recommendations. The surfaces to be coated shall be fully cured and free of laitance and contamination. The material shall be applied to all exterior surfaces below a point 12-inch above the water table or indications of seepage or moisture as directed by the Engineer. Apply two 15 mil coats, curing between coats, prior to backfill and/or immersion in accordance with the manufacturer's recommendations.

3.12 THRUST AND ANCHOR BLOCKS

Concrete thrust and anchor blocks shall be placed against wetted, undisturbed soil in accordance with the Standard Drawings and as directed by the District. The concrete shall be placed so that fittings and valves will be accessible for repairs or replacement. Prior to filling the pipeline with water, the concrete for thrust and anchor blocks shall cure for the following number of days:

Thrust Blocks	3 days minimum
Anchor Blocks	7 days minimum

A. Pipe Thrust:

The following table lists the minimum bearing area (in square feet) for the noted fitting for each pipe size. The area shown is for each 100psi of test pressure, assuming a soil bearing pressure of 2,000psi. (For instance, if the test pressure is required to be 250psi, multiply the value in the table by 2.5.)

Pipe Size	Tees and Dead Ends	90° Bend	45° Bend	22½° Bend	11¼° Bend
6-inch	3.7	5.3	2.9	1.5	0.7
8-inch	6.4	9.1	4.9	2.5	1.3
10-inch	9.7	13.7	7.4	3.8	1.9
12-inch	13.7	19.4	10.5	5.3	2.7
14-inch	18.4	26.0	14.1	7.2	3.6
16-inch	23.8	33.6	18.2	9.3	4.7
18-inch	24.9	42.2	22.9	11.7	5.9
20-inch	36.6	51.8	28.0	14.3	7.2
24-inch	52.3	73.9	40.0	20.4	10.2
30-inch	80.4	113.7	61.6	31.4	15.8

B. Thrust Block Placement and Sizing:

Thrust blocks shall be located at all unrestrained pipe fittings and bear against firm, undisturbed soil. The thrust blocks shall be centered on the fitting so that the bearing area is exactly opposite the resultant direction of the thrust, refer to the Standard Drawings. Care shall be taken to prevent the placed thrust block concrete from eliminating maintenance access to the valve operators. All thrust block excavation, location, shape, and size shall be verified by the District Engineer prior to pouring concrete. The size shall be as indicated in Paragraph A above.

C. Anchor Block Placement and Sizing:

For all vertical bends in pipelines (downward bends) that do not have restrained joints, the fittings shall be retained in place by means of an anchor block. The block shall be sized to withstand the thrust exerted for the particular deflection angle at the required test pressure plus 10%. (Do not rely on the restraining benefit from the soil). The District Engineer shall verify the size chosen and the reinforcing steel required.

3.13 VALVE SUPPORT BLOCKS

Valve support blocks shall be installed as described below and in accordance with the Standard Drawings:

A. Support blocks below valves shall be cut into the side of the trench a minimum of 12-inch.

B. Support blocks shall extend up to the height of adjoining pipe and shall have a minimum depth below the valve of 12-inch.

C. Support blocks shall be installed so that the valves will be accessible for repairs.

END OF SECTION

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SECTION 09900

PAINTING AND COATING

PART 1 GENERAL

1.01 DESCRIPTION

This section described the requirements for the preparation of surfaces and subsequent application of protective coatings. The Contractor shall furnish all labor, materials and equipment required for satisfactory completion of all items contained herein. The Contractor shall furnish all necessary safety equipment and protective clothing, as well as be responsible for proper instruction and supervision of their use.

1.02 SUBMITTALS

Contractor shall furnish submittals in accordance with the requirements of Section 1 – General Conditions. The following submittals are required:

A. Submit a chart of the manufacturer's available colors for color selection well in advance of painting operation.

B. Submit manufacturer's data sheets showing the following information:

1. Recommended surface preparation.

2. Minimum and maximum recommended dry-film thicknesses per coat for prime, intermediate, and finish coats.

3. Percent solids by volume.

4. Recommended thinners.

5. Statement verifying that the selected prime coat is recommended by the manufacturer for use with the selected intermediate and finish coats.

6. Application instructions including recommended application, equipment, humidity, and temperature limitations.

7. Curing requirements and instructions.

C. Submit certification that all coatings conform to applicable local Air Quality Management District rules and regulations for products and application.

PART 2 MATERIALS

2.01 GENERAL

A. All materials shall be those of current manufacture and shall meet all applicable regulations for the application and intended service. All coats of any particular coating system shall be of the same manufacturer and shall be approved by the manufacturer for the intended

service. In the event that a product specified herein is no longer manufactured or does not meet current regulations, the Contractor shall provide a substitute, currently manufactured product of at least equal performance which meets all applicable regulations, subject to the District Engineer's approval, at no additional cost.

B. All materials shall be delivered to the Project Site in their original, unopened containers bearing the manufacturer's name, brand, and batch number. Standard products of manufacturers other than those specified will be accepted when it is proved to the satisfaction of the District Engineer they are equal in composition, durability, usefulness and convenience for the purpose intended.

Ameron Corrosion Control Division, Brea, CA
ICI Devoe Coatings, Strongsville, OH
Tnemec Company, Inc., Kansas City, MO, 64141

C. All surfaces to be coated or painted shall be in the proper condition to receive the material specified before any coating or painting is done. No more sandblasting or surface preparation than can be coated or painted in a normal working day will be permitted. All sharp edges, burrs, and weld spatter shall be removed. All concrete and masonry surfaces shall cure 30 days prior to coating or painting.

D. Surface preparation, prime coatings, and finish coats for the various systems are specified herein. Unless otherwise noted, all intermediate and finish coats shall be of contrasting colors. It is the intent that the coating alternates specified herein serve as a general guide for the type of coating desired.

2.02 VALVES

A. Exterior Coating: Coat ferrous valves located above ground, in vaults or in structures the same as the adjacent piping. If the adjacent piping is not coated, then coat valves per this Specification section unless otherwise noted. Apply the specified prime coat at the place of manufacture. Apply intermediate and finish coats in the field. Finish coat shall match the color of the adjacent piping. Coat handwheels and floor stands the same as the valves. Coat the exterior of buried metal valves at the place of manufacture per this specification.

B. Exterior Coating (Above ground):
Shop prime coat: Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Touch-up (Field): Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 3.0 to 5.0 mils DFT.
Finish Coat: Tnemec Series 1075 Endura-Shield II @ 2.0 to 3.0 mils DFT.

C. Exterior Coating (Buried):
Shop prime coat: Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Shop Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.
Shop Finish Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.

D. Interior Lining: Valves 4-inches and larger shall be coated on their interior metal surfaces excluding seating areas and bronze and stainless-steel pieces. Sandblast surfaces in accordance with SSPC-SP-10 (near white blast cleaning). 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:

1. Apply powdered thermosetting epoxy per the manufacturer's application recommendations to a thickness of 10 to 12 mils.

2. Apply two (2) coats of polyamide epoxy to a dry-film thickness of 10 to 12 mils total. Follow the manufacturer's application recommendations including minimum and maximum drying time between the required coats.

3. All epoxy lining shall be applied at the factory by the manufacturer of the valve, and shall meet current Volatile Organic Compound (VOC) content regulations. Epoxy lining for potable water valves shall also be listed by National Sanitation Foundation (NSF) for contact with potable water.

4. Test the valve interior linings at the factory with a low-voltage holiday detector. The lining shall be holiday free.

2.03 METAL, INTERIOR AND EXTERIOR, NORMAL EXPOSURE

A. General: The Contractor shall paint all exposed steelwork, non-galvanized handrails, exposed pipework, fittings, all mechanical equipment, pumps, motors, doors, door frames and window sash with this coating system. All metalwork previously given a shop prime coat approved by the District Engineer shall be touched up as required in the field with an approved coating.

B. Surface Preparation: All exterior metal surfaces which are to be painted shall be commercial blast cleaned per Specification SP-6 (commercial blast cleaning) except as otherwise specified, in locations where sandblasting would damage previously coated surfaces and installed equipment, and in locations where dry sandblasting is prohibited. The above locations in which SP-6 commercial sandblasting is not possible shall be given a SP-3 power tool cleaning. This sandblasting shall be done not more than 8 hours ahead of the painting, subject to humidity and weather conditions between the time of sandblasting and painting operations. If any rusting or discoloration of sandblasted surfaces occurs before painting, such rusting or discoloration shall be removed by additional sandblasting. Sandblasted surfaces shall not be left overnight before painting.

C. Coating:

1. Prime coat or spot prime coat: Tnemec Series 18 Enviro-Prime applied at 2.0 to 3.5 mils DFT.

2. Intermediate Coat: Tnemec Series 1028 Tufcryl Gloss Acrylic applied at 2.0 to 2.5 mils DFT.

3. Finish Coat: Tnemec Series 1028 Tufcryl Gloss Acrylic applied at 2.0 to 2.5 mils DFT.

4. Total dry-film thickness of the complete system shall be 6.0 to 8.5 mils DFT.

2.04 METAL, SUBMERGED OR INTERMITTENTLY SUBMERGED

A. General: All submerged metalwork, gates, equipment, valves, exposed pipework and all other metalwork within areas which will be submerged, except as noted hereinafter, shall be painted with this coating system.

B. Surface Preparation: All metal surfaces shall be field sandblasted according to SSPC-SP-10 (near white blast cleaning).

C. Coating:

1. Coating (Potable water):
   Prime coat: Tnemec Series V140 or V140F Pota-Pox Plus applied at 4.0 to 6.0 mils DFT.
   Intermediate coat: Tnemec Series V140 or V140F Pota-Pox Plus applied at 4 to 6 mils DFT.
   Finish coat: Tnemec Series V140 or V140F Pota-Pox Plus applied at 4 to 6 mils DFT.
   Total dry-film thickness of the complete system shall be 12.0 to 18.0 mils.

2. Coating (Non-potable):
   Primer: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT.
   Intermediate coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT.
   Finish coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT.
   Total dry-film thickness of the complete system shall be a 12.0 to 18.0 mils DFT.

NOTE: Tnemec Series V140 or V140F can also be used for Non-Potable system.

2.05 METAL, SEVERE EXPOSURE TO MOISTURE OR CHEMICAL FUMES

A. Surface Preparation: All metal surfaces shall be field sandblasted according to SSPC-SP-10 (near white blast cleaning).

B. Coating:

1. Exterior Coating:
   Shop prime coat: Tnemec Series 90-97 Tneme-Zinc applied at 2.5 to 3.5 mils DFT.
   Touch-up (Field): Tnemec Series 90-97 Tneme-Zinc applied at 2.5 to 3.5 mils DFT.
   Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 3.0 to 5.0 mils DFT.
   Finish Coat: Tnemec Series 1075 Endura-Shield II @ 2.0 to 3.0 mils DFT.

2. Interior Coating:
   Shop prime coat: Tnemec Series 90-97 Tneme-Zinc applied at 2.5 to 3.5 mils DFT.
   Touch-up (Field): Tnemec Series 90-97 Tneme-Zinc applied at 2.5 to 3.5 mils DFT.
   Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.

3. Finish Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.

2.06 METAL, HIGH-TEMPERATURE EXPOSURE

A. General: Engine mufflers, exhaust systems and other metal surfaces subjected to high temperatures shall be coated with this system.

B. Surface Preparation: Surface shall be field sandblasted in accordance with SSPC-SP-10 (near white blast cleaning).

C. Coating (Tnemec Alternate): One coat of Tnemec Series 90-96 Tneme-Zinc to a total dry-film thickness of 2.5 to 3.5 mils.

D. Coating (ICI Devoe Coatings Alternate): One coat of Catha-Coat 304V Zinc to a dry-film thickness of 2 to 4 mils.

2.07 METAL, GALVANIZED, ALUMINUM, COPPER, OR BRASS

A. Surface Preparation: Surfaces shall be solvent cleaned in accordance with SSPC-SP-1 (solvent cleaning) and SSPC-SP- (Brush off Blast cleaning). Next, apply recommended coating or paint for the particular surface to be coated.

B. Coating Interior Exposed:
Prime coat: Primer: Tnemec Series V69 Epoxoline II applied at 2 to 3 mils DFT.
Finish coat: Tnemec Series V69 Epoxoline II applied at 2 to 3 mils DFT.
Total try-film thickness of the complete system shall be 4.0 to 6.0 mils.

C. Coating Exterior Exposed:
Prime coat: Primer: Tnemec Series V69 Epoxoline II applied at 2 to 3 mils DFT.
Finish coat: Tnemec Series 1075 Endura-Shield II applied at 2 to 3 mils DFT.
Total try-film thickness of the complete system shall be 4.0 to 6.0 mils.

D. Coating (Sinclair Alternate) 7113 Wash Primer applied at ½ mil dry-film thickness.

2.08 METAL, BURIED

A. General: The Contractor shall coat all buried metal which includes valves, bolts, nuts, structural steel and fittings. It does not include steel storage reservoirs.

B. All buried flanges, fittings, and nuts and bolts shall be wrapped per AWWA C-217 and wrapped with polyethylene encasement per AWWA C – 105. Nuts and Bolts shall be individually wax taped per FPUD Standard Drawing CP-9 notes. Buried Valves shall be wrapped with polyethylene encasement per AWWA C-105.

C. Surface Preparation: Sandblast to SSPC-SP-6 (commercial blast cleaning)

D. Coating (Tnemec Alternate): Prime Coat: Tnemec Series 46H-413 Hi-Build Tneme-Tar applied at 8.0 to 10.0 mils DFT. Finish Coat: Tnemec Series 46H-413 Hi-Build Tneme-Tar applied at 8.0 to 10.0 mils DFT. Total dry-film thickness shall be 16.0 to 20 mils.

