



**CALIFORNIA**  
**AMERICAN WATER**

**Technical Specifications**

**Bellflower Water  
Main Replacements**

City of Bellflower

**System 4**

**Glandon St, Cloverwood St, Maplewood St,  
Ardis Ave, Charlemagne St, Blaine Ave,  
Somerset Blvd**

Prepared by: Blair, Church & Flynn Consulting Engineers  
Date: June 27, 2023

**June 2023**

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## SECTION 01000

### SUMMARY OF WORK

#### **PART 1 - GENERAL**

##### 1.01 WORK UNDER THIS CONTRACT

The CONTRACTOR shall furnish all labor, materials, equipment and means to construct the project entitled **BELLFLOWER WATER MAIN REPLACEMENTS – SYSTEM 4**, as shown on the Drawings and described herein. The work includes, but is not limited to, the following:

Installation of new water main, fittings, valves, cut-in wyes, concrete thrust blocks and thrust restraint joints, USA Mark Out, pothole utilities, trench excavation, dewatering and backfill, site restoration, blow-offs, and related appurtenances, traffic control, pressure testing and disinfection, and existing main abandonment in accordance with the plans and specifications that are part of the contract and bid documents for this project and until satisfactory and final acceptance of the work by the OWNER. **An Explanation of Bid Items is included in Section 01075 of these Specifications.**

The above general outline of principal features does not in any way limit the responsibility of the CONTRACTOR to perform all work and furnish the required materials, equipment, labor and means as shown or required by the Contract Documents as required to provide a complete and functional project.

Materials, equipment, labor, etc., obviously a part of the work and necessary for the proper operation and installation of same, although not specifically indicated in the Contract Documents, shall be provided as if called for in detail without additional cost to the OWNER.

##### 1.02 LOCATION

All work is to be performed at locations shown in the project drawings and specifications for this project.

##### 1.03 WORK BY OTHERS

OWNER shall be responsible to notify and perform shut down. CONTRACTOR shall obtain encroachment permit and traffic control plans per the City of Bellflower requirements. OWNER shall perform bacteriological (bacti) testing.

#### 1.04 OWNER FURNISHED PRODUCTS

Not applicable

#### 1.05 CONTRACTOR USE OF SITE

- A. Access to site: Limited to areas noted on project drawings and as specified in Section 01410.
- B. Emergency building exits during construction: Not Applicable
- C. Construction operations: Limited to areas noted on project drawings and as specified in Section 01410.
- D. Time restrictions for performing work: Working Hour Restrictions as specified in Section 01410.
- E. Utility outages and shutdown: To be coordinated with Owner as needed and appropriate.

#### 1.06 FUTURE WORK

Not Applicable

#### 1.07 SEQUENCE OF WORK AND SPECIAL PROJECT REQUIREMENTS

- A. **Shutdowns.** The work shall be scheduled, sequenced and performed in a manner that minimizes disruption to the public water service. The CONTRACTOR shall notify the OWNER at least seventy-two (72) hours in advance of any requests for shutdown of portions of the water system. Shutdown of the water system, including operation of line valves, shall be performed by the OWNER as needed to facilitate construction of the project. A schedule, including time and duration of any anticipated shutdowns shall be submitted to the OWNER for approval prior to the start of construction.
- B. **Tapping.** The CONTRACTOR shall construct the tapping pit and set the tapping sleeve and valve at each location shown on the plans. The CONTRACTOR will perform the tap at all tapping locations.
- C. **Schedule.** The CONTRACTOR shall allow for construction and schedule constraints in preparing the construction schedules required under Section 01300: Submittals. The schedule shall include the CONTRACTOR'S activities necessary to satisfy all constraints included and referenced in the contract documents.

- D. **Sequence.** The anticipated construction sequence is as follows:
1. The CONTRACTOR shall be required to coordinate his work plan and schedule with the following:
    - a. City of Bellflower
    - b. California-American Water Los Angeles District Operations
  2. CONTRACTOR shall install swabbed and disinfected proposed piping, valves, fittings and appurtenances on shown on plans.
  3. CONTRACTOR shall pressure test and chlorinate per specification Division 15. The OWNER shall perform bacti testing.
  4. Following disinfection, successful pressure test and bacti testing, CONTRACTOR shall coordinate with OWNER to sequence shutdown of the existing 4-inch water mains to be replaced, install the swabbed & disinfected pipe for new tie-in connections, abandon in place existing sections of water main as indicated on plans, and fill abandoned valve boxes with cement-slurry.
- E. **Traffic Control.** The CONTRACTOR shall provide traffic control for project work locations in accordance with the plans. The CONTRACTOR shall prepare and submit a traffic control plan and obtain necessary over-the-counter traffic control permits for all project work as required prior to commencement of work as may be required by the City. The CONTRACTOR shall refer to the provisions contained on the plans for additional traffic control requirements.
- F. **Storm Water BMPs.** CONTRACTOR shall furnish, install and maintain Storm Water BMPs in accordance with local, county, and state requirements.

## 1.08 CHANGE PROCEDURES

- A. The Engineer may issue to CONTRACTOR a Proposal Request which includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Times for executing the change and the period of time during which the requested price will be considered valid. CONTRACTOR will prepare and submit an estimate within 15 working days. The estimate shall contain a detailed breakdown of the labor, equipment, material, subcontract, equipment rental, contingencies, overhead, and profit costs associated with the requested change. The estimate shall also include any requested adjustments to Contract Times including the window of time the OWNER has to render a decision on the matter.

## 1.09 DEFINED TERMS

Terms used in these Specifications which are defined in the General Conditions of the Contract Documents shall have the meanings assigned to them in the General Conditions.

#### 1.10 ABBREVIATIONS

Where any of the following abbreviations are used in the Contract Documents, they shall have the meaning set forth opposite each.