2.09 MASONRY, EXTERIOR, NORMAL EXPOSURE

A. General: All exterior masonry surfaces subject to normal exposure shall be painted with this system.

B. Surface Preparation: Surfaces shall be free of dirt, dust, grease, or other deleterious matter before coating. All cracks and voids shall be filled with a suitable caulking material compatible with the specified coating.

C. Coating (Tnemec Alternate): Prime Coat: Tnemec Series 180 W.B. Tneme-Crete, 4.0 to 6.0 mils DFT. Finish Coat: Tnemec Series 180 W.B. Tneme-Crete, 4.0 to 6.0 mils DFT. Total dry-film thickness shall be 8 to 12 mils.

D. Coating (ICI Devoe Coatings Alternate): Two (2) coats of Devflex 4020 Acrylic, 2.5 to 3.5 mils dry-film thickness, each. Total dry-film thickness shall be 6 mils minimum.

2.10 MASONRY, INTERIOR

A. Surface Preparation: For concrete surfaces, surfaces to be coated must be sandblasted according to SSPC-SP-7 (brush-off blast cleaning) with 60-80 mesh sand and air pressure 50-60 psi to remove all cement glaze and residue of form release agents and provide a uniform surface profile of approximately 1 mil. Fill voids, holes, and pits with Tnemec Series 104 H.S. Epoxy sprayed and backrolled to create a void-free surface or (Devoe Coating) Tru-Glaze 4015 Epoxy applied as required. Vacuum clean or air blast surface prior to coating. Surfaces shall cure a minimum of 28 days prior to coating.

B. Interior Coating (Tnemec Alternate): CMU Coating System: Block Filler / Prime Coat: Tnemec Series 130 Envirofill applied at 60 to 115 sq ft/gal to create a void-free surface. Intermediate coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT. Finish coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT. Total dry-film thickness of the complete system shall be a minimum of 8-12 mils not including block filler.

C. Concrete System: Filler Coat: Tnemec Series 218 Mortar-Clad as required to fill bugholes and cracks in concrete. Intermediate coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT. Finish coat: Tnemec Series V69 Epoxoline II applied at 4 to 6 mils DFT. Total dry-film thickness of the complete system shall be a minimum of 8-12 mils not including filler.

2.11 MASONRY, SEVERE EXPOSURE

A. General: This system is for interior and exterior masonry surfaces subject to severe exposure or chemical attack.

B. Surface Preparation: Surfaces to be coated must be sandblasted according to SSPC-SP-7 (brush-off blast cleaning) with 60-80 mesh sand and air pressure of 50-60 psi to remove all cement glaze and residue of form release agents and provide a uniform surface profile of approximately 1 mil. Fill voids, holes, and pits with Tnemec Series 104 H.S. Epoxy sprayed applied as required. Vacuum clean or air blast surface prior to coating. Surfaces shall cure a minimum of 28 days prior to coating.

C. Coating (Tnemec Alternate): CMU Coating System: Block Filler / Prime Coat: Tnemec Series 130 Envirofill applied at 60 to 115 sq ft/gal to create a void-free surface. Intermediate coat: Tnemec Series 104 H.S. Epoxy applied at 6 to 8 mils DFT. Finish coat: Tnemec Series 104 H.S. Epoxy applied at 6 to 8 mils DFT. Total dry-film thickness of the complete system shall be a minimum of 12-16 mils not including block filler.

D. Concrete System: Filler Coat: Tnemec Series 218 Mortar-Clad as required to fill bug holes and cracks in concrete. Intermediate coat: Tnemec Series 104 H.S. Epoxy applied at 6 to 8 mils DFT. Finish coat: Tnemec Series 104 H.S. Epoxy applied at 6 to 8 mils DFT. Total dry-film thickness of the complete system shall be a minimum of 12-16 mils not including filler.

2.12 CONCRETE FLOORS

A. General: Includes specified concrete floors subject to moisture and pedestrian traffic.

B. Surface Preparation: Surfaces to be coated must be sandblasted in accordance with SSPC-SP-7 (brush-off blast cleaning) with 60-80 mesh sand and air pressure of 50-60 psi to remove all cement glaze and residue or other agents and provide a uniform surface profile of approximately 1 mil.

C. Coating (Tnemec Alternate): Floor Coating: Prime Coat: Series 201 Epoxoprime applied at 4.0 to 6.0 mils DFT. Intermediate Coat: Tnemec Series 280 Tneme-Glaze at 6 to 8 mils DFT. Finish Coat: Tnemec Series 280 Tneme-Glaze at 6 to 8 mils DFT. Total dry-film thickness shall be 16.0 to 22 mils.

2.13 WOODWORK - INTERIOR AND EXTERIOR

A. General: The Contractor shall paint all interior and exterior wood including, but not limited to, doors, frames, panels, sash and trim.

B. Surface Preparation: Surfaces shall be clean, dry, and free of all contaminants. All surfaces shall be sanded smooth. Knots, pitch pockets, and other bleed points shall be sealed with a shellac-based sealer after areas are scraped clean and sanded. Holes and imperfections shall be spot-primed, filled with plastic wood filler, and sanded smooth. All surfaces shall be dusted clean prior to coating. Moisture content shall be tested using an electronic moisture meter and shall not exceed 15%.

C. Coating (Tnemec Alternate): Interior & Exterior Coating: Prime coat: Tnemec Series 151-1051 Elastic-grip FC applied at 1 mil DFT. Intermediate Coat: Tnemec Series 1029 Tufcryl Semi-Gloss applied at 1.5 to 2.0 mils DFT. Finish Coat: Tnemec Series 1029 Tufcryl Semi-Gloss applied at 1.5 to 2.0 mils DFT. Total dry-film thickness of the complete system shall be 4.0 to 5.0 mils DFT.

2.14 PLASTER, DRYWALLS - INTERIOR

A. Surface Preparation: Surfaces shall be free of dirt, dust, grease, or other deleterious matter before coating. All cracks and voids shall be filled with a suitable spackling material compatible with the specified coating.

B. Coating (Tnemec Alternate): Coating: Prime coat: Tnemec Series 51-792 Sealer applied at 1 to 2 mils dry-film thickness. Finish coats(2): Tnemec Series 6 Tneme-Cryl applied at 2 to 3 mils dry-film thickness, each. Total dry-film thickness shall be 5.0 to 8 mils.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall arrange with the District Engineer so that all surface preparation may be inspected and approved prior to the application of any coatings.

B. The Contractor is hereby notified that the District Engineer will inspect the Work prior to the expiration of the warranty period and all defects in workmanship and material shall be repaired by the Contractor, at his own expense.

3.02 WORKMANSHIP

A. It is the intent of the Specifications that finishes shall be provided which meet standards for best grades of painting. Drop cloths shall be placed where required to protect floors, surfaces and equipment from spatter and dropping, not to receive paint or coatings.

B. The Contractor shall take all necessary precautions to protect all adjacent Work and all surrounding property and improvements from any damage whatsoever as a result of the painting and coating operation.

C. Only good, clean brushes and equipment shall be used and all brushes, buckets, and spraying equipment shall be cleaned immediately at the end of each painting period.

D. Each coat of paint shall be of the consistency as supplied by the manufacturer, or thinned, if necessary, and applied in accordance with manufacturer's instructions. Each coat shall be well brushed, rolled or sprayed to obtain a uniform and evenly applied finish. Work shall be free from "runs", "bridges", "shiners", or other imperfections due to faulty intervals. Particular care shall be taken to obtain a uniform unbroken coating over all bolts, threads, nuts, welds, edges and corners. Paint shall not be applied in extreme heat, in dust or smoke laden air, or in damp or humid weather, unless written permission of the District Engineer is obtained.

E. If paint is applied by spray, the air pressure used shall be within the ranges recommended by both the paint and spray equipment manufacturers. Spray painting shall be conducted under controlled conditions and the Contractor shall be fully responsible for any damage occurring from spray painting.

F. Care shall be exercised not to damage adjacent Work during sandblasting operations. Stainless steel need not be sandblasted. Blasted surfaces shall not be left overnight before coating. All dust shall be removed from the surface following sandblasting.

3.03 APPLICATION PROCEDURES

A. Surfaces to be Coated: All surfaces of materials furnished and constructed are to be painted or coated per the Specifications except as indicated below.

B. Surfaces Not To Be Coated: The following surfaces shall not be coated unless otherwise noted on the Plans and shall be fully protected when adjacent areas are painted:

Aluminum grating	Grease fittings	Nameplates on machinery
Aluminum surfaces	Hardware	Pipe interior*
Bearings	Lighting fixtures	Shafts
Brass and copper tubing, submerged*	Machined surfaces	Stainless steel
Buried pipe	Metal letters	Switch plates
Couplings	Mortar-coated pipe & fittings	

* unless specifically required on the Plans or elsewhere in the Specifications

C. Protection of Surfaces Not To Be Coated: Surfaces not intended to be painted shall be removed, masked, or otherwise protected. Drop cloths shall be provided to prevent paint materials from falling on or marring adjacent surfaces. Working parts of mechanical and

electrical equipment shall be protected from damage during surface preparation and painting process. Openings in motors shall be safely masked to prevent paint and other materials from entering the motors. All masking materials shall be completely removed and surfaces cleaned at completion of painting operations.

D. Weather Conditions:

1. Paint shall not be applied in the rain, wind, snow, mist, and fog or when steel or metal surface temperatures are less than 5°F above the dew point.
2. Paint shall not be applied when the relative humidity is above 80%, the air temperature is above 90°F, or the temperature of metal to be painted is above 125°F.

3. Alkyd, chlorinated rubber, inorganic zinc, silicone aluminum, or silicone acrylic paints shall not be applied if air or surface temperature is below 50°F or expected to be below 50°F within 24 hours.

4. Epoxy, coal tar epoxy, acrylic latex, and polyurethane paints shall not be applied on an exterior or interior surface if air or surface temperature is below 50°F or expected to drop below 50°F within 24 hours.

3.04 SURFACE PREPARATION

A. General: Sandblast or prepare only as much surface area as can be coated in one day. All sharp edges, burrs, and weld spatter shall be removed. Epoxy-coated pipe that has been factory coated shall not be sandblasted.

B. SSPC Specifications:

1. Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning" or similar words are used in the Specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structures Paint Council, Surfaces Preparation Specifications, ANSI A159.1) Specifications listed below:

SP-1	Solvent Cleaning	SP-6	Commercial Blast Cleaning
SP-2	Hand Tool Cleaning	SP-7	Brush-Off Blast Cleaning
SP-3	Power Tool Cleaning	SP-8	Pickling
SP-5	White Metal Blast Cleaning	SP-10	Near White Blast Cleaning

2. Oil and grease shall be removed from aluminum and copper surfaces in accordance with SSPC SP-1 using clean cloths and cleaning solvents.

3. Weld spatter and weld slag shall be removed from metal surfaces. Rough welds, beads, peaked corners, and sharp edges including erection lugs shall be ground smoothly in accordance with SSPC SP-2 and SSPC SP-3.

4. Welds shall be neutralized with a chemical solvent that is compatible with the specified coating materials using clean cloths and chemical solvent.

C. Abrasive Blast Cleaning:

1. Dry abrasive blast cleaning shall be used for metal surfaces. Do not recycle or reuse contaminated blast particles.

2. Dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting. Apply the specified primer or touch-up coating within the period of an 8-hour working day. Do not apply coating over damp or moist surfaces. Reclean prior to application of primer or touch-up coating any blast cleaned surface not coated within said 8-hour period.

3. Prevent damage to adjacent coatings during blast cleaning. Schedule blast cleaning and coating such that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

3.05 PROCEDURES FOR THE APPLICATION OF COATINGS

A. The recommendations of the coating manufacturer shall be followed, including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Coating materials shall be kept at a uniform consistency during application. Each coating shall be applied evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. A different shade or tint shall be used on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Only thinners recommended by the coating manufacturer shall be used. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material.

D. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces prior to the application of the primer and finish coat. The brush coat shall be done prior to and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

E. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Reclean surfaces by blast cleaning that have surface colored or become moist prior to coating application.

1. Paint Mixing: Multiple-component coatings shall be prepared using all the contents of each component container as packaged by the paint manufacturer. Partial batches shall not be used. Multiple-component coatings that have been mixed beyond their pot life shall not be used. Small quantity kits for touch-up painting and for painting other small areas shall be provided. Only the components specified and furnished by the paint manufacturer shall be mixed. For reasons of color or otherwise, additional components shall not be intermixed, even within the same generic type of coating.

2. Field Touch Up of Shop-Applied Prime Coats: Organic Zinc Primer: Surfaces that are shop primed with zinc rich primers shall receive a field touch up of organic zinc primer to cover all scratches or abraded areas. Organic zinc coating system shall have a minimum volume solids of 62% and a minimum zinc dust content of 83% by weight in the dried film. Coating shall be of urethane type and shall be manufactured by the prime coat and finish coat manufacturer.

3. Other Primers: Surfaces that are shop primed with other than organic zinc primer shall receive a field touch up of the same primer used in the original prime coat.

3.06 DRY-FILM THICKNESS TESTING AND REPAIR

A. Special Instructions to the Contractor: The Contractor shall furnish to the District at no charge for use during execution of the Work, necessary dry-film thickness gauge and electrical flaw detection equipment. The Contractor shall perform the holiday (pinholes) inspection in the presence of the District Engineer, and the Contractor shall monitor wet film measurements throughout the application of each coat of coating.

B. Coating Thickness Testing: Coating thickness specified for steel surfaces shall be measured with a magnetic-type dry-film thickness gauge. Dry-film thickness gauge shall be provided as manufactured by Mikrotest or Elcometer. Each coat shall be checked for the correct dry-film thickness. Measurement shall not be made until a minimum of eight hours after application of the coating. Non-magnetic surfaces shall be checked for coating thickness by micrometer measurement of cut and removed coupons. Contractor shall repair coating at all locations where coupons are removed.

C. Holiday Testing: The finish coat (except zinc primer and galvanizing) shall be tested by the Contractor for holidays and discontinuities with an electrical holiday detector of the low-voltage, wet-sponge type. All testing shall be done in the presence of the District Engineer and conducted per manufacturer's written recommendations. All Holiday testing shall be in conformance with NACE RP 0188-88 / RP 0490.

D. Repair: If the item has an improper finish, color, insufficient film thickness, or holidays, the surface shall be cleaned and top-coated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the Specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.07 CLEANUP

Upon completion of all painting and coating Work, the Contractor shall remove all surplus materials and rubbish. The Contractor shall repair all damage and shall leave the premises in a clean and orderly condition.

END OF SECTION

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SECTION 13110

CORROSION CONTROL FOR BURIED PIPING

PART 1 GENERAL

1.01 SCOPE

This specification section addresses the materials, installation and testing for basic corrosion control and monitoring facilities required on most buried metallic piping. The corrosion control facilities include in this specification section are: corrosion test stations, joint bonding, insulating flange kits, casing test stations, wire and cable, alumino-thermic welds, and simple sacrificial anode installations. Large piping projects or projects requiring large sacrificial anode or impressed current cathodic protection systems will require more detailed drawings and specifications.

1.02 REFERENCE 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 B16.21.92	Nonmetallic Flat Gaskets for Pipe Flanges
ASTM C94-81	Ready –Mix Concrete
ASTM D1248-89	Polyethylene Plastics Molding and Extrusion Materials
ASTM D2220-80	Polyvinylchloride Insulation for Wire and Cable, 75º Operation
AWWA C217-90	Cold-Applied Petrolatum Tape and Petroleum Wax Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Buried Steel Water Pipelines
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-1-1983	Industrial Laminate Thermosetting Products
MIL-C-18480B	Coating Compound, Bituminous, Solvent, Coal Tar Base
UL 83-80	Thermoplastic-Insulated Wires
UL 486-76	Wire Connectors and Soldering Lugs for Use with Copper Conductors

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD	Standard Drawings CP-1 through CP-17
Project Specific	Cathodic Protection Specifications and Drawings
FPUD	Standard Drawings
FPUD	Standard Specifications
Section 02223	Trenching, Backfilling, and Compacting
Section 03300	Cast-in-Place Concrete
Section 15056	Ductile Iron Pipe and Fittings
Section 15076	CML&C Steel Pipe

1.04 SUBMITTALS

A. Submit shop drawings in accordance with FPUD Standard Specifications.

B. Submit five (5) copies of manufacturer's catalog data and descriptive literature for all material items listed below and included in the project. Show dimensions and materials of construction by specification reference and grade where applicable.

1.05 DUCTILE IRON PIPE ENCASEMENT

Unless otherwise specified all ductile iron pipe shall be fully encased in 8 mil (0.008 inches) polyethylene sheet material in accordance with AWWA C105 Method A and STD SPEC 15056. The plastic encasement shall be installed without pinholes or tears and shall be fully protected from damage during backfilling. All pipe sections shall be fully inspected by the District Engineer before the pipe is backfilled.

1.06 BURIED VALVES, FLANGES AND COUPLINGS

A. Wax Tape Coating

1. All buried, non-mortar coated piping surfaces such as valves, couplings, adapters, flanges or bare pipe shall be wrapped with petrolatum wax tape coating in accordance with AWWA C-217 and this specification

2. The fittings and bolts surfaces shall be primed with a blend of petrolatum, plasticizer, insert fillers, and corrosion inhibitor having a paste-like consistency.

3. Filling covering material shall be a synthetic felt tape, saturated with a blend of petrolatum plasticizers, and corrosion inhibitors that is easily formable over irregular surfaces.

4. The primed and wax-tape wrapped fitting shall be wrapped with plastic tape covering consisting of 1.5 mil, polyvinylidene chloride or metallocene resin material. The tape shall have high dielectric strength, be stretchable and be able to conform well to irregular shapes.

PART 2 MATERIALS NOT USED

PART 3 EXECUTION NOT USED

PART 4 SYSTEM TESTING

4.01 TEST LEADS AND BOND WIRES NOT USED

4.02 ANODE INSTALLATIONS NOT USED

4.03 WIRE TRENCHING NOT USED

4.04 INSULATOR TESTING NOT USED.

4.05 PIPELINE CONTINUITY NOT USED

4.06 TEST STATIONS NOT USED

4.07 WAX TAPE COATING AND POLYETHYLENE WRAP

A. Responsibility: The District Engineer shall inspect all completed wax tape and polyethylene wrapping for compliance with these specifications prior to backfilling.

B. Test Method: Inspection shall be visual.

C. Wax Tape Acceptance: Wax tape applications shall be accepted if: the application conforms with this specification; there are no voids or gaps under the wax tape; stud-ends, nuts, couplings rods and all irregular surfaces are individually wrapped such that there is complete coverage with the petrolatum material; the outer wrap is complete and tightly adhering to the wax tape; and the application is done in a good workman-like manner.

D. Supplementary Lining Acceptance: Internal supplementary linings must cover the specified length of pipe and must be well bonded to the substrate and free of voids or damage.

4.08 CASING ISOLATION NOT USED

4.09 DEFICIENCIES NOT USED

- - - END OF SECTION - -

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SECTION 15000

GENERAL PIPING SYSTEM AND APPURTENANCES

PART 1 GENERAL

1.01 DESCRIPTION

This section describes the requirements and procedures for piping systems (pressure pipe and gravity sewer pipe) and appurtenances that apply to a number of other complimentary Specification Sections. The items are listed in this section to avoid repetition in sections elsewhere. This section includes, but is not limited to, temporary pipelines, wet taps/line stops, flexible pipe couplings, grooved and shouldered end couplings, joint restraint systems, field touch up, bolts, nuts, polyethylene wrap, warning/identification tape, tracer wire, gate well and extension stems, meter boxes, abandonment and removal of existing facilities, salvage, and disposal.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

AWWA C105	-	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C111	-	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C200	-	Steel Water Pipe – 6 In. (150mm) and Larger
AWWA C203	-	Coal-Tar Protective Coatings and Linings for Steel Water Pipelines – Enamel and Tape – Hot-Applied
AWWA C213	-	Fusion-Bonded Epoxy Coating for Interior and Exterior of Steel Water Pipelines
AWWA C606	-	Grooved and Shouldered Joints
AWWA C900	-	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100mm Through 300mm), for Water Transmission and Distribution
AWWA M11	-	Steel Pipe - A Guide for Design and Installation
AWWA	-	Guidelines for Distribution of Non-Potable Water
ASTM A 36/A 36M	-	Standard Specification for Carbon Structural Steel
ASTM A 47/A 47M	-	Standard Specification for Ferritic Malleable Iron Castings
ASTM A 53	-	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 108	-	Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality
ASTM A 183	-	Standard Specification for Carbon Steel Track Bolts and Nuts
ASTM A 283/A 283M	-	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars
ASTM A 307	-	Standard Specification for Carbon Steel Bolts and Studs
ASTM A 325/A 325M	-	Standard Specification for High-Strength Bolts for Structural Steel Joints
ASTM A 510/A 510M	-	Standard Specification for General Requirements for Wire Rods and Course Round Wire, Carbon Steel

ASTM A 512	-	Standard Specification for Cold-Drawn Buttweld Carbon Steel Mechanical Tubing
ASTM A 536	-	Standard Specification for Ductile Iron Castings
ASTM A 568/A 568M	-	Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality and Cold Rolled
ASTM D 2000	-	Standard Classification System for Rubber Products in Automotive Applications
ASTM F 593	-	Specifications for Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F 594	-	Specification for Stainless Steel Nuts
ANSI B1.1	-	Unified Inch Screw Threads
ANSI B1.2	-	Gages and Gauging for Unified Inch Screw Threads
NSF	-	National Sanitation Foundation
SSPWC	-	Standard Specifications for Public Works Construction ("Greenbook")

California Administrative Code, Title 22

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD Standard Drawings Typical

1.04 LINING CONTAMINATION PREVENTION

Volatile organic compounds present in the linings of items in contact with potable water or recycled water shall not exceed concentrations allowed by the latest requirements of the State Office of Drinking Water and Department of Health Services. Some products and materials may also require proof of NSF certification on the lining materials to be used.

1.05 TEMPORARY PIPELINES

Temporary pipelines, where shown on the Approved Plans or required by the District Engineer, provide temporary service to customers during construction.

1.06 PIPE TAPPING (WET TAP and LINE STOP)

All pipe tap (wet tap) connections to and line stops installed on existing pipelines, whether for mainline or service laterals, shall be performed by the Contractor as directed by the Engineer. The Contractor shall provide all materials and labor necessary to install taps or line stops including excavation, thrust blocks, backfill, compact, and repair pavement. The Contractor shall perform wet taps in general conformance with the wet tapping procedures provided in WAS standards.

The Contractor’s tapping, line stop and fitting manufacturer shall have at least ten years of demonstrated expertise in the field of hot tapping and line plugging asbestos cement pipe and concrete cylinder pipe. He shall also have similar experience with hot tap welding on concrete cylinder pipe, and similar experience with manufacturing pressure fittings for these procedures. The Contractor shall submit the qualifications of these subcontractors prior to the start of work. Line stop shop drawings including materials and procedures to be used for each specific site will be submitted also.

1.07 JOINT RESTRAINT SYSTEMS

Joint Restraint Systems may be used for PVC or ductile-iron pipe when shown on the Approved Plans or with prior approval of the District Engineer. Contractor shall submit shop drawings and catalog data for joint restraint systems in accordance with Section 01000, General Conditions.

1.08 CORROSION PROTECTION

Polyethylene encasement or wax tape per section 13110 shall be used for all ferrous metal materials not otherwise protectively coated.

A. Polyethylene wrap or sleeves shall be used for the protection of buried ductile-iron pipe, appurtenances, and valves.

B. Purple-colored polyethylene wrap or sleeves may also be installed around buried pipe for recycled water identification.

1.09 WARNING/IDENTIFICATION TAPE

Warning/identification tape shall be installed to identify location of underground utilities and to act as a warning against accidental excavation of buried utilities. Warning/identification tape shall be used on all underground water and recycled water mains, potable and recycled water irrigation systems, sewer mains, and all related appurtenances. Warning/identification tape shall also be used on cathodic protection wiring systems and tracer wire brought into and out of access ports.

1.10 TRACER WIRE

Tracer wire shall be installed on all buried PVC water and recycled water mains for the purpose of providing a continuous signal path used to determine pipe alignment after installation. Tracer wire is not required in installation of sewer mains.

1.11 GATE WELLS

Gate wells shall be used for buried valves 50mm (2”) and larger, unless otherwise indicated on the Standard Drawings. Gate well lids shall be used on all gate wells.

1.12 VALVE STEM EXTENSIONS

Valves 100mm (4”) and larger require valve stem extensions to be installed when the valve-operating nut is more than 1.5m (5') below grade or as required by the District Engineer. All valves 50mm (2”) and smaller requiring the installation of a gate well shall include a valve stem extension in accordance with the Standard Drawings.

1.13 METER BOXES

Meter boxes shall be used for water meters and other appurtenances as shown on the Standard Drawings, and per Approved Materials List.

1.14 CURB IDENTIFICATION MARK FOR SERVICES

The Contractor shall mark the location of all potable water, recycled water, and sewer laterals at the curb crossing by stamping the face of the curb in 50mm (2”) high letters as described below:

A. Potable water laterals shall be stamped with a letter “W”.

B. Recycled water laterals shall be stamped with the letters “RW”.

C. Sewer laterals be stamped with a letter “S”.

1.15 FIELD REPAIR OF DAMAGED COATINGS

All surfaces of metallic appurtenances in contact with potable water and not protected from corrosion by another system shall be shop-coated by the manufacturer. Appurtenances with damaged coatings shall be repaired or replaced as directed by the District Engineer. Touch-up of damaged surfaces, when allowed by the District Engineer, shall be performed in accordance with the manufacturer’s recommendations.

1.16 MAIN LINE STRAINER

Each pressure reducing station shall come equipped with a main line strainer placed immediately upstream of all valves and appurtenances as indicated.

PART 2 MATERIALS

2.01 TEMPORARY PIPELINES

Temporary piping layout, materials and appurtenances shall be as indicated on the approved submittal.

2.02 FLEXIBLE/TRANSITION PIPE COUPLINGS

Flexible or transition pipe couplings shall be in accordance with the Approved Materials List and as described below:

A. Couplings must conform to the latest edition of AWWA C219.

B. Steel Couplings shall have middle rings made of steel conforming to ASTM A 36/A 36M, A 53 (Type E or S), or A 512 having a minimum yield strength of 207 MPa (30,000 psi). Follower rings shall be ductile-iron per ASTM A 536, or steel per ASTM A 108, Grade 1018 or ASTM A 510, Grade 1018. Minimum middle ring length shall be 175 mm (7") for pipe sized 150 mm (6") through 600 mm (24").

C. Sleeve bolts shall be made of stainless steel per ASTM A193 or Type 304 and shall have a minimum yield strength of 276 MPa (40,000 psi), an ultimate yield strength of 414 MPa (60,000 psi), and shall conform to AWWA C111.

D. If the coupling requires a step in the sleeve, proper restraint must be provided to prevent migration along the pipeline.

E. Fusion bonded coating for interior and exterior per Section 09915.

F. Pressure rating: 250 psi

2.03 SHOULDERED COUPLINGS FOR DUCTILE IRON OR STEEL PIPE

Shouldered couplings shall be in accordance with the Approved Materials List and as described below:

A. Shoulder couplings shall be flexible type and provide for some expansion, contraction, and deflection. Rigid couplings will not be accepted.

B. Use square-cut shouldered ends per AWWA C606. Shouldered-end couplings shall be malleable iron per ASTM A 47, or ductile iron per ASTM A 536. Gaskets shall be per ASTM D 2000.