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
IEEE	Institute of Electrical and Electronics Engineers, Inc.
AISC	American Institute of Steel Construction
AMCA	Air Moving and Conditioning Association
ANS	American National Standard
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood-Preservers' Association
AWWA	American Water Works Association

CS	Commercial Standard
IBR	Institute of Boiler and Radiator Manufacturers
IPS	Iron Pipe Size
JIC	Joint Industry Conference Standards
NBS	National Bureau of Standards
NEC	National Electrical Code; Latest Edition
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc.
Fed.Spec.	Federal Specifications issued by the Federal Supply Service of the General Services Administration, Washington, D.C.
125lb ANS 250lb ANS	American National Standard for Cast-Iron Pipe Flanges and Flanged Fittings, Designation B16.1-1975, for the appropriate class
AWG	American or Brown and Sharpe Wire Gage
NPT	National Pipe Thread
OS&Y	Outside Screw and Yoke
Stl.WG	U.S. Steel Wire, Washburn and Moen, American Steel and Wire or Roebling Gage
UL	Underwriters' Laboratories
USS Gage	United States Standard Gage
WOG	Water, Oil, Gas
WSP	Working Steam Pressure

## **PART 2 - PRODUCTS**

Not Used.

## **PART 3 - EXECUTION**

### **3.01 FIELD SURVEY WORK**

- A. Unless otherwise provided in the Supplementary Conditions the OWNER shall provide engineering surveys to establish reference points for construction as provided in Article 4.4 of the General Conditions. Utilizing OWNER's reference points, the CONTRACTOR shall establish the initial control base line and all control bench marks to be utilized throughout the project. Base line shall be set in accordance with all lines, dimensions, reference points, and elevations given in the Contract Drawings.
- B. Should the CONTRACTOR detect a discrepancy between the information as presented in the Contract Drawings and any existing survey grid-work, bench marks, structures, etc., the CONTRACTOR shall notify the ENGINEER immediately. New construction shall not commence until accurate control base lines and bench marks have been established.
- C. The CONTRACTOR shall throughout the course of the project, set all additional stakes which are needed for offset stakes, reference points, slope stakes, pavement and curb line and grade stakes, stakes for structures, sewers, utilities, roadway drainage, pipe underdrains, paved gutter, fence, culverts, or other structures, supplementary bench marks, and any other horizontal or vertical controls necessary to secure a correct layout and construction of the work. Stakes for line and grade for pavements, curbs, storm drains, sewers, etc., shall be set at twenty-five (25) foot maximum intervals. Base lines shall be staked in such manner as to clearly define them for the project.
- D. It shall be the CONTRACTOR's responsibility that the finished work conforms to the lines, grades, elevations and dimensions called for in the Contract Documents. The Work shall be subject to checking by the ENGINEER, but any inspection or checking of CONTRACTOR's layout by the ENGINEER and the acceptance of all or part of it shall not relieve the CONTRACTOR of his responsibility to secure the proper dimensions, grades, elevations and locations on the several parts of the Work. The CONTRACTOR shall exercise care in the preservation of stakes, monuments and bench marks and shall have them reset at his expense when they are lost or displaced.
- E. Prior to the commencement of any Work activity, the CONTRACTOR shall survey and layout the Work to be performed and advise the ENGINEER of any conflicts, obstructions, concerns, etc. which will prevent completion of



such work in accordance with the requirements of the Contract Documents. If the CONTRACTOR fails to conduct such survey and layout or if the survey and layout fails to identify a conflict, obstruction, etc., which it reasonably should have, and a conflict, obstruction, concern, etc., is discovered, the CONTRACTOR shall bear the cost of any standby time for labor and/or equipment which occurs pending the ENGINEER's direction and the cost of rework of any Work installed which is affected by the conflict, obstruction, etc.

- F. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, the CONTRACTOR shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

### 3.02 COORDINATION AND MEETINGS

- A. The CONTRACTOR will be required to coordinate his work, to phase the construction operations, and provide, install and maintain any temporary connections necessary to prevent interference to operation of OWNER's facilities. Any construction work requiring the shut-down of facilities must be scheduled and performed only at such times as shall be authorized by the ENGINEER. Such work must be completed during the specific periods authorized by the OWNER. It may be necessary that work will be performed during several shut-down periods and/or during periods of premium time payment to accomplish the desired construction. All costs to perform the CONTRACTOR's work, including premium time payments, shall be borne by the CONTRACTOR and are included in the Contract price.
- B. In addition to the above, the CONTRACTOR shall:
  - 1. Coordinate scheduling, submittals, and work of the various sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
  - 2. Verify the utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
  - 3. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces

efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

4. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
5. Coordinate completion and clean up of Work of separate sections in preparation for substantial completion and for portions of Work designated for OWNER's partial occupancy.
6. After OWNER occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of OWNER's activities.

C. Job Progress Meetings

Progress meetings will generally be held bi-weekly. CONTRACTOR's attendance shall be required.

1. Schedule - The ENGINEER will establish the meeting place, time and date, notify participants and administer the meeting. CONTRACTOR shall notify major subcontractors and suppliers, as appropriate.
2. Attendance
  - a. ENGINEER and/or resident project representative.
  - b. CONTRACTOR's project manager and project superintendent
  - c. OWNER's representative
  - d. Subcontractor, as appropriate to the agenda
  - e. Suppliers, as appropriate to the agenda
  - f. Other parties as determined by ENGINEER and/or OWNER
3. Agenda
  - a. Review minutes of previous meeting.
  - b. Review of work progress since previous meeting.
  - c. Review field observations, problems, conflicts.
  - d. Review problems which impede construction schedules.
  - f. Review of off-site fabrication, delivery schedules.
  - g. Review corrective measures and procedures to regain projected schedule.
  - h. Review revisions to construction schedules.

- i. Review plan progress, schedule, during succeeding work period.
  - j. Review coordination of schedules.
  - k. Review submittal schedules; expedite as required.
  - l. Review maintenance of quality standards.
  - m. Review proposed changes for:
    - effect on construction schedule and on completion date
    - effect on other contracts of the project
  - n. Other business
4. Minutes - ENGINEER will prepare and distribute copies to participants and OWNER for review at the next meeting.

\*\*\* END OF SECTION \*\*\*

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## SECTION 01075

### PRICE AND PAYMENT PROCEDURES

#### **PART 1 - GENERAL**

##### 1.1 SECTION INCLUDES

- A. Applications for payment.
- B. Change procedures.
- C. Defect assessment.
- D. Unit prices.
- E. Alternates.
- F. Explanation of Bid Items

##### 1.2 APPLICATIONS FOR PAYMENT

- A. Submit updated construction schedule with each Application for Payment.
- B. Payment Period: Submit at one month intervals, including work completed through the end of the month.
- C. Substantiating Data: When ENGINEER requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
  - 1. Partial release of liens from major subcontractors and vendors.
  - 2. Construction progress schedules, revised and current.
  - 3. Estimate of future value of work completed, with projected total value of work completed by the end of each month through the end of the project.

##### 1.3 CHANGE PROCEDURES

- A. Maintain detailed records of work done on a Cost of Work basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
- C. On request, provide additional data to support computations:
  - 1. Quantities of products, labor, and equipment.

2. Taxes, insurance and bonds.
  3. Overhead and profit.
  4. Justification for any change in Contract Time.
  5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a Cost of Work basis, with additional information:
1. Origin and date of claim.
  2. Dates and times work was performed, and by whom.
  3. Time records and wage rates paid.
  4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
- E. The ENGINEER will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on a Field Order.
- F. The ENGINEER may issue a Proposal Request including a detailed description of proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change. CONTRACTOR will prepare and submit estimate within 10 days.
- G. CONTRACTOR may propose changes by submitting a request for change to ENGINEER, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors.
- H. Stipulated Sum/Price Change Order: Based on Proposal Request and CONTRACTOR'S fixed price quotation or CONTRACTOR'S request for Change Order as approved by ENGINEER.
- I. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- J. Work Directive Change: ENGINEER may issue directive, shown in Exhibit E as Work Directive Change and signed by OWNER, instructing CONTRACTOR to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.
- K. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions

of the Contract. ENGINEER will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

- L. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- M. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation.
- N. Change Order Forms: Exhibit F
- O. Execution of Change Orders: ENGINEER will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
- P. Correlation of CONTRACTOR Submittals:
  - 1. Promptly revise Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
  - 2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
  - 3. Promptly enter changes in Project Record Documents.

#### 1.4 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements in accordance with article 13 of the General Conditions.
- B. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable.
  - 2. Products determined as unacceptable before or after placement.
  - 3. Products not completely unloaded from transporting vehicle.
  - 4. Products placed beyond lines and levels of required Work.
  - 5. Products remaining on hand after completion of the Work.
  - 6. Loading, hauling, and disposing of rejected products.

#### 1.5 UNIT PRICES

- A. Authority: Measurement methods are delineated in individual specification sections.
- B. Measurement methods delineated in individual specification sections complement criteria of this section. In event of conflict, requirements of individual specification section govern.

- C. Take measurements and compute quantities. ENGINEER will verify measurements and quantities.
- D. Unit Quantities: Quantities and measurements indicated in Bid Form are for contract purposes only. Quantities and measurements supplied or placed in the Work shall determine payment. Actual quantities provided shall determine payment.
  - 1. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at unit sum/prices contracted.
  - 2. When actual Work requires 25 percent or greater change in quantity than those quantities indicated, OWNER or CONTRACTOR may claim for Contract Price adjustment.
- E. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application or installation of item of the Work; overhead and profit.
- F. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by ENGINEER multiplied by unit sum/price for Work incorporated in or made necessary by the Work.
- G. All work specified in DIVISION 1 – GENERAL REQUIREMENTS shall be considered incidental to and included in the appropriate Unit Prices stated in the Bid Form.
- H. Measurement Of Quantities:
  - 1. Weigh Scales: Inspected, tested and certified by applicable state Weights and Measures department within past year.
  - 2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
  - 3. Metering Devices: Inspected, tested and certified by applicable State department within past year.
  - 4. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
  - 5. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
  - 6. Measurement by Area: Measured by square dimension using mean length and width or radius.
  - 7. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.



8. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

## 1.6 ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at OWNER'S option in accordance with article 9 of Instructions to Bidders. Accepted Alternates will be identified in OWNER-CONTRACTOR Agreement.
- B. Coordinate related work and modify surrounding work.

## 1.7 EXPLANATION OF BID ITEMS

It is the purpose and intent of these Specifications to describe the minimum requirements for the Project. All items not specifically mentioned which are required to complete the work shall be included in the total overall lump sum price bid. Services performed, and materials used, shall conform in quality of material and workmanship to current industry standards, the Technical Plans and Specifications, California American Water Standard Details and the City of Bellflower requirements.

The unit price bid per unit measure of work shall include all costs of labor, equipment, and materials necessary for the furnishing and constructing, complete in place and operating in accordance with the Plans and Specifications, for all work listed in the bid items.

### **Bid Item No. 1 – General Conditions & Mobilization**

This bid item shall be bid lump sum for General Conditions & Mobilization and shall conform to the provisions of Section 9-1.16D of the State Standard Specifications, California Public Contract Code 10104, and these Specifications.

This item shall include, but not be limited to covering the Contractor's cost for processing the contract documents and for moving the personnel, equipment, supplies, materials, and incidentals to the project site as many times and in the proper sequence to complete the work as shown and as required on the Project Plans and as directed by the Engineer.

This item shall also include all preparatory work and operations required for the establishment of all facilities necessary for work on the Project, the pre-construction video in accordance with Section 01300 "Submittals" of these Specifications, and for all other work and operations which must be performed, or costs incurred prior to beginning the work on the various contract items on the Project site.

### **Bid Item No. 2 – City of Bellflower ROW Permits**

This item shall be bid lump sum for City of Bellflower ROW Permits and shall conform to the provisions of these Specifications, and as directed by the Engineer.

This bid item shall consist of the payment of fees to the City of Bellflower for obtaining a permit for street and public right-of-way construction.

The dollar amount listed on the Bid Form is an allowance and will be included in each bidder's Bid Proposal. The allowance amount is an estimated fee total, and the actual fee total, determined by the City, is subject to change.

### **Bid Item No. 3 – Contract Bonds**

This item shall be bid lump sum for Contract Bonds and shall conform to the provisions of the Agreement, these Specifications, and as directed by the Owner.

This bid item shall consist of all bonds required by the Contract, conforming to the specifications in Article 5 of the General Conditions.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Contract Bonds shall be included in the lump sum bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 4 – Traffic Control, Detours & Access**

This bid item shall be bid lump sum for Traffic Control, Detours & Access and shall conform to the provisions of Section 01570, "Traffic Regulation," of the Technical Specifications, Caltrans Standard Specifications latest edition, the California Manual on Uniform Traffic Control Devices (MUTCD) latest edition, and Work Area Traffic Control Handbook (WATCH) latest edition, as shown on the Project Plans and as directed by the Engineer.

This item shall consist of the Contractor's responsibility to provide safety and convenience to the public in connection with the Contractor's operations. The Contractor shall be responsible for preparing and providing a Traffic Control Plan prior to starting work, obtaining City approval, and for furnishing, placing, maintaining, repairing, replacing, and removing barricades, detours, traffic handling equipment and devices, signs, lights, flares, and other affected facilities.