C. Bolts for exposed service shall conform to ASTM A 183, 69 MPa (10,000 psi) tensile strength.

D. Pressure rating: 800 psi

2.04 JOINT RESTRAINT SYSTEMS

A. Joint Restraint Systems shall be ductile-iron and shall consist of a split-ring restraint with machined (not cast) serrations on the inside diameter and connecting bolts, and shall be selected from the Approved Materials List. Serrations shall provide positive restraint, exact fit, 360º contact, and support of the pipe wall.

B. Joint restraints shall be provided where shown on the drawings. Restraints shall include 316 stainless steel bolts and fusion bonded epoxy coated ductile iron parts (ASTM A536).

C. Restraint Devices for PVC Pipe shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, 360° contact, and support of the pipe wall.

D. Restraint Devices shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel.

E. All Restraint Devices shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size.

2.05 RESTRAINED FLANGE ADAPTERS

A. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange drilling and facing compatible with ANSI/AWWA C110/A21.10 and ANSI/AWWA C115/A21.15.

B. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.

C. The flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6” gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

D. For PVC pipe, the flange adapter will have a pressure rating equal to the pipe.

E. For ductile iron and steel pipe, the flange adapter shall have a safety factor of 2:1 minimum.

F. For Steel Pipe greater than 12” provide 316 stainless steel retaining rods and weld restraining ears to pipe.

G. Nuts and bolts shall be Type 316 stainless steel

H. All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

I. The adapter shall have fusion bonded coating on both its interior and exterior per Section 09915.

2.06 BOLTS AND NUTS

If not identified in individual specification sections, bolts and nuts shall be as indicated below and shall be selected from the Approved Materials List.

A. Stainless steel bolts and nuts shall be used for the installation of pipelines 600mm (24") diameter and larger and for submerged flanges. Bolts and nuts shall be Type 304 stainless steel conforming to ASTM A193, Grade B8 and ASTM A194, Grade 8M with hex-heads for above ground applications and Type 316 stainless steel conforming to ASTM A193, Grade B8M for bolts, and Grade 8M for nuts for below ground applications.

B. All bolt heads and nuts shall be hexagonal, except where special shapes are required. Bolts shall be of such length that not less than 6.4mm (¼") or more than 12.7mm (½") shall project past the nut in tightened position.

2.07 POLYETHYLENE ENCASEMENT

Polyethylene encasement shall be as indicated below and shall be selected from the Approved Materials List. Polyethylene materials shall be kept out of direct sunlight

exposure.

A. Polyethylene wrap and sleeves shall be a minimum 0.203mm (0.008” or 8 mil) thick linear low-density polyethylene film in accordance with AWWA C105.

B. Polyethylene wrap and sleeves shall be clear for use with potable water and purple for use with recycled water.

C. Polyethylene encasement shall be secured with 50mm (2”) wide polyethylene or vinyl adhesive tape or with plastic tie straps.

2.08 WARNING / IDENTIFICATION TAPE

Warning/identification tape shall be as indicated below and in accordance with the Approved Materials List.

A. Tape shall be an inert, non-metallic plastic film formulated for prolonged underground use that will not degrade when exposed to alkalis, acids, and other destructive substances commonly found in soil. Laminate shall be strong enough that the layers cannot be separated by hand.

B. Tape shall be puncture-resistant and shall have an elongation of two times its original length before parting.

C. Tape shall be colored to identify the type of utility intended for identification. Printed message and tape color shall be as follows:

Printed Message	Tape Color
Caution: Waterline Buried Below	Blue
Caution: Recycled Waterline Buried Below	Purple
Caution: Sewerline Buried Below	Green
Caution: Cathodic Protection Cable Buried Below	Red
Caution: Electric Line Buried Below	Red

Ink used to print messages shall be permanently fixed to tape and shall be black in color with message printed continuously throughout.

D. Tape shall be minimum 0.102mm (0.004” or 4 mil) thick x 150mm (6") wide with a printed message on one side. Tape used with the installation of onsite potable and recycled water irrigation systems shall be a minimum of 75mm (3”) wide.

2.09 TRACER WIRE

Tracer wire shall be as indicated below and shall be selected from the Approved Materials List.

A. Tracer wire shall be #14 AWG solid copper UF type wire with cross-linked polyethylene insulation. The insulation shall be white or yellow in color.

B. Wire splices (at pipe tees, crosses, and laterals) shall be accomplished using a direct bury silicone-filled capsule tube with standard wire nut or silicone-filled wire

nut connectors of the appropriate size selected from the Approved Materials List.

2.10 GATE WELLS

A. Gate wells for valves 50mm (2") and larger, shall be 200mm (8") diameter Class SDR-35 PVC pipe selected from the Approved Materials List. Also see District Standard Drawing W-19

B. Gate well lids shall be circular ductile-iron selected from the Approved Materials List and shall include a skirt for a close fit inside the upper portion of the gate well. Lids shall be cast with the District's name and the word "WATER" for use on potable water systems.

1. Unless otherwise indicated on the Approved Plans or directed by the District Engineer, all gate well lids for valves 50mm (2") and larger shall be Type I (1) in accordance with Standard Drawing W-19 and selected from the Approved Materials List.

2. When indicated on the Approved Plans or when directed by the District Engineer, gate well lids located in roadways shall be Type II (2) in accordance with Standard Drawing W-19 consisting of a two-piece machined ductile-iron frame and lid selected from the Approved Materials List.

2.11 VALVE STEM EXTENSIONS

Stem extensions shall be complete with operating nut, location ring, and lower socket to fit valve-operating nuts. The configuration of the extension stem socket shall match that of the valve it operates.

A. Valve stem extensions for valves 50mm (2") or larger may be round or square hot-dipped galvanized steel tubing of solid design (or approved materials authorized by the District Engineer - no pinned couplings permitted) with guides in accordance with Standard Drawing W-19.

2.12 METER BOXES

Meter boxes shall be selected from the Approved Materials List.

A. Meter box sizes shall be as follows
(per District Standard Drawings W-1 and W-2):

Meter box uses	Meter box size
1" water services	20" x 26"
1.5" water services	36" x 48"
2" water services	36" x 60"

B. Meter box lids for use in recycled water system applications shall be purple.

2.13 MAIN LINE STRAINER

A main line strainer shall be capable of removing unwanted solid particles in pipeline flow and help prevent fouling, debris, and particle buildup in automatic control valves.

The large flow area design, with a flat stainless steel strainer mesh perpendicular to flow, is optimized for low pressure drop applications.

Maintenance should be simplified with a compact H-pattern, requiring only top cover removal. The strainer shall be serviceable without removing from the pipeline. The strainer may be installed in any position; however, installation with cover up is recommended.

The body shall be ductile iron with fusion bonded epoxy coating and lining. The strainer shall be constructed of Type 316 stainless steel. Cover seal shall be Buna N synthetic rubber. Cover fasteners shall be stainless steel.

Strainer mesh size shall be standard 10 mesh, 2000 micron with 078" openings.

Each strainer must come equipped with an equal sized, ¼ turn ball valve in place of the standard drain plug. Ball valves shall be placed on the side of the strainer facing the inside of the vault as indicated.

Strainer must have ANSI Class 150 flanged ends with an overall pressure rating of 250 psi.

Manufacturer must provide a flow chart showing pressure drop with corresponding flow rate along with Cv values for various strainer sizes.

Strainer shall be Cla-Val model #X43H or equal.

2.14 LINE STOPS

A. **Installed On Steel Pipe.** Line stops shall have full encirclement reinforcement pads or approved equal and shall be designed to fully replace the materials removed by the hot tapping operation per the formulas provided in ANSI/ASME B31.1 104.2.1, or approved equal.

The flanged outlet on the main line plugging fitting shall be of closure locking type and the flange completion plug shall be designed as adequate for the design pressure limit of the piping system, as per ANSI/ASME B31.1 104.5.3, or approved equal.

Permanent blind flange, flange gasket and stud bolts shall be of a size, rating, type, and facing to match the flange on the line plugging fitting.

PART 3 EXECUTION

3.01 TEMPORARY PIPELINES

A. All temporary piping, fittings, and service connections shall be furnished, installed, and maintained by the Contractor, and the Contractor shall make connections to a water source designated by the District Engineer.

B. All pipe, valves, fittings, hose, and connections furnished by the Contractor shall be of good quality, clean, and suitable for conveying potable water in the opinion of the District Engineer.

C. The temporary pipe shall be installed in such a manner that it will not present a hazard to traffic and will not interfere with access to homes and driveways along its route.

D. Valves shall be installed at 60m (200') intervals or as directed by the District Engineer. The use of pressure reducing valves (PRV) may be required as directed by the District Engineer.

E. The Contractor shall be responsible for disinfecting all pipe, connections, flushing, and assisting the District in taking water samples for bacteriological testing in accordance with Section 15041.

F. Following disinfection and acceptance of the temporary pipe as a potable water system, the Contractor shall maintain continuous service through the temporary piping to all consumers normally served both directly and indirectly by the pipeline.

G. Upon completion of the work, the Contractor shall remove the temporary piping and appurtenances and shall restore all surfaces to the satisfaction of the District Engineer.

H. If repairs to temporary piping are necessary, Contractor shall make such repairs in a timely manner as directed by the District Engineer. If progress in making repairs is inadequate, or in the event of emergency, the District Engineer may take immediate corrective measures, which may include the performance of repair work by District forces or another contractor. All costs for corrective measures shall be borne by the Contractor.

3.02 FLEXIBLE / TRANSITION PIPE COUPLINGS

Flexible/transition pipe couplings shall not be considered for use, unless approved by the District Engineer, and for special applications. If needed they shall be installed in accordance with the manufacturer's recommendations and as described below:

A. Use plain-end pipe with flexible couplings per AWWA C200. Provide joint harnesses per AWWA M11 for aboveground applications or where indicated on the Approved Plans.

B. Flexible/transition couplings may be used only where indicated on the drawings.

C. Clean oil, scale, rust, and dirt from the pipe ends and touch up the epoxy coating and allow time for curing before installing the coupling. Clean the gaskets before installing.

D. Follow the manufacturer's recommendations for installation and bolt torque using a properly calibrated torque wrench.

E. Lubricate the bolt threads with graphite prior to installation.

3.03 SHOULDERED COUPLINGS FOR DUCTILE-IRON OR STEEL PIPE

Shouldered couplings shall be installed in accordance with the manufacturer's recommendations and as described below:

A. Shouldered joint couplings shall be installed per AWWA C606 and the manufacturer's recommendations.

B. Clean loose scale, rust, oil, grease, and dirt from the pipe or fitting groove and touch up the epoxy coating as necessary, allowing time for curing before installing the coupling.

C. Clean the gasket before installation. Apply a lubricant selected from the Approved Materials List to the gasket exterior including lips, pipe ends, and housing interiors.

D. Fasten the coupling alternately and evenly until the coupling halves are seated. Follow the manufacturer's recommendations for bolt torque using a properly calibrated torque wrench.

3.04 JOINT RESTRAINT SYSTEMS (PVC and DI Pipe)

Joint Restraint Systems shall be installed as shown on the Approved Drawings, in accordance with the manufacturers' recommendations and as described below:

A. Split ring restraint shall be installed on the spigot end of pipe, connected to a back-up ring which seats behind the bell of the adjoining pipe or fitting or directly to the fitting. All joint restraint devices shall be installed in accordance with the manufacturers' instructions

B. Restraint devices may be installed prior to lowering pipe into the trench only with the approval of the District Engineer.

3.05 RESTRAINED FLANGE ADAPTERS

Restrained Flange Adapters shall be installed as shown on the Approved Drawings, in accordance with the manufacturers' recommendations and as described below:

A. Determine pipe material. If product requires spacers under the screws, make sure they are available prior to assembly.

B. Cut pipe to required length. Clean the end for approximately one foot with a wire brush if needed removing all excess paint and foreign material. Clean the opposing flange. Place the restraint ring on the clean pipe with the lip facing the plain end.

C. Lubricate and place the gasket on the clean pipe following the restraint ring.

D. Install the O-ring into the gasket ring groove if required by manufacturer.

E. Bring the pipe and flanges together within the maximum allowed deflection and maximum allowable gap to the flange face. Check manufacturer's requirements for these allowable dimensions.

F. Slide the gasket ring and restraining ring until contact is made with the opposing flange.

G. Insert and tighten all flange bolts. Torque in an alternating manner per the manufacturer's requirements and limits.

H. Tighten the actuating screws in an alternating manner until all wedges touch the pipe. Continue tightening the nuts in an alternating pattern until all the torque-limiting nuts have been twisted off.

I. If removal is necessary, utilize the hex head provided. For reinstallation, follow the steps above and torque the screws per the manufacturer's requirements.

3.06 BOLTS AND NUTS

A. All bolts and nuts shall be new and unused. Bolts shall not be reused once tightened. Used bolts and nuts shall be discarded and removed from the job site.

B. Bolts and nuts shall be cleaned, if needed, by wire brushing and shall be lubricated prior to assembly.

C. Tighten nuts uniformly and progressively in a "star" pattern.

D. Buried bolts and nuts shall receive a heavy coat of protective grease selected from the Approved Materials List prior to being wrapped with polyethylene.

E. All stainless steel bolts shall be coated with an anti-seize compound selected from the Approved Materials List.

3.7 WARNING / IDENTIFICATION TAPE

Warning/Identification Tape shall be installed as described below and in accordance with the Standard Drawings.

A. Tape shall be placed at the top of the pipe zone 300mm (12") above and centered over the utility intended for identification. Tape used with onsite potable and recycled water irrigation systems shall be installed at 150mm (6") above the pipe.

B. Tape shall be installed with the printed side up and run continuously along the entire length of the utility intended for identification. Tape shall be installed on the main piping and all appurtenant laterals, including blowoffs, air valve assemblies, fire hydrants, and services. Tape splices shall overlap a minimum of 600mm (24”) for continuous coverage.