This item shall include, but not be limited to: constructing, maintaining and removing temporary paved detours; establishing, maintaining and discontinuing temporary alternate route detours; providing and maintaining traffic control; providing access to properties in the vicinity of the work; preparing and securing the Engineer's approval of the traffic control plans; providing flaggers as necessary; furnishing, installing, maintaining and removing aggregate base and asphalt concrete for construction of optional detours not shown on the plans; traffic control signs and devices; pavement markings; channelizers; and providing for the convenience and safety of the public and public traffic, as shown on the Project Plans, in conformance with the provisions in the Specifications, in conformance with the provisions of all required permits, as approved by the City, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Traffic Control, Detours & Access shall be included in the lump sum bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 5 – Dust Control**

This bid item shall be bid lump sum for Dust Control and shall conform to the provisions of Section 01410, “Work Restrictions,” and Section 02540, “Erosion and Sediment Control,” of the Technical Specifications, all regulatory agency requirements and permits, as shown on the Project Plans and as directed by the Engineer.

This item shall include, but not be limited to: soil stabilization, carryout and track out prevention, notification, installing, inspecting, maintaining, required record keeping, and removing control measures to reduce Visible Dust Emissions (VDE) and eliminate dust nuisances from and within the construction site, including implementation of the dust control plan if appropriate, as shown on the Project Plans, in conformance with the provisions in the Specifications, and as directed by the Engineer.

Dust control measures shall be fully and adequately carried out on weekdays, nights, weekends and holidays, and when necessary, before or after normal working hours. The Contractor shall comply with all requirements of the Fugitive Dust Control Rules 403 under section 3.2 the South Coast Air Quality Management District (SCAQMD), and shall prepare and submit a dust control plan for approval.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Dust Control shall be included in the lump sum bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 6 – Clearing, Grubbing & Demolition**

This bid item shall be bid lump sum for Clearing, Grubbing & Demolition and shall conform to the provisions of these Specifications, as shown on the Project Plans and as directed by the Engineer.

This item shall consist of, but not be limited to, the removal, storage, and lawful disposal of all roots, stumps, limbs, buried logs, concrete, aggregate base, concrete asphalt, existing chain link fence, posts, and post foundations, existing turf, buried trash, trash piles, vegetation to be removed, temporary detour improvements, and all other objectionable material which is encountered during the excavations for, and the installation of, the proposed improvements, and the protection of all adjacent improvements, trees, and plants, as shown on the Project Plans, in conformance with the provisions in the Specifications, and as directed by the Engineer. This item also includes all saw cutting operations to remove existing pavement or concrete surfacing.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Clearing, Grubbing & Demolition shall be included in the lump sum bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 7 – Implementation of Stormwater BMPs**

This item shall be bid lump sum for Implementation for Storm Water (BMPs) and shall conform to the provisions of these Specifications, as shown on the Project Plans and as directed by the Engineer.

The lump sum price paid for Implementation of Storm Water (BMPs) shall consist of complying with all of the requirements of the latest National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities and the requirements of the SCAQMD in the preparation of and obtaining approval, revising and amending the plans, in conformance with these Specifications, as shown on the Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Implementation for Storm Water (BMPs) shall be included in the lump sum bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 8 – 8” DIP Class 350 WM and Fittings, Trenching Complete**

This bid item shall be bid per linear foot for 8” DIP Class 350 WM and Fittings, Trenching Complete and shall conform to the provisions of Section 15065, “Ductile Iron Pipe and Fittings”, of the Technical Specifications, and shall be furnished and installed in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall consist of furnishing all materials and constructing 8-inch DIP potable water mains.

This item shall include, but not be limited to: construction staking; excavation, spoils removal, subgrade preparation, pipe bedding, backfill, compaction; worker protection from the hazard of caving ground, concrete removal and replacement; furnishing and installing fittings, bends, restrained joints, field closures, gaskets, gasket lubricant, polyethylene encasement, tracer wire, and warning tape; and compaction testing of pipe backfill and subgrade, and pipe bedding, in conformance with the provisions in the Specifications, as shown on the Project Plans, and as directed by the Engineer.

This item shall also include removing and replacing existing signs, mail boxes, curbs, gutters, and sidewalks as necessary for the construction of the Project or because of collateral unintended damage, and locating, protecting and supporting existing utilities and utility poles adjacent to the work.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing 8” DIP Class 350 WM and Fittings, Trenching Complete and in place, including backfill and compaction, shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

The final pay quantity will be based upon the actual quantity installed, as determined by the Engineer.

**Bid Item No. 9 – 8” Gate Valve, Valve Box & Cover**

These bid items shall be bid per each for 8” Gate Valve, Valve Box & Cover, and shall conform to the provisions of Section 15150, “Gate Valves,” of the Technical Specifications, and shall be furnished and installed in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall include, but not be limited to: excavation, spoils removal, pouring valve foundations/anchors, backfill, compaction, and compaction testing of subgrade and backfill; furnishing and installing gate valves, valve actuators, valve box and cover, concrete collar, valve stem extension, PVC casing; and setting valve boxes and covers to finished grade, in conformance with the provisions in the Specifications, as shown on the Project Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing 8” Gate Valve, Valve Box & Cover complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

The final pay quantity will be based upon the actual quantity installed, as determined by the Engineer.

**Bid Item No. 10 – 6” Gate Valve, Valve Box & Cover**

These bid items shall be bid per each for 6” Gate Valve, Valve Box & Cover, and shall conform to the provisions of Section 15150, “Gate Valves,” of the Technical Specifications, and shall be furnished and installed in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall include, but not be limited to: excavation, spoils removal, pouring valve foundations/anchors, backfill, compaction, and compaction testing of subgrade and backfill; furnishing and installing gate valves, valve actuators, valve box and cover, concrete collar, valve stem extension, PVC casing; and setting valve boxes and covers to finished grade, in conformance with the provisions in the Specifications, as shown on the Project Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing 6” Gate Valve, Valve Box & Cover complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

The final pay quantity will be based upon the actual quantity installed, as determined by the Engineer.

### **Bid Item No. 11 – 4” Gate Valve, Valve Box & Cover**

These bid items shall be bid per each for 4” Gate Valve, Valve Box & Cover, and shall conform to the provisions of Section 15150, “Gate Valves,” of the Technical Specifications, and shall be furnished and installed in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall include, but not be limited to: excavation, spoils removal, pouring valve foundations/anchors, backfill, compaction, and compaction testing of subgrade and backfill; furnishing and installing gate valves, valve actuators, valve box and cover, concrete collar, valve stem extension, PVC casing; and setting valve boxes and covers to finished grade, in conformance with the provisions in the Specifications, as shown on the Project Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing 4” Gate Valve, Valve Box & Cover complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

The final pay quantity will be based upon the actual quantity installed, as determined by the Engineer.

### **Bid Item No. 12 – 1” Water Service**

This item shall be bid per each for 1” Water Services and shall conform to the provisions of Section 15000, “Pipelines - General Provisions”, California American Water Standard Drawings COR-1 and COR-2, these Specifications, as shown on the Plans and as directed by the Engineer.

This bid item shall consist of furnishing and installing 1” water services complete and in place, including, but not limited to, trenchless excavation, open cut excavation, all pipe, fittings, pit resurfacing, testing and chlorination. The installation of the water services may be bored or open cut.

The Contractor shall install the water services per California American Water Standard Drawings COR-1 and COR-2 to the meter boxes. Contractor shall remove existing meter boxes and install new meter boxes, and transfer existing meter to new meter box. Contractor shall disconnect, cut, and cap existing water services, and connect new water services to meter. On-site water service shall be connected to new meter box. Water meter boxes shall be Armorcast A6000485SA Polyconcrete Water Meter Box, with A6000484DQ Box Cover and A6000487T Drop-In Lid, or approved equal.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item.

Full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all work involved in installing 1" Water Services, complete in place, shall be included in this bid item, and no additional payment will be made.

The final pay quantity will be based upon actual quantity installed, as determined by the Engineer.

### **Bid Item No. 13 – Fire Hydrant**

This item shall be bid per each for Fire Hydrant and shall conform to the provisions of Section 15181, "Fire Hydrants," of the Technical Specifications, as shown on the Project Plans and as directed by the Engineer.

This bid item shall consist of, but not limited to, furnishing and installing all pipes, valves, bends, fittings, thrust restraints, and fire hydrants, complete with buried appurtenances. Chlorination, flushing, pressure testing, trenching, blocking, backfilling and compaction shall also be included in the unit price of this item. In addition, any landscape and irrigation repairs or replacement necessary shall be included in this bid item.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing Fire Hydrant, complete in place, shall be included in this bid item, and no additional payment will be made.

The final pay quantity will be based upon actual quantity installed, as determined by the Engineer.

### **Bid Item No. 14 – Connection to Existing Main**

This bid item shall be bid per each for Tie-In Connections and shall conform to the provisions of Section 15065, "Ductile Iron Pipe and Fittings" and Section 15000 "Pipelines and General Provisions", of the Technical Specifications, and shall be completed in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

The connections to existing mains shall be completed at the locations shown on the Project Plans:

- Both ends of Glandon St
- Both ends of Cloverwood St
- Maplewood St near Blaine Ave
- Blaine Ave near Glandon St
- Intersection of Somerset Blvd and Bellflower Blvd

This work shall include, but not be limited to: excavation, spoils removal, backfill, compaction, and compaction testing; furnishing and installing a tee fitting, any necessary reducers, coupling, a service saddle or restrained flanged coupling adapter, connecting the new main to the existing main, and resurfacing the trench, in



conformance with the provisions in the Specifications, as shown on the details of the Project Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in completing Tie-In Connections complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

The final pay quantity will be based upon the actual quantity installed, as determined by the Engineer.

### **Bid Item No. 15 – Trench Resurfacing**

This item shall be bid per linear foot for Trench Resurfacing and shall conform to applicable provisions of California American Water Standard Drawing COR-23, per City requirements, these Specifications, as described on Sheet 2 of the Project Plans and as directed by the Engineer.

Pavement saw cutting and grinding, and trench resurfacing shall be included in this bid item. Striping and markings shall be included in this bid item for all areas disturbed by construction activities.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Trench & Pavement Restoration, shall be included in this bid item.

### **Bid Item No. 16 – Install Tack Welded Temporary Trench Steel Plates as Needed Per City**

This item shall be bid per lump sum for Tack Welded Temporary Trench Steel Plates and shall conform to the provisions of Section 01500 “Temporary Facilities,” of the Technical Specifications, City Standards, these Specifications, as shown on the Plans and as directed by the Engineer.

This bid item shall consist of furnishing and installing tack welded temporary trench steel plates complete, including, but not limited to, non-skid H-20 traffic-rated steel plates, tack welding, cold mix asphalt patch, and removal of temporary steel plates before permanent resurfacing.

Full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all work involved in installing Tack Welded Temporary Trench Steel Plates, complete in place, shall be included in this bid item, and no additional payment will be made.

### **Bid Item No. 17 – Removal of Pipe, Valves & Ancillary Items**

This bid item shall be bid lump sum for Removal of Pipe, Valves & Ancillary Items and shall conform to the provisions of these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall include, but not limited to removing all pipe, valves, services, and appurtenances as necessary to construct new improvements shown on the Project Plans, in conformance with the Specifications, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Removal of Pipe, Valves & Ancillary Items complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

### **Bid Item No. 18 – Curb, Gutter, and Sidewalk Restoration**

This item shall be bid per lump sum for Curb, Gutter, and Sidewalk Restoration and shall conform to applicable provisions of California American Water Standard Drawings COR-18, COR-23, per City requirements, these Specifications and as directed by the Engineer.

Pavement saw cutting and grinding, and trench resurfacing shall be included in this bid item. Striping and markings shall be included in this bid item for all areas disturbed by construction activities.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in Curb, Gutter, and Sidewalk Restoration, shall be included in this bid item.

### **Bid Item No. 19 – Disinfecting, Flushing and Testing Pipelines**

This bid item shall be bid lump sum for Disinfecting, Flushing and Testing Pipelines and shall conform to the Provisions of Section 15020, “Disinfecting Water Mains” and 15030, “Pressure and Leakage Tests”, of the Technical Specifications, per City requirements, as shown on the Plans and as directed by the Engineer.