C. Tape shall be installed prior to placement of the Trench Zone Backfill.

3.8 TRACER WIRE

Tracer wire shall be installed as described below and in accordance with the Standard Drawings.

A. Tracer wire shall be installed with all PVC water and recycled water mains.

B. Wire shall be placed on the top centerline of the pipeline and shall run continuously along the entire length of pipe prior to placement of trench backfill. Wire shall be mechanically and electrically continuous throughout the pipeline, including within pipe casings.

C. Tracer wire shall be secured to the pipe at 1.8m (6') intervals with plastic adhesive tape, duct tape or plastic tie straps. The wire may alternately be secured to the pipe by looping the tracer wire around itself such that tracer wire remains continuous atop the pipe during backfill operations.

D. Tracer wire access ports shall be installed in accordance with the Standard Drawings within the concrete splash pad of all fire hydrants installed as a part of the work. In addition, tracer wire may terminate within meter boxes, blow off boxes, CP test boxes or air valve enclosures as shown on the Approved Drawings or as directed by the District Engineer at intervals of not more than 305m (1,000'). Locations of all tracer wire access ports installed shall be noted on the field record drawings.

E. Wire shall extend into the access port and shall terminate with a coiled 600mm (24") length of wire. All tracer wire not attached to piping shall be installed, without splices, within a conduit at a minimum depth of 600mm (24”) in accordance with the Standard Drawings.

F. Splices shall be installed only when necessary and shall be made using wire connectors selected from the Approved Materials List.

G. The Contractor shall test tracer wire for electrical continuity in the presence of the District Engineer prior to the installation of any paving over atop pipelines or appurtenances. Testing shall be accomplished using a device capable of detecting improper connections or ground fault interruptions.

3.9 GATE WELLS

Gate wells shall be installed per the Approved Plans and as described below.

A. Gate wells shall be installed with lids flush with the final surface. No more than two 25mm (1") adjustment rings shall be used. Gate wells and adjustment rings shall be accurately cut perpendicular to the length of the piping used.

B. Gate wells shall be color-coded to identify the use of the valve installed.

1. The top exterior portion of the gate well lid and ring shall be coated in accordance with Section 9900, by Paint color noted as follows:

Color	Gate Well Lid and PVC Gate Well for:
Red	Normally Closed System Valves (NCV)
Yellow	Fire Hydrant Valves
Silver	All system In-Line, Tee, Blow-Off and AAV valves.
Purple	All Recycled Waterline System valves
Purple	All Outfall valves

3.10 VALVE STEM EXTENSIONS

A. Valves 50mm (2") and larger require valve stem extensions to be fabricated and installed in accordance with the Standard Drawings when the valve-operating nut is more than 1.5m (5') below grade. Stem extensions shall be of sufficient length to bring the operating nut to a point between 300mm (12") and 450mm (18") below the gate well lid.

3.11 METER BOX INSTALLATIONS

Meter boxes shall be installed at the elevations and locations shown on the Approved Plans and in accordance with the Standard Drawings. Near the completion of the project, a final meter box adjustment to finish grade may be required. Water meters shall not be installed until final adjustments are made to the meter box and are approved by the District Engineer.

3.12 INSTALLATION OF TEMPORARY END CAPS TO MAINTAIN SERVICE

Before excavating for new mains that are to replace existing pipes or services, it may be necessary to install temporary end caps on existing pipes that are later to be abandoned or connected in order to maintain service to customers or fire protection during construction. When indicated on the Approved Plans or when directed by the District Engineer, Contractor shall install and maintain such temporary end caps as indicated below and in accordance with the Standard Drawings.

A. For existing water mains 350mm (14") or less in diameter, the existing pipe shall be cut cleanly and fitted with a rubber-gasketed ductile-iron solid end cap specifically designed for the size and type of pipe being temporarily capped. The temporary end cap shall be adequately braced with a concrete thrust block poured against undisturbed material or as otherwise required to insure that no

movement or leakage occurs.

B. Temporary end caps shall be fitted with 50mm (2”) tapped outlets in accordance with the Standard Drawings to provide temporary 50mm (2”) blow-offs or connections to temporary water sources if indicated on the Approved Drawings or if directed by the District Engineer.

C. Existing pipes 400mm (16”) or larger shall not be fitted with temporary end caps.

3.13 PERMANENT ABANDONMENT OF PIPELINES AND APPURTENANCES

When indicated on the Approved Plans or when directed by the District Engineer, existing pipelines to be abandoned shall be disconnected from all source pipelines and shall remain in place in accordance with the Standard Drawings and the modifications and instructions listed below:

A. All above-ground appurtenances connected to pipelines to be abandoned shall be removed and disposed of or salvaged in accordance with this Section.

B. All piping and appurtenances buried at a depth of 600mm (24”) or less and connected to pipelines to be abandoned shall be removed and disposed of or salvaged in accordance with this Section. Remaining pipe ends, gate wells, and other appurtenances cut at a depth of 600mm (24”) shall be removed entirely or filled with concrete. Excavated areas shall be replaced with compacted backfill and surfaces shall be repaired in accordance with these Standard Specifications.

C. Pipe 100mm (4”) and smaller to be abandoned shall be excavated at intervals of 60m (200’), short sections of pipe shall be removed, and pipe ends shall be encased in concrete.

D. Pipe 150mm (6”) through 350mm (14”) to be abandoned shall be excavated at intervals of 60m (200’), and pipe shall cut and plugged with concrete in accordance with the Standard Drawings or shall be entirely filled by pressure-grouting.

E. When existing pipe 350mm (14”) or less is excavated for abandonment, each excavation is considered as a single “cut-and-plug.”

F. Abandoned pipe 400mm (16”) and larger shall be entirely filled by pressure-grouting or by blown sand.

G. Ends of all pipe segments to be abandoned shall be filled with concrete in accordance with the Standard Drawings.

H. All valves on pipelines to be abandoned shall be turned to the closed position.

I. Water services to be abandoned that are connected to pipelines that will remain in service shall be abandoned in-place and deactivated at the corporation stop in accordance with the Standard Drawings. Water services connected to pipelines to be abandoned shall be abandoned in-place and cut ends shall be crimped.

3.14 REMOVAL OF PIPELINES AND APPURTENANCES

A. Existing pipe and appurtenances shall be completely removed when indicated on the Approved Plans or as directed by the District Engineer. All materials removed during construction operations shall be salvaged or disposed of in accordance with this Section.

B. When fittings, appurtenances, or pipe segments are removed from pipelines that are to remain in service, the removed portions shall be replaced with straight segments of pipe and appropriate couplings selected from the Approved Materials List.

C. Removal of asbestos-cement pipe (ACP) and appurtenances shall be in accordance with all applicable State and Federal requirements, and disposal shall be in accordance with the requirements of this Section.

D. Backfill, compaction, and surface repair of all excavations for removal of pipe and appurtenances shall be made in accordance with the Approved Plans, these Standard Specifications, and in accordance with the requirements of the agency of jurisdiction or as directed by the District Engineer.

3.15 RECONNECTIONS

Existing service laterals or appurtenances shall be connected to new pipelines. Contractor may encounter unused service laterals or piping appurtenant to an existing pipeline being replaced. Laterals and appurtenant piping that will not be connected to new pipelines shall be abandoned in accordance with the requirements of this Section.

3.16 SALVAGE

When the Contractor is required to remove existing pipe and appurtenances, such materials may, when shown on the Approved Plans or directed by the District Engineer, be considered salvage. All materials identified as salvage are considered property of the District. The Contractor shall temporarily stockpile all material identified as salvage in a location that will not disrupt traffic or otherwise create an unsafe condition and shall deliver such materials as directed by the District Engineer.

3.17 DISPOSAL

All materials removed during construction operations and not identified by the District Engineer as salvage shall be legally disposed of in accordance with all applicable Local, State, and Federal requirements.

Disposal of asbestos-cement pipe requires special handling and attention, including but not limited to, encapsulation within airtight packaging, submittal of certification letters and/or waste profile statements, and the use of a Cal-OSHA registered asbestos abatement contractor to transport and dispose of such wastes. The District Engineer shall be provided with copies of all applicable documentation regarding the transportation and disposal of asbestos-cement pipe. Contractor shall comply with all

applicable regulations and all requirements of the disposal site. Contractor is responsible for all costs associated with disposal of materials, specifically including any materials that may contain asbestos.

END OF SECTION

Revision History

Date	Approval	Change description
7/22/2021		Clarifications and edits to Sections 1.13, 2.08, 2.10, 2.11, 2.12, 2.13, 3.4, 3.6, 3.12, 3.13, 3.14, 3.16, 3.17
11/3/21		2.12, A. remove reference to meter boxes, (see W drawings), and delete B. Meter box lids “sliver”..

SECTION 15041

DISINFECTION OF PIPE AND WATER STORAGE FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION

This section describes requirements for disinfection by chlorination of potable water mains, services, pipe appurtenances and connections.

1.02 REFERENCED STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for:

AWWA B301	Standard for Liquid Chlorine
AWWA C651	Disinfecting Water Main
AWWA C652	Tank Disinfection

1.03 RELATED WORK SPECIFIED ELSEWHERE

Section 15056	Ductile Iron Pipe and Fittings
Section 15064	PVC Pipe (C900)
Section 15070	PVC Pipe (C905)
Section 15076	CML&C Steel Pipe and Specials

1.04 SERVICE APPLICATION

A. All water mains and appurtenances taken out of service for inspection, repairs, or other activity that might lead to contamination shall be disinfected before they are returned to service.

B. All new water mains and temporary high lines shall be disinfected prior to connection to the District's existing system.

C. All components incorporated into a connection to the District's existing system shall be disinfected prior to installation.

1.05 SUBMITTALS

A. A written disinfection and dechlorination plan signed by a certified chlorinator shall be submitted to the District for review and approval prior to starting disinfection operations.

B. A Record of Disinfection shall be provided to the District water quality staff prior to sampling. The Record of Disinfection shall include the time of injection, time length of injection and log of disinfection. Disinfection must be completed by a licensed and certified company.

1.06 DELIVERY, STORAGE AND HANDLING

Chlorination and dechlorination shall be performed by competent individuals knowledgeable and experienced in the operation of the necessary application and safety equipment in accordance with applicable Federal, State and Local laws and regulations. The transport, storage and handling of these materials shall be performed in accordance with Code of Federal Regulations (CFR), and the California Occupational and Health Administration (Cal-OSHA) - California Code of Regulations (CCR), Title 8.

1.07 DISINFECTION AND HYDROSTATIC TESTING

The specified disinfection of the pipelines shall not be performed concurrently with the hydrostatic testing. Disinfection shall only be performed after lines have been flushed and have passed hydrostatic tests per Section 15044.

1.08 CONNECTION TO EXISTING MAINS

Prior to connection to existing mains, disinfection and bacteriological testing shall be performed in accordance with this specification, and hydrostatic testing shall be performed per Section 15044. District authorization for connection to the existing system shall be given only on the basis of acceptable hydrostatic, disinfection and bacteriological test results.

PART 2 MATERIALS

2.01 SODIUM HYPOCHLORITE (LIQUID)

Sodium hypochlorite is available in liquid form in glass or plastic containers, ranging in size from 1 qt. to 5 Gal. The solution contains approximately 10% to 15% available chlorine.

2.02 GRANULAR HYPOCHLORITE

Granular hypochlorite may be used when mixed into a solution containing approximately 10% to 15% available chlorine. When using granular hypochlorite in solution, follow the procedure for sodium hypochlorite solution in this section

PART 3 EXECUTION

3.01 GENERAL

A. Disinfection of pipelines shall not proceed until all appurtenances and any necessary sample ports have been installed and the District Engineer provides authorization.

B. Every effort shall be made to keep the water main and its appurtenances clean and dry during the installation process.

C. All piping, valves, fittings, and appurtenances which become contaminated during installation shall be cleaned, rinsed with potable water, and then sprayed or swabbed with a 5% sodium hypochlorite disinfecting solution prior to installation.

D. Water mains under construction that become flooded by storm water, runoff, or ground water shall be cleaned by draining and flushing with metered potable water until clear water is evident. Upon completion, the entire main shall be disinfected using a method approved by the Engineer.

3.02 METHODS

A. Sodium Hypochlorite Solution (Liquid)

1. Sodium hypochlorite solution shall be used for cleaning and swabbing piping and appurtenances immediately prior to installation and for disinfecting all components of connections to the District's existing system.

2. Sodium hypochlorite solution may be used for the initial disinfection of newly installed water mains. The solution shall be applied at a terminus of the system to be chlorinated using an injector which can adjust the amount of solution being injected into the piping system. The solution shall be injected at the appropriate concentration to achieve the specified concentration range of chlorine throughout the entire piping system. Where pumping equipment is used in conjunction with an injector, an integral backflow prevention device shall be installed and connected to the potable water supply.

3. Pumping equipment, piping, appurtenances and all other equipment in contact with potable water shall be disinfected prior to use. Water trucks shall not be used for disinfection of pipelines.

4. Sodium hypochlorite solution may also be used to increase the total chlorine residual if the concentration from the initial chlorination of the system is found to be low. The solution shall be added to the system in sufficient amounts at appropriate locations to ensure that the disinfecting solution is present at a concentration within the specified range throughout the piping system.

3.03 PROCEDURE FOR DISINFECTING WATER MAINS AND APPURTENANCES

A. The pipeline shall be filled at a rate not to exceed 300 GPM or a velocity of 1 foot per second (156 GPM in an 8-inch pipe), whichever is less.

B. Disinfection shall result in an initial total chlorine concentration of 50 ppm to 150 ppm. This concentration shall be evenly distributed throughout the system to be disinfected.