This work shall include, but not be limited to: disinfection via chlorination, filling and flushing water mains, de-chlorination, disposal of de-chlorinated water, hydrostatic testing, and acquisition of all necessary permits, in conformance with the provisions in the Specifications, as shown on the details of the Project Plans, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Disinfecting, Flushing and Testing Pipelines shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

**Bid Item No. 20 – Geotechnical Testing Services by Independent Laboratory Selected By CAW**

This item shall be bid per lump sum for Geotechnical Testing Services by Independent Laboratory Selected By CAW and shall conform to the provisions of these Specifications, and as directed by the Engineer.

This bid item shall consist of the procurement of geotechnical testing services by an independent testing laboratory. The testing laboratory will be selected by California American Water.

The dollar amount listed on the Bid Form is an allowance and will be included in each bidder's Bid Proposal.

**Bid Item No. 21 – Miscellaneous Facilities and Operations**

This bid item shall be bid lump sum for Miscellaneous Facilities and Operations and shall conform to the provisions of Section 01000, "Summary of Work," of the Technical Specifications, and shall be in conformance with these Specifications, as shown on the Project Plans, and as directed by the Engineer.

This work shall include, but not be limited to providing all miscellaneous facilities and operations required for work shown on the Plans or specified in the Specifications, or patently necessary for the completion of work so shown or specified, and not specifically included in the work under any other bid item, in conformance with the provisions in the Specifications, as shown on the Project Plans, and as directed by the Construction Manager.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in completing Miscellaneous Facilities and Operations complete and in place shall be included in the unit price bid amount for this bid item and no additional payment shall be made.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

\*\*\* END OF SECTION \*\*\*

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## SECTION 01300

### SUBMITTALS

#### **PART 1 - GENERAL**

##### 1.01 BEFORE STARTING WORK

###### A. Preliminary Progress Schedule

In accordance with Section 2.05 of the General Conditions, the CONTRACTOR shall prepare and submit to the ENGINEER for approval, a preliminary construction progress schedule. This submittal is to be made within ten (10) days from the effective date of Agreement.

The work day to calendar date correlation of the construction schedule shall be based on a 40-hour work week with adequate allowance for holidays, adverse weather and all other special requirements of the work.

The schedule shall include, as a minimum, the following separate activities:

1. Physical construction (includes mobilization, demobilization, setup time, lags, etc.).
2. Issuance by CONTRACTOR of purchase orders for material and equipment and submittal of shop drawings and samples to the ENGINEER.
3. Review by ENGINEER for each submittal of samples and shop drawings. Unless otherwise approved by the ENGINEER, allow a minimum of fifteen (15) working days for ENGINEER to review each submittal.
4. Fabrication time for materials and equipment.
5. Delivery of materials and equipment.
6. Installation of materials and equipment.
7. Testing, start-up and training for individual pieces of equipment or entire systems as appropriate.
8. Winter affected activities.

9. Outages or interruptions of OWNER's facilities required to perform work.
10. Demolition or removal work under this Contract.

Activity durations shall represent the best estimate of elapsed time considering the scope of the Work involved in the activity and the resources planned for accomplishing the activity expressed in working days.

Activity descriptions shall clearly define the scope of work associated with each activity. If activity descriptions contained in the schedule are not sufficient to describe the work, a supplemental narrative description is to be provided.

The construction work shall be detailed to an extent that progress can be readily monitored on a daily basis. In general, the construction work shall be detailed such that no construction activity shall have a duration greater than fifteen (15) work days.

Each activity shall be coded by the CONTRACTOR as necessary for proper and efficient utilization of the schedule. As a minimum, each activity shall be coded by:

1. Activity type (ie., submittal, ENGINEER's review, delivery, construction, etc.).
2. Responsibility (ie., CONTRACTOR, subcontractor A, subcontractor B, OWNER, ENGINEER, etc.).
3. Area (ie., Building A, Building B, sitework, etc.).
4. Work order (ie., OWNER assigned number required for monthly invoicing requirements).

The above schedule development requirements are a minimum and the CONTRACTOR shall develop the schedule as necessary to properly control and manage the project.

The preliminary progress schedule shall be submitted in a graphic representation of all significant activities and events involved in the construction of the project, and a written statement explanatory thereof for a complete understanding of the diagram.

The schedule reports shall be bound in booklet form and tabbed.

B. Shop Drawings and Samples Submittal Schedule

The preliminary progress schedule shall contain activities in the network representing submittal and review of shop drawings and material samples.

C. Schedule of Values

In accordance with Section 2.05 of the General Conditions the CONTRACTOR shall submit to the ENGINEER a schedule of values representing a detailed subdivision of the lump sum Contract amount. This subdivision, when approved by the ENGINEER, will become the basis for computing the contractors monthly progress payments. If practical, the schedule of values shall be developed by assigning a cost value to the appropriate activities contained in the preliminary progress schedule. If activities, or other line items, in the schedule of values contain costs associated with material, labor or subcontracts these costs are to be identified separately by listing the activity multiple times and identifying material, labor and subcontract with a suffix M, L and S respectively. Cost values for activities representing materials/equipment only shall be assigned to the activity representing delivery of such material/equipment to the job site.

D. Cash Flow Schedule

Accompanying the Schedule required above, the CONTRACTOR shall also submit to the ENGINEER, for approval, a Cash Flow Schedule. The Cash Flow Schedule shall show the amounts of money by months which will be required to reimburse the CONTRACTOR for Work performed during each month of the Contract Times. The sum of all the monthly cash requirements shall equal the Contract Price.

The approved Cash Flow Schedule will be used by the OWNER to program funds for progress payments to the CONTRACTOR. Monthly payments will be made to the CONTRACTOR in accordance with the Contract Agreement, but at no time will the aggregate amount of payments exceed the accumulated amount of payments for the same period of the approved Cash Flow Schedule.

E. Preconstruction Video Taping

Prior to mobilization at the site, furnish to the Engineer a CD or DVD recording of all planned construction areas, material storage areas, areas adjacent to these areas, including but not limited to, streets, driveways, sidewalks, curbs, ditches, fencing, railing, visible utilities, retaining structures and adjacent building structures. The purpose of the recording is to document existing conditions and to provide a fair measure of

required restoration. Care should be taken to record all existing conditions which exhibit deterioration, imperfections, structural failures or situations that would be considered substandard.

The recording shall be performed by a professional firm specializing in audio-video work. The tapes shall be high quality, color and in a digital format. Temporary lighting shall be provided as necessary to properly tape areas where natural lighting is insufficient (indoors, shadows, etc.). The recording shall include an audio soundtrack to provide the following information:

- detailed description of location being viewed referenced to Contract Drawings (ie. station no., building designation, pipeline route etc.)

- direction (N, S, E, W, looking up, looking down, etc.) of camera view

- date, time, temperature, environmental conditions at time of taping.

Any areas not readily visible by the recording shall be described in detail. Unless otherwise approved by Engineer, recording shall not be performed during inclement weather or when the ground is covered partially or totally with snow, ice, leaves, etc.

Prepare and provide as many CD/DVD as are necessary to satisfy the requirements of this section. The original recording shall be submitted to the Engineer accompanied by a detailed log of the contents of each CD/DVD. The recording will be maintained by the Engineer during construction and may be viewed at any time upon request. Upon final acceptance, the recording will become the permanent property of the Owner.

## 1.02 FINALIZING SCHEDULES

The CONTRACTOR shall be prepared to present and discuss at the preconstruction meeting, the schedules submitted in accordance with this specification. Unless additional information is required to be submitted by the CONTRACTOR, the ENGINEER will, within 15 working days of the preconstruction conference, provide comments to the CONTRACTOR. The CONTRACTOR shall then resubmit the affected schedules addressing the ENGINEER's comments.

Approval of the final schedules by the ENGINEER is advisory only and shall not relieve the CONTRACTOR of responsibility for accomplishing the work within the Contract Times. Omissions and errors in the approved schedule shall not



excuse performance less than that required by the Contract. Approval by the ENGINEER in no way makes the ENGINEER an insurer of the success of those schedules or liable for time or cost overruns flowing from shortcomings in such schedules.

### 1.03 REQUIREMENTS FOR CONFORMING WITH SCHEDULE

If, in the opinion of the ENGINEER, the CONTRACTOR falls behind the progress schedule, the CONTRACTOR shall take such steps as will be necessary to improve his progress, and ENGINEER may require CONTRACTOR to increase the number of shifts and/or overtime operations, days of work, and/or the amount of construction planned, and to submit for approval such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the OWNER. An updated cash flow schedule will be required in this occurrence and will be provided with the supplementary schedules referenced above.

### 1.04 UPDATING SCHEDULES

The CONTRACTOR shall submit to the ENGINEER quarterly updates of the schedules required per this specification section.

Progress and shop drawing schedule updates shall reflect the progress to date by providing actual start dates for activities started, actual finish dates for completed activities, and identifying out of sequence work, schedule logic changes and any circumstances or events impacting the current schedule. The updates shall also contain the CONTRACTOR's best estimate of the remaining duration for activities not complete as of the date of the update. All graphic presentations, reports and computer discs required per the initial submittal of these schedules shall be provided with each update.

The schedule of values and cash flow schedules shall be updated to reflect any changes.

### 1.05 ADJUSTMENT OF PROGRESS SCHEDULE AND CONTRACT TIMES

- A. If the CONTRACTOR desires to make changes in his method of operating which affect the approved progress schedule, he shall notify the ENGINEER in writing stating what changes are proposed and the reason for the change. If the ENGINEER approves these changes, the CONTRACTOR shall revise and submit for approval, without additional cost to the OWNER, all of the affected portions of the schedule.
- B. Shop drawings and samples which are not approved on the first submittal or within the schedule time shall be immediately rescheduled, as well as any work which fails to pass specified tests or has been rejected.

- C. The Contract Times will be adjusted only for causes specified in the General Conditions. In the event the CONTRACTOR requests an adjustment of the Contract times, he shall furnish such justification and supporting evidence as the ENGINEER may deem necessary for a determination as to whether the CONTRACTOR is entitled to an adjustment of Contract Times under the provisions of the General Conditions. The ENGINEER will, after receipt of such justification and supporting evidence, make findings of fact and will advise the CONTRACTOR in writing thereof. If the ENGINEER finds that the CONTRACTOR is entitled to any adjustment of the Contract Times the ENGINEER's determination as to the total number of days adjustment shall be based upon the currently approved progress schedule and on all data relevant to the adjustment. The CONTRACTOR acknowledges and agrees that actual delays in activities which, according to the progress schedule, do not affect the Contract completion date shown by the critical path in the network will not be the basis for an adjustment of Contract Times.
- D. From time to time it may be necessary for the progress schedule and/or Contract Times to be adjusted by the OWNER to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the OWNER, and other unforeseeable conditions which may indicate schedule and/or Contract Times adjustments. Under such conditions, the ENGINEER shall direct the CONTRACTOR to reschedule the work and/or Contract Time to reflect the changed conditions, and the CONTRACTOR shall revise his schedule accordingly. No additional compensation shall be made to the CONTRACTOR for such changes except as provided in the General Conditions. Unless otherwise directed, the CONTRACTOR shall take all possible actions to minimize any extension to the Contract Times and any additional cost to the OWNER.

#### 1.06 SHOP DRAWINGS

The CONTRACTOR shall promptly supply to the ENGINEER for approval, shop drawings with details and schedules for all items contained in the list of required Shop Drawings included at the end of this Section, or for other items as may be required by the ENGINEER.

A sufficient number of copies to allow the OWNER to retain four (4) reviewed copies of all drawings, schedules and brochures shall be submitted for approval. Black line prints, blue line prints or reproducible transparencies are required. Blueprints (white lines on a blue background) are not acceptable. Each submittal shall have the job name on it and the appropriate specification section or contract drawing reference.

Shop drawings shall be numbered with the WATER COMPANY's file number I15-500066-\_\_ Rev. \_\_\_\_\_. Detailed procedures for numbering will be outlined at the pre-construction meeting.

Each copy of the submittals made to the WATER COMPANY for approval shall be prepared by the CONTRACTOR and shall have an identifying title stamp as follows:

California -American Water Company  
Los Angeles County District  
**Bellflower Water Main Replacement Project – System 4**  
Shop Drawing **No. I15-500066-\_\_ Rev. \_\_\_\_\_**

As required by the General Conditions, each copy of the submittals shall also be stamped with the CONTRACTOR's approval indicating that the shop drawing has been reviewed for conformance to the Contract Documents and has been coordinated with all other work and/or trades. The CONTRACTOR shall identify and bring to the attention of the ENGINEER any deviations to the Contract Documents contained in the submittal. For shop drawings being resubmitted the CONTRACTOR shall identify and bring to the attention of the ENGINEER any revisions other than those originally requested by the ENGINEER.