C. All valves shall be operated with the disinfection solution present in the pipeline. All appurtenances such as air-vacuum relief valves, blowoffs, hydrants, backflow prevention devices, and water service laterals shall be flushed with the treated water for a sufficient length of time to ensure a chlorine concentration within the specified range in all components of each appurtenance. (Note the limitations for discharge of chlorinated water outlined below.)

D. The Contractor will verify the presence of the disinfection solution throughout the system by sampling and testing for acceptable chlorine concentrations at the various appurtenances and/or at the test ports provided by the Contractor. Areas of the system found to be below

the specified chlorine concentration level shall receive additional flushing as noted above and/or additional disinfection solution as necessary. (Note the limitations for discharge of chlorinated water outlined below.) All testing will be done in the presence of the District Engineer.

E. The chlorinated water shall be retained in the system for a minimum of 24 hours. The District Engineer will test the total chlorine residual. The system shall contain a total chlorine residual of not less than 80% of the initial total chlorine residual before the 24-hour soaking period began. If the total chlorine residual has decreased more than 20%, the system shall be soaked for an additional 24-hour period. If the total chlorine residual has not deceased after this additional 24-hour period, the system shall be flushed in accordance with the procedure detailed herein. If the total chlorine residual has decreased, the system shall be flushed in accordance with the procedure detailed herein, and shall be re-disinfected.

F. Following a successful retention period as determined by the District Engineer, the chlorinated water shall be flushed from the system at its extremities and at each appurtenance, using potable water from a source designated by the District Engineer. The minimum water velocity during flushing shall be 3 feet per second or as directed by the District Engineer. Flushing shall continue until the replacement water in the new system is equal in chlorine residual to the potable source of supply as verified by the District Engineer. (Note the limitations for discharge of chlorinated water outlined below.)

G. The District will collect water samples and a California State certified drinking water laboratory firm will perform bacteriological testing, in accordance with paragraph 3.05 below, and provide a certificate of compliance to the District Engineer that the unit tested met the AWWA C651 requirements.

3.04 DISINFECTION OF WATER-STORAGE FACILITIES

Disinfection of water storage facilities shall be done in accordance with AWWA – C652.

3.05 DISCHARGE OF CHLORINATED WATER

A. Indiscriminate onsite disposal or discharge to sewer systems, storm drains, drainage courses or surface waters of chlorinated water is prohibited.

B. The environment to which the chlorinated water is to be discharged shall be examined by the Developer, Certified Chlorinator, and the District Engineer. Where necessary, federal, state and local regulatory agencies shall be contacted to determine special provisions for the disposal of chlorinated water. Any discharge of chlorinated water to the environment shall require the neutralizing of the chlorine residual by means of a reducing agent in accordance with AWWA C651, San Diego Regional Water Quality Control Board (SDRWQCB), Standardized Best Management Practices for Portable Water Discharges in Region 9 and the requirements of this specification.

C. A chlorine reducing agent shall be applied to the water prior to exiting the piping system. The Certified Chlorinator shall monitor the chlorine residual during the discharge operations. Total residual chlorine limits in these locations, and for the discharge of chlorinated water from the testing of pipelines to surface waters of the San Diego Region are as follows:

Total Residual Chlorine Effluent Limitations

Instantaneous Maximum - 0.02 ppm

The various methods of dechlorination available can remove residual chlorine to concentrations below standard analytical methods of detection, 0.02 ppm, which will assure compliance with the effluent limit. The Contractor will perform all necessary tests to ensure that the total residual chlorine effluent limitations listed above are met.

3.06 BACTERIOLOGICAL TESTING

A. Owner shall collect required water samples and administer testing.

B. The evaluation criteria employed by the District for a passing test sample is as follows:

1. Coliform bacteria: no positive sample

2. Heterotrophic plate count (HPC): 500 colony forming units/mi or less.

3.07 REDISINFECTION

If the initial disinfection fails to produce satisfactory bacteriological test results, the pipeline system shall be re-flushed and re-sampled. If the second set of samples does not produce satisfactory results, the pipeline system shall be re-chlorinated, flushed, and re-sampled. The chlorination, flushing, and sampling procedure shall continue until satisfactory results are obtained. Re-disinfection and retesting shall be at the Contractor's expense.

3.08 DISINFECTING TIE-INS AND CONNECTIONS

Pipes, fittings, valves and all other components incorporated into connections with the District's existing system shall be spray disinfected or swabbed with a liquid chlorine solution in accordance with AWWA C651 and as specified herein. Upon connection to the main, the line shall be flushed as directed by the District Engineer. Disinfection by this method is generally limited to assemblies of 20-feet or less in length. Alternate methods such as "pre-disinfection" prior to installation in accordance with AWWA C651 may be required at the discretion of the District Engineer.

END OF SECTION

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SECTION 15044

HYDROSTATIC TESTING OF PRESSURE PIPELINES

PART 1 GENERAL

1.01 DESCRIPTION

This section describes the requirements and procedures for pressure and leakage testing of all pressure mains.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for:

AWWA C600 Installation of Ductile Iron Water Mains

1.03 RELATED WORK SPECIFIED ELSEWHERE

Section 15041 Disinfection of Pipe
Section 15112 Backflow Prevention

1.04 REQUIREMENTS PRIOR TO TESTING

A. All piping, valves, fire hydrants, services, and related appurtenances shall be installed prior to testing.

B. The pipe trench shall have trench zone backfill placed and compacted with a minimum of 2.5 feet of material over the pipe.

C. All concrete anchor blocks shall be allowed to cure a sufficient time to develop a minimum strength of 2,000 psi before testing.

D. Pressure tests on exposed and aboveground piping shall be conducted only after the entire piping system has been installed and attached to pipe supports, hangers or anchors as shown on the Approved Plans.

E. Steel pipelines shall not be tested before the mortar lining and coating on all pipe lengths within the line have been in place for a minimum of seven (7) days. Cement-mortar lined pipe shall not be filled with water until a minimum of eight hours has elapsed after the last joint has been mortared.

1.05 HYDROSTATIC TESTING AND DISINFECTION OF PIPELINES

Hydrostatic testing of pipelines shall be performed prior to the disinfection operations in accordance with Section 15041.

1.06 CONNECTION TO EXISTING MAINS

Hydrostatic testing shall be performed prior to connections to existing mains. District authorization for connection to the existing system shall be given only on the basis of acceptable hydrostatic, disinfection and bacteriological test results.

PART 2 MATERIALS

2.01 WATER

A. Potable water shall be used for hydrostatic testing of potable water mains when such testing is performed separately from disinfection operations.

B. Potable water shall be supplied by a District approved source. Make-up water for testing shall also be potable water.

C. Well water shall not be used for hydrostatic testing or any other purposes in new or existing pipelines.

2.02 CONNECTIONS

A. Testing water shall be supplied through a metered connection equipped with a backflow prevention device in accordance with Section 15112 at the point of connection to the potable water source used.

B. The Contractor shall provide any temporary piping needed to deliver potable water to the piping that is to be tested.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall provide the District Engineer with a minimum of five (5) working days notice prior to the requested date and time for hydrostatic tests.

B. The Contractor shall furnish all labor, materials, tools, and equipment for testing.

C. Temporary blocking during the tests will be permitted only at temporary plugs, caps or where otherwise directed by the District Engineer.

D. All valves and appurtenances shall be operated during the test period. The test shall be conducted with valves in the open position.

E. At the onset of testing, all valves, air vacuum assemblies, blowoffs, and services shall be monitored for possible leakage and repairs made, if necessary, before the test proceeds. The appurtenances shall be monitored for the duration of testing.

F. For pipe with porous lining, such as cement mortar, the pipe shall be filled with water and placed under a slight pressure for a minimum of two (2) working days prior to the actual hydrostatic test.

3.02 FIELD TEST PROCEDURE

A. Before applying the specified test pressure, care shall be taken to release all air within the pipe and appurtenances to be tested. Air shall be released through services, fire hydrants, air release valves, or other approved locations.

B. A five (5) hour hydrostatic pressure test shall be performed after the pipe and all appurtenances have been installed and after any trench backfill compaction with heavy-duty compaction equipment has been completed. The hydrostatic test pressure shall be 50 psi above the class rating of the pipe at the lowest point in the section being tested and shall be at least equal to the design class of the pipe at the highest point in the line.

C. The test pressure shall be applied and continuously maintained by pumping for a period of four (4) hours. During the pumping phase of the test, the test pressure shall be maintained within 5 psig of the specified test pressure at all times.

D. At the end of the fourth (4th) hour, the pressure shall meet the requirements stated above. Pumping shall then be discontinued for one (1) hour and the drop in pressure shall be recorded. Pumping shall then be resumed to restore the initial test pressure, and the quantity of water pumped into the line shall be accurately measured. This measured quantity shall not exceed that which would result from leakage at the following rates:

1. The allowable leakage for steel (flanged or welded) and ductile iron (flanged) pipe shall be zero.

2. The leakage for polyvinyl chloride (PVC) pipe and for steel or ductile-iron pipes with rubber joints shall be considered as the total amount of water pumped into the pipe system after the fifth (5th) hour of testing. Allowable leakage during the fifth (5th) hour shall be in accordance with AWWA C600-99 and calculated using the following formula:

$$L = \frac{S * D * (P)^{0.5}}{133{,}200}$$

L = testing allowance (gallons / hour)
S = length of pipe tested (feet)
D = nominal diameter of pipe (inches)
P = average test pressure during test (pounds / sq. inch (gage))

3. If leakage exceeds the allowable loss, the leak points shall be located and repaired as required by the District Engineer. All defective pipe, fittings, valves, and other appurtenances discovered shall be removed and replaced with reliable material. Additional disinfection shall be performed as necessary per Section 15041. The hydrostatic test shall be repeated until the leakage does not exceed the rate specified above. All visible leaks shall be similarly repaired.

END OF SECTION

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SECTION 15076

CEMENT-MORTAR LINED AND COATED (CML&C) STEEL PIPE

PART 1 GENERAL

1.01 DESCRIPTION

This section designates the requirements for steel pipe fabrication, test in shop, installation of steel pipe, fabrication of steel sheet or plate, mill-manufactured steel pipe, bends, special pipes with outlets, pass holes, flanges and all other fittings. Steel pipe shall conform to the following except as modified by this Specification:

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for:

AWWA C200	Steel Water Pipe 6-inches and larger
AWWA C205	Cement-mortar protective lining and coating
AWWA C207	Steel Pipe Flanges
AWWA C210	Coal-tar epoxy coating system for interior and exterior of steel water pipelines
AWWA C213	Fusion-Bonded epoxy coating for the interior and exterior of steel water pipelines
AWS	Standard Qualification Procedure for Manual Welding Operators
ASME	Boiler and Pressure Vessel Code

1.03 RELATED WORK DESCRIBED ELSEWHERE

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

Section 09900	Painting and Coating
Section 15041	Disinfection of Piping

1.04 SUBMITTALS

The Contractor shall furnish submittals in accordance with Section 1 General Conditions. Submittals are required for the following:

A. Submit Shop Drawings, material lists, manufacturer's literature and catalog cuts of, but not limited to, the following:

Shop Drawings	Fabrication Details
Layout Schedule	Dimensional Checks
Manufacturer's tests	Protective Coatings
Mill Reports or Plant Test Reports	Welding Rods for Field Welding

B. Shop Drawings shall be submitted and approved prior to manufacture of pipe. The layout schedule shall indicate the order of installation, the length and location of each pipe section and special, the station and elevation of the pipe invert at all changes in grade, and all data on curves and bends for both horizontal and vertical alignment.

C. Submit data used by the Contractor in manufacture and quality control.

D. Test reports showing the physical properties of the rubber used in the gaskets shall be submitted.

PART 2 MATERIALS

2.01 PIPING

A. Steel pipe shall conform to AWWA C200. The steel for the cylinder shall be designed for a minimum of 300 psi working pressure and 36,000 psi minimum yield strength conforming to requirements for ASTM A36. Steel cylinder thickness shall be **No. 10 gauge (0.135 in.) minimum**.

B. Fittings for steel pipe shall conform to the dimensions of AWWA C208 and shall be made of segmentally welded sections of hydrostatically tested pipe (same material and thickness), with ends compatible for type of joints shown. The minimum radius of elbows shall be 2.5 times the pipe diameter and the maximum miter angle on each section of elbow shall not exceed 11.25 degrees. Fittings shall be equal in pressure design strength and shall have the same lining and coating as the abutting pipe.

C. Steel pipe joints shall be welded, unless otherwise indicated. Closure pieces shall be butt-straps. The straps shall be furnished in one or two sections, requiring one or two longitudinal welds in addition to the circumferential fillet welds. Provide steel flanges, welded to pipe where indicated. **Flanges shall be in accordance with AWWA C207 Class E**. Linings or coatings shall be continuous to the end of the pipe or back of the flange. Flange faces shall be shop cloth-inserted rubber. Bolts on buried flanges shall be Type 316 stainless steel with coal tar epoxy applied after installation.

D. Cement mortar lining for steel pipes shall conform to the following:

1. Except as otherwise provided in AWWA C205, the interior of all steel pipe, fittings and specials, shall be cleaned and lined in the shop with cement mortar lining applied centrifugally in conformance with AWWA C205. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at the construction site, the damage or unsatisfactory portions shall be replaced with lining conforming to these specifications.

2. The pipe ends shall be left bare where field joints occur. Ends of the lining shall be left square and uniform. Feathered or uneven edges will not be permitted.

3. Defective linings as identified in AWWA C205 shall be removed from the pipe wall and shall be replaced to the full thickness required. Defective linings shall be cut back to a square shoulder in order to avoid feather-edged joints.

4. 5-inch minimum hand holes shall be required, unless directed otherwise by the District Engineer, to facilitate interior lining repairs at all joints.

E. Cement mortar coating for steel pipes shall conform to the following:

1. All buried pipe shall receive a ¾-inch thick reinforced cement mortar coating. The coating shall be reinforced with spirally wound No. 14 gauge steel wire spaced at 1-½ inch centers positioned approximately at the center of the mortar coating. In lieu of a spirally wound wire, a wire mesh or wire fabric may be used. The mesh or fabric shall be fastened with welded wire clips or strips of metal so as to hold the wire approximately at the center of the mortar coating. Splices shall be lapped four inches and the free ends tied or looped to ensure continuity.

2. After the welding is completed, the outside annular spaces between pipe sections shall be completely filled with grout. The grout shall be poured in such a manner that all exposed portions of the metal joint shall be completely protected with cement mortar. Grout used on the outside of joints shall be non-shrink grout, sufficiently fluid to permit it to be poured down one side of the pipe and allowed to flow up the other side. The outside mortar joints shall be properly formed by the use of heavy-duty diapers or grout bands.

2.02 STEEL BAR OR WIRE REINFORCEMENT

Circumferential steel bar or wire reinforcement shall conform to ASTM A615, Grade 60, "Specifications for Billet-Steel Bars for Concrete Reinforcement". Wire fabric reinforcing for cement-mortar coatings and linings of fittings shall conform to ASTM A185, "Specifications for Welded Steel Wire Fabric," or ASTM A497, "Specifications for Welded Deformed Steel Wire Fabric." Spiral-wire reinforcement for cement-mortar coatings shall conform to ASTM A82.

2.03 STEEL FOR JOINT RINGS

Steel for bell rings shall conform to ASTM A575, "Specification for Merchant Quality Hot Rolled Carbon Steel Bars." Steel for spigot rings shall conform to ASTM A576, "Specification for Special Quality Hot-Rolled Carbon Steel Bars."

2.04 MANUFACTURER'S TESTS

A. Each steel cylinder with joint rings attached and cylinders for specials shall be hydrostatically tested to a circumferential stress of at least 22,000 psi, but not more than 25,000 psi. If leaks develop during testing, the cylinder shall be repaired by welding and retested until all leaks are eliminated.

B. The seams in short radius bends and special fittings shall be tested by the air-soap method using air at a pressure of 5 psi or by the dye-check method. However, if the fitting is fabricated from cylinders which have been previously hydrostatically tested, no further test will be required on seams so tested.

C. Hydrostatic testing of fittings to 150% of the design pressure may replace the tests described above. Any defects revealed by any of the alternate test methods shall be repaired by welding and the fitting retested until all defects have been eliminated.

2.05 FABRICATION DETAILS

A. Each special and each length of straight pipe shall be plainly marked at the bell end to identify the design pressure and the proper location of the pipe or special by reference to layout schedule.

B. Exposed portion of joint rings shall be protected from corrosion by the manufacturer's standard coating.

2.06 HANDLING AND SHIPMENT

Pipe and special fittings shall be handled carefully, and blocking and holddowns used during shipment shall prevent movement or shifting. Both ends of pipe and fittings on trucks or rail cars shall be bulkheaded or covered in order to prevent excessive drying of the interior lining.

PART 3 EXECUTION

3.01 INSTALLATION

A. Trench Preparation: Earthwork shall be carried out in accordance with Section 02200, Earthwork. Pipe laying shall be scheduled so that the bell end of the pipe faces in the direction of laying. Pipe installation on slopes steeper than 20% shall be laid in an uphill direction. Prior to laying the pipe, the bottom of the trench shall be graded and prepared to provide uniform bearing throughout the entire length of each joint of pipe. Suitable bell holes shall be excavated at each joint and a shallow lateral depression shall be scooped out half a pipe length from the last pipe laid to allow for easy removal of the belt pipe sling and thus avoid any movement of the pipe after it is placed on proper line and grade.

B. Butt-Strap Closure Joints: Butt-strap closure joints shall be completed in the trench after the pipe has been laid to the alignment and grade shown on the Plans. They shall be field welded by full-circumferential fillet welds or one of the edges may be shop welded and the other field welded. Welding shall be done in the same manner as specified for welded joints. Butt-straps shall include 5 inch hand-holes for accessing the interior of the pipe for grouting and inspection.

1. The interior of the joints shall be filled with stiff plastic mortar and finished off smoothly with the inside of the pipe. Once the grouting is inspected via the hand-hole, the interior side of hand-hole cap shall have wire welded to the cap and be grouted, and then welded to hand-hole.

2. Wire mesh, 2-inch by 4-inch by No. 13 gauge, clean, and free from rust, shall be applied to the exterior of the joints so that the wires on the 2-inch spacing run circumferentially around the pipe. The wires on the 4-inch spacing shall be crimped in such a manner that the mesh will be held 3/8-inch from the metal joint surface. The mesh shall be lapped a minimum of 8-inches and shall be securely wired in position.

3. The joint exterior shall be coated with mortar to a minimum thickness of 1½-inches. Immediately prior to applying mortar to the interior or exterior of the joints, a cement wash shall be applied to the metal to be coated.

C. Welded Joints: Welded joints shall be completed after the pipe is in final position. Welded joints shall be a lap-welded slip joint as shown on the Plans. Any recess between the bell and spigot shall be caulked with a rod to facilitate the welding. Pipe of 30-inches in diameter or more may be welded from the inside. Welders assigned to the Work shall be qualified under the AWS standard qualification procedure.

1. Joints to be welded shall be cleaned, preferably prior to placing the pipe in the trench, of all loose scale, heavy rust, paint, cement, and grease. At least a 1/2-inch recess shall be provided between adjacent mortar-covered surfaces to place the weld. In all hand welding, the metal shall be deposited in successive layers and the minimum number of passes or beads in the completed weld shall be as follows:

Steel Cylinder Thickness (Inches)	Fillet Weld Minimum Number of Passes
Smaller than 1/8”	1
1/8”	2
5/16 and larger	3

2. After the joints have been welded, the joint shall be grouted with cement mortar.

D. Mortar line Field Joints for all welded pipe under 24-inch diameter as follows:
(OPTION 1)
1. Mix Stiff Mortar: One-part cement (Type II or V, per ASTM C150) to two parts sand with water to make a stiff mix of dry pack consistency.
2. Insert a tight-fitting ball swab or squeegee in bell end of pipe in trench.
3. Mortar line face of shop mortar lining in pipe bell. Apply enough mortar to fill space between shop mortar linings of the two pipes being joined.
4. Clean and insert spigot end of next pipe into mortar-buttered pipe bell.
5. Immediately after joining pipes, draw ball swab or squeegee through pipe to remove all excess mortar and expel it from open pipe end.
6. Do not move the pipe after ball swab has been pulled.
7. For pipes with field welded joints, immediately after pulling swab, tack weld joint in two places, then let mortar cure 4 hours minimum before welding. Welding with fresh mortar evaporates too much water and fails lining. Welding on cured mortar causes a small crack which self-heals when immersed. Then apply joint coatings.
8. Video inspect by robotic camera mortar lined joints not inspected manually.

(OPTION 2)
9. Alternatively, 5-inch minimum hand holes may be utilized for grouting field joints on pipe under 24-inch diameter. Joints grouted with hand holes shall be video inspected by robotic camera, not inspected manually, or as directed by the inspector.

3.02 PREVENTING FOREIGN MATTER FROM ENTERING THE PIPE

At all times when 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 hour as well as overnight. In no event shall the pipeline be used as a

drain for removing water which has infiltrated into the trench. The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the District Engineer.

3.03 PRESSURE TEST

All pipelines shall be tested in accordance with Section 15044, Hydrostatic Testing of Piping. Zero leakage is allowed and all visible leaks must be repaired regardless of the results of the leakage allowance measurements.

3.04 DISINFECTION

Disinfection shall be in accordance with Section 15041, Disinfection of Piping.

END OF SECTION

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SECTION 15100

VALVES

PART 1 GENERAL

1.01 DESCRIPTION

This section includes materials, testing, and installation of manually operated valves, check valves, air and vacuum valves, air-release valves, and combination air-release valves.

1.02 REFERENCE STANDARDS

ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A193	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A194	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
ASTM A126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A276	Specification for Hot- and Cold-Finished Bars of Stainless and Heat-Resisting Chromium-Nickel-Manganese Steel
ASTM B62	Standard Specification for Composition Bronze or Ounce Metal Castings
AWWA C105	Polyethylene Encasement For Ductile Iron Piping For Water And Other Liquids
AWWA C500	Gate Valves For Water And Sewerage Systems
AWWA C504	Rubber Seated Butterfly Valves
AWWA C509	Resilient Seated Gate Valves For Water And Sewerage Systems

1.03 RELATED WORK SPECIFIED ELSEWHERE

FPUD	Standard Drawings
Section 09900	Painting and Coating
Section 15041	Disinfection of Piping

1.04 SUBMITTALS

Contractor shall furnish submittals in accordance with the requirements of Section 1 General Conditions. The following submittals are required:

A. Submit Shop Drawings, manufacturer's catalog data and detail construction sheets showing all valve parts and describing material of construction by material and specification (such as AISI, ASTM, SAE, or CDA). Submittal shall include valve dimensions including laying lengths, dimensions and orientation of valve operators, as installed on the valves. Submittals shall also indicate valve linings and coatings with manufacturer's and paint numbers listed.

B. For valves requiring certified tests, submit certified test results.

1.05 MASONRY RETAINING WALLS

If the aboveground portion of the assembly is located within a cut slope or embankment fill, a masonry retaining wall shall be constructed on three sides around the assembly per drawing W-16. The face of wall shall be a minimum of one foot beyond the dimensional values of the concrete pad to be poured for the assembly as shown on the Standard Drawings. Use tan colored slump block and grout each cell solid. The concrete pad to be poured around the assembly shall extend to the face of the three walls and also to the adjacent sidewalk or curb. The District Engineer will decide whether the requirements of this paragraph are being followed by the Contractor. If in the opinion of the District Engineer modifications or changes are necessary, the work shall be performed as directed.

PART 2 MATERIALS

2.01 GENERAL

All valves shall be new and of current manufacture. Valves shall be furnished and installed by the Contractor at the location and in accordance with the type of ends as shown on the Plans and as herein specified.

The manufacturer shall have manufactured tight-closing valves of the valve type intended for use for a period of at least five (5) years.

The Contractor shall furnish and install each specific type of valve from a single manufacturer and use it throughout the Work.

All valves shall have a rated working pressure of at least 150 psi. All valves shall be certified to meet the test pressure as specified and shall have a rated working pressure that exceeds the full working pressure specified.

A. Connections: Valves shall have flanged, hub, screwed, or special connector ends as shown on the Plans. Where not indicated, the valves shall have the same type of connection as the pipeline in which valves are to be installed and conform to the Specifications.

B. Bolts, Nuts and Washers: Bolts, nuts and washers for aboveground installations shall be cadmium plated and shall conform to ASTM A307, Grade B, "Steel Machine Bolts and Nuts and Tap Holes," when a ring gasket is used and shall conform to ASTM A193, "Alloy-Steel Bolting Material for High Temperature Service", when a full-face gasket is used. Bolts and nuts shall be heavy hexagon series. Nuts shall conform to ASTM A194, "Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service" either in Grade 1, 2, or 2H. The fit shall be ANSI B1.1, "Unified Screw Threads," Class 2, except that Class 3 fit shall be used in holes tapped for studs. Threads may be made by either cutting or cold forming. Between 1/4-inch and 3/8-inch shall project through the nut when drawn tight.

    1. Bolts, nuts and washers for underground installations including below ground structures shall be type 316 stainless steel. All buried bolts shall be completely coated with

Bitumastic No. 50, or approved equal, which must be applied in two coats to a minimum thickness of 15 mils per coat.

2. All aboveground bolt threads shall be lubricated with graphite and oil. Flanged faces shall be wire brushed and cleaned prior to joining each flange.

C. Polyethylene Encasement: Unless otherwise specified on the Plans, all valves for underground installation shall be encased in two layers of 8 mil polyethylene wrap in accordance with AWWA C105.

D. Painting and Coating: All valves referenced in this section shall be painted and coated, interior and exterior, in accordance with Section 09900, Painting and Coating.

2.02 PLUG VALVES - LUBRICATED

A. The valves shall be lubricated, tapered plug valves. The valves shall be a top entry, bolted gland design.

B. Unless otherwise specified, valves shall have cast iron bodies and tapered plugs with bolted ductile iron, malleable iron, or steel covers depending on pressure rating of the valves. Valve castings shall be of the very highest quality obtainable. The segment gear shall have the valve stops welded prior to installation as directed by District Engineer. Weld repair of cast iron castings is not permissible.

C. A ground valve plug shall be lapped to the body taper during the manufacturing process to establish an ultimate fit between these two items.

D. The valves shall be supplied with a sealant system which allows application of a sealing media to the metallic valve seats as a means of establishing drip-tight sealing. The valve shall be furnished with a single point of application sealant system, and shall incorporate a double ball check valve between the sealant application point and the sealant system to eliminate the potential for leakage of line media to atmosphere. The sealant application point of the valves shall be a combination ½-inch black iron sealant screw which allows use of injection equipment or sealant sticks. The combination sealant screw shall be of a piston check design which minimizes debris collection. Ball check sealant fittings shall not be furnished.

E. The valve shall be lubricated with a FDA and NSF approved lubricant suitable for potable water during installation. The lubricant shall be per the valve manufacturer's recommendation.

F. A flexible, stainless steel diaphragm shall be provided under the valve cover, and shall bear against the top of the plug to provide a primary stem seal mechanism. The valve cover shall be sealed to the body by non-asbestos containing gaskets loaded in place by capscrews.

G. A gland assembly shall be provided which shall control plug adjustment without working through compressible packing and shall not allow adjustment to be lost due to packing compression over time. Gland assembly shall have nitrile elastomer O-ring seals which bear against the plug shank and the valve cover as a provision for a secondary stem seal mechanism.