Submittals smaller than 8½x11 inches shall be secured to paper 8½x11 inches.

Submittals will be returned, stamped with the following classifications:

- a) "No Exceptions Taken" - There are no notations or comments on the submittal and, in our opinion, the submittal meets the requirements of the Contract Documents and the CONTRACTOR may release the equipment for production.
- b) "No Exceptions Except as Noted - Notations have been made on the submittals to insure conformance with the Contract Documents. The CONTRACTOR may release the equipment for production in accordance with the notations.
- c) "Rejected – See Remarks" - The submittal does not meet the requirements of the Contract Documents. The CONTRACTOR must submit the specified product.
- d) "Amend as Noted and Resubmit" - When the material submitted is incorrect or insufficient to review properly and it is necessary to see the complete package again.
- e) "Resubmit Record Copy" - Used with the review action "Approved As Noted". The resubmittal shall incorporate notations.

Where a submittal indicates a departure from the Contract which the ENGINEER deems to be a minor adjustment in the interest of the OWNER not involving a change in Contract Price or extension of Contract Times, the ENGINEER may approve the submittal, but the approval will contain, in substance, the following notation:

"The modification indicated on the attached submittal is approved in the interest of the OWNER to effect an improvement for the Project and is accepted with the understanding that it does not involve any change in the Contract Price or Times; that it is subject generally to all Contract stipulations and covenants; and that it is without prejudice to any and all rights of the OWNER under the Contract Bonds."

It is emphasized that the ENGINEER's approval of CONTRACTOR's submitted data is for general conformance to the Contract Drawings and Specifications, but subject to the detailed requirements of Drawings and Specifications. Although the ENGINEER may check submitted data in more or less detail, such checking is an effort to discover errors and omissions in CONTRACTOR's drawings and to assist the CONTRACTOR in coordinating and expediting his work, and shall in no way relieve the CONTRACTOR of his responsibility to engineer the details of the Work in such manner that the purpose and intent of the Contract will be achieved, nor shall such detail check by the ENGINEER be construed as placing on the ENGINEER, any responsibility for the accuracy, and for proper fit, functioning and performance of any phase of the Work included under this Contract.

## 1.07 SAMPLES

When required by the ENGINEER or where noted in other Sections of these Specifications, samples or materials shall be submitted for approval.

Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

Submit samples of finishes from the full range of manufacturer's standard colors, textures, and patterns for ENGINEER's selection.

Include identification on each sample, with full project information.

Submit the number or samples specified in individual specification sections; one of which will be retained by ENGINEER.

Reviewed samples which may be used in the Work are indicated in individual specification sections.

#### 1.08 PROGRESS PAYMENTS

The detailed arrangement for submittal of progress payments shall be discussed at the preconstruction meeting. In general, progress payments shall be submitted monthly in a format acceptable to the ENGINEER. The progress payment request shall be based on the approved schedule of values and should provide the percentage of completion, total dollar value completed, dollar value completed prior to the current payment, and the amount requested for this progress payment for each line item contained in the schedule of values. Progress payment requests for material and/or equipment suitably stored but not yet incorporated into the work shall be accompanied by a copy of the appropriate manufacturers invoice, shipping order, bill of lading, etc. and the progress payment amount shall be the direct cost to the CONTRACTOR, or subcontractor, for such material and/or equipment. Payment will not be made to the CONTRACTOR if, upon inspection by the ENGINEER, it is determined that the material and/or equipment does not conform to the requirements of the Contract Documents including proper storage, receipt of approved shop drawings, receipt of any special guarantees, Bonds, insurance coverage, any evidence of damage or imperfections, etc.

#### 1.09 CONTRACTOR'S DAILY REPORTS

If requested by the ENGINEER or the Resident Project Representative, the CONTRACTOR shall prepare and submit daily reports containing the following information:

1. The number of craftsmen and hours worked of each subcontractor,
2. the number of hours worked by each trade,
3. the number of hours worked of each type of equipment,
4. a description of work activities performed,
5. a description of any material or equipment deliveries,
6. description of obstructions encountered,
7. temperature and weather conditions.

The daily reports shall be submitted on a daily basis, by the end of the next business day.

Information provided on the daily report shall not constitute notice of delay or any other notice required by the Contract Documents. Notice shall be as required therein.

#### 1.10 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

Prepare complete written maintenance and operating instructions covering the equipment provided under this Contract. Divide the operating instructions into basic sections according to type of equipment.

Instructions shall describe all equipment and controls, their purpose, and their operation and use. Include maintenance checklists for use by the OWNER's personnel and a complete listing of replacement parts with pertinent information relative to ordering such parts.

Submit instructions in duplicate draft form for review by the ENGINEER at least eight weeks prior to initial operation, and in final form within thirty days after return of one copy of the draft with the ENGINEER's notations.

Prior to release of Final Payments, revise and resubmit copies of the instructions to accord with any changes in procedures or equipment made during start-up or initial operation. Resubmittals are also required for changes made during the guarantee period.

## **PART 2 - PRODUCTS**

Not Used.

## **PART 3 - EXECUTION**

Not Used.

\*\*\* END OF SECTION \*\*\*

SECTION 01410

WORK RESTRICTIONS

**PART 1 - GENERAL**

1.01 REQUIREMENT

A. The section provides work restrictions and requirements for work performed.

1.02 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Preconstruction Submittals

- a. List of Contact Personnel
- b. Personnel List

1.03 SPECIAL SCHEDULING REQUIREMENTS

A. The following conditions apply:

- 1. CONTRACTOR shall coordinate its work with the California-American Water Los Angeles County District Operations for main shut down during tie-ins, pressure testing and bacteriological testing.
- 2. CONTRACTOR shall coordinate its work with the City for all work in the Right-Of-Way.

1.04 CONTRACTOR ACCESS AND USE OF PREMISES

A. Activity Regulations

- 1. Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic security and environmental regulations and restrictions.
  - a. Keep within the limits of the work and avenues of ingress.
  - b. Wear hard hats in construction areas.
  - c. Mark Contractor equipment for identification.
- 2. Contractor shall use the minimum crew size (6 to 8) as required throughout construction.

3. Contractor shall be responsible for obtaining staging area. Contractor shall be responsible for unloading all materials.

#### B. Subcontractors and Personnel Contacts

1. Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

#### C. No Smoking Policy