H. Enclosed worm gear operators shall be furnished. Wrench operated valves shall be available when specified on certain smaller sized valves. Gear operators shall be an integral part of the

valve design and shall provide for basic isolation of the valve adjustment gland, valve stops, etc., from the general environment. When specified, gearing shall be furnished as a tightly sealed waterproof design capable of withstanding 15-feet head of water, and such design shall also serve to totally protect the gland, and gland adjusting mechanism from the environment. Gearing shall consist of a ductile iron segment keyed to the valve stem.

I. The segment shall be driven by a hardened steel worm gear. Both the segment and the worm gear shall be dry film lubricated with molybdenum disulfide. The worm gear shall be attached to an input shaft which is supported by thrust bearings. The gearing shall be lubricated by a high quality extreme pressure gear grease.

J. Valve shall conform to Valve Manufacturer's Standardization Society Specification MSS SP-78; CAST IRON PLUG VALVES, FLANGED AND THREADED ENDS. The valve shall conform to the following standards, where applicable; ANSI B16.1, ANSI B1.20.1, ASTM-A 126, class B, MSS SP-6, MSS SP-25, and AWWA C110/A21.10-87. Face to face dimensions shall conform to ANSI B16.10.

K. The valve manufacturer shall offer a five (5) year warranty against defects in materials and workmanship.

L. The valves shall be a Venturi pattern design, and range in size from 4" - 24". The valves shall be rated for a minimum working pressure of 400 psi Cold Working Pressure (CWP) for sizes 4" - 12", and 300 psi CWP for sizes 14" - 24". The valves shall be hydrostatically shell pressure tested at twice the CWP rating. Each valve seat shall be tested at 150% CWP pressure in lieu of the SP-78 specified 110% CWP. The valve shall have flanged ends drilled to ANSI Class 250 Cast Iron Flange Templates.

M. Lubricated plug valves shall be selected from the Approved Materials List.

2.03 BUTTERFLY VALVES - NOT USED

2.04 RESILIENT WEDGE GATE VALVES

A. All valves shall be new and of current manufacture. Resilient wedge valves may be used only for nominal pipe sizes from 3-inches to 24-inches in diameter, unless specified on the plans or approved by the District Engineer.

B. Valves shall be furnished and installed with the type of ends shown on the Plans and as herein specified.

C. Valves shall be manufactured to meet all applicable requirements of the latest edition of AWWA C509. Flange drilling shall be in accordance with ANSI B 16.1 standard for cast-iron flanges.

D. Valves shall have non-rising stems, opening by turning counter-clockwise. Buried valves shall be provided with 2-inch square operating nut with arrow cast in metal to indicate direction of opening, and above ground valves shall be equipped with a handwheel. Valve stems shall be integral with stem collar and furnished of 316 Stainless Steel. Stem nuts shall be independent of the wedge and shall be made of 316 Stainless Steel. All body bolts shall be ANSI type 316 stainless steel.

E. Cast-iron wedge shall have sealing surfaces of the wedge permanently bonded with resilient material to meet ASTM tests for rubber to metal bond ASTM D429. Each valve shall have a smooth unobstructed waterway free from any sediment pockets. Stuffing boxes shall be O-ring seal type with two rings located in stem above thrust collar. Low friction torque reduction thrust bearings shall be located both above and below the stem collar.

F. Valves shall have hydrostatic shell test of 400 psi and shutoff test of 200 psi. At the 200 psi shutoff test the valve must be bubble tight - zero leakage will be allowed.

2.05 BALL VALVES - RUBBER SEATED

A. Ball valve shall be of the tight-closing, shaft-mounted type which fully complies with AWWA Standard C507 latest edition. Valve design shall eliminate metal-to-metal contact or wedging in the sealing action. The valve shall be designed to provide drip-tight shutoff against flow in both directions. Design of valve shall be such that, with the valve in the open position, the full and unobstructed circular inlet and outlet port diameter shall be as specified in Table 2 of AWWA Standard C507. With the valve in the closed position, valve shall be drip-tight at rated pressure.

B. The valve body shall have integral support legs or pads and shall consist of two body end pieces and a center body piece through-bolted and O-ring-sealed against leakage. All body pieces shall be of cast iron ASTM A126 Class B. Minimum body thickness shall be as specified in Table 3 of AWWA Standard C507. Unless otherwise specified, flanges shall be flat-faced, and flange drilling shall be in accordance with ANSI B16.1 standard for cast iron flanges.

C. The valve ball shall be constructed of cast iron ASTM A48, Class 40, and shall be taper-pinned to an upper and lower fitted shaft of 18-8 Type 316 stainless steel that is turned, ground and polished to a 32 micro-inch or smoother finish per ANSI B46.1. Valves employing chromium plated iron or steel shafts or trunnions are not acceptable.

D. The center section shall be fitted with sleeve-type bearings contained in the body hubs. Bearings shall be corrosion resistant and self lubricating, with minimum wall thickness of 1/4-inch. Material shall be teflon-lined with fiberglass backing. Bearing surfaces shall be isolated from flow by O-ring type seals. The ball assembly shall consist of a stainless steel stud and thrust collar in a grease-packed cavity.

E. All seats shall be of a synthetic rubber compound. Seats shall be retained in the valve body by mechanical means without retaining rings, segments, screws or hardware of any kind in the flow stream. Seats shall seal a full 360° without interruption and have a plurality of grooves mating with a spherical stainless steel seating surface on the ball. Valve seats shall be field adjustable around the full 360° circumference and replaceable without dismantling the operator, ball or shaft. Where line size permits, seats shall also be capable of being replaced or adjusted without removing the valve from the line. There shall be two (2) sets of ball and body seats to provide drip-tight closure in both directions. Manufacturer shall certify that the rubber seat is field adjustable and replaceable.

F. Ball valve shall be subjected to hydrostatic, shop leakage and performance tests as specified in Section 5.2 of AWWA Standard C507.

G. Valve actuator shall conform to the operating requirements of AWWA Standard C507 and shall be designed to hold the valve in any intermediate position between full open and full closed

without creeping or fluttering. Unless otherwise specified on the Plans the valve shall be equipped with a manual actuator of the self-locking type with mechanical stop-limiting devices to prevent over travel of the ball in the open or closed position with handwheel and position indicator for non-buried service. For buried service the valve shall be equipped with a 2-inch operating nut. Manual actuator shall be Pratt MDT or approved equal. Where cylinder actuators are specified, they shall be Pratt MDT with Dura-Cyl cylinder, or approved equal.

H. The manufacturer furnishing the valve(s) shall certify that the valve(s) meet the requirements of AWWA Standard C507.

2.06 AIR RELEASE AND VACUUM RELIEF VALVES

All assemblies shall be as shown on the Standard Drawings or as detailed on the plans. Valves and fittings shall equal or exceed the pressure rating of the pipe to which they are attached. The valve shall be a combination type and shall be sized as shown below. Air release and vacuum relief valves shall be selected from the Approved Materials List.

Pipe Size	Air Release/Vacuum Relief Size
<6”	1”
6” to 14”	2”
16” to 20”	4”
>20”	6”

A. Air and vacuum valves shall be capable of venting sufficient quantities of air as determined by the manufacturer’s approved sizing methods, while pipelines are being filled and allowing air to re-enter while pipelines are being drained.

B. Air and vacuum valves shall be of the size indicated, with flanged or screwed ends to match the piping.

C. Bodies shall be of high-strength cast iron or ductile iron.

D. The float, seat, and all moving parts shall be constructed of Type 316 stainless steel.

E. Seat washers and gaskets shall be of material insuring water tightness with a minimum of maintenance.

F. Valves shall be designed for minimum 250 psi working pressure, unless otherwise indicated.

G. Combination air/vacuum assemblies shall be installed on a section of pipe no closer than 18 inches to a bell, coupling, joint or fitting.

H. Air/vacuum assemblies and valve box assemblies shall be field coated with safety yellow paint according to Section 09900, unless specified on the plans or approved by the District Engineer.

I. All assemblies shall be installed above ground.

J. Assemblies shall be installed with a sanitary vent screen to the exhaust port of the valve, and selected from the Approved Materials List.

K. Assemblies installed will have an isolation valve to permit future maintenance. Isolation valves installed above ground will have the capability to be locked out. Isolation valves installed below ground will be required to have a debris cap with a locking device.

2.07 CORPORATION STOPS

Corporation stops shall be manufactured of bronze conforming to ASTM B62. The inlet fitting shall be a male iron pipe thread when used with a saddle and the outlet connection shall be a compression type unless otherwise specified.

2.08 HOSE BIBBS AND VALVES

Hose bibbs shall be furnished and installed in the locations shown on the Plans and shall be of the sizes required. They shall be brass hose valves, with National Standard threads, cap, and chain.

2.09 FLOW CONTROL VALVE

A. Overview: Electronically controlled valves are required and shall be designed to provide:
    a. Pressure relief of the discharge of the pump station (discharge manifold) into the suction line, as shown in the design plans, for both (2) pump systems. This valve is also known as a Surge Anticipator valve. A position limit switch shall be included to indicate when the valve has been operated. Pressure Indicating transmitters shall be provided for both sides of the control valve. The valve will be used to relieve pressure surges that may occur during pump station operation and allow for the upper zone to flow into the lower zone in a manually remoted controlled method.
    b. Flow Control Valve to control the flow from the High Pressure Zone (TOYON) to the lower pressure zone. (This is the same zone as the suction side of the TOYON pump station but discharged into a separate pipe.)
    c. Type of service: Potable Water
B. Electronic Control Valve, shall be designed specifically for applications where:
    a. Manufacturer and Product:
        a) Cla-Val Model 52-03 (Surge Anticipator)
        b) Cla-Val Model 49-01 (Flow control)
    b. Remote control of the valve is required.
    c. It is a hydraulically operated, pilot controlled, diaphragm valve.
    d. Solenoid pilot controls are actuated by electronic signals from the 131VC (below), which is designed to work flawlessly together.
    e. The position of the valve shall be transmittable via SCADA (position limiting switch).
    f. Type of end connection: flanged
    g. Size (inches): 6”
    h. Rating and description: Class 300, cast iron body, 304 stainless steel trim, internal epoxy coated, and Y-strainer.
    i. Position of the valve can also be controlled remotely to allow the high zone to flow into the low zone, when needed by the district.
C. Solenoid pilot controls are operated by electrical signals from Electronic Control Systems
    a. Manufacturer and Product:
        a) Cla-Val Model 131VC, or approved equal, compatible with electronically controlled valve.
    b. Designed to work in conjunction with the Model 50-01/650-01 (above),

c. Shall be programmable

D. Valve position transmitter shall also be included.
   a. Manufacturer and Product:
      a) Cla-Val Model X101, or approved equal, compatible with electronically controlled valve.
   b. Shall include 4-20mA output and accuracy required for SCADA.
   c. All Electronic components shall be enclosed in rugged, sealed aluminum and stainless steel housing.

E. Pressure Indicating Transmitters shall be included.
   a. Pressure gages (2) shall be located in the high zone and the low zone sides of the flow control valve.
   b. Pressure signals shall be provided and shall include 4-20mA output and accuracy required for SCADA.

2.10 VALVE COATING

A. Exterior Coating: Coat ferrous valves located above ground, in vaults or in structures the same as the adjacent piping. If the adjacent piping is not coated, then coat valves per this Specification section unless otherwise noted. Apply the specified prime coat at the place of manufacture. Apply intermediate and finish coats in the field. Finish coat shall match the color of the adjacent piping. Coat handwheels and floor stands the same as the valves. Coat the exterior of buried metal valves at the place of manufacture per this specification.

B. Exterior Coating (Above ground):
Shop prime coat: Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Touch-up (Field): Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 3.0 to 5.0 mils DFT.
Finish Coat: Tnemec Series 1075 Endura-Shield II @ 2.0 to 3.0 mils DFT.

C. Exterior Coating (Buried):
Shop prime coat: Tnemec Series 1 Omnithane applied at 2.5 to 3.5 mils DFT.
Shop Intermediate Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.
Shop Finish Coat: Tnemec Series V69 Epoxoline II applied at 4.0 to 6.0 mils DFT.

D. Interior Lining: Valves 4-inches and larger shall be coated on their interior metal surfaces excluding seating areas and bronze and stainless-steel pieces. Sandblast surfaces in accordance with SSPC-SP-10 (near white blast cleaning). 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:

1. Apply powdered thermosetting epoxy per the manufacturer's application recommendations to a thickness of 10 to 12 mils.

2. Apply two (2) coats of polyamide epoxy to a dry-film thickness of 10 to 12 mils total. Follow the manufacturer's application recommendations including minimum and maximum drying time between the required coats.

3. All epoxy lining shall be applied at the factory by the manufacturer of the valve, and shall meet current Volatile Organic Compound (VOC) content regulations.

Epoxy lining for potable water valves shall also be listed by National Sanitation Foundation (NSF) for contact with potable water.

4. Test the valve interior linings at the factory with a low-voltage holiday detector. The lining shall be holiday free.

PART 3 EXECUTION

3.01 INSTALLATION

A. Flanges shall be cleaned by wire brushing before installing flanged valves. Flange bolts and nuts shall be cleaned by wire brushing, and threads lubricated with NSF 61 approved product. Nuts shall be tightened uniformly and progressively. If flanges leak under pressure testing, nuts and bolts shall be loosened or removed, the gasket reseated or replaced, the bolts and nuts reinstalled or retightened, and joints retested. Joints shall be watertight.

B. Threaded joints shall be cleaned by wire brushing or swabbing. Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

3.02 VALVE PRESSURE TESTING

Valves shall be tested at the same time that the connecting pipelines are pressure tested and in accordance with Section 15044, Hydrostatic Testing of Pressure Pipe. Any parts of valves, operators, or control and instrumentation systems whose pressure rating is less than the test pressure shall be isolated and protected.

END OF SECTION

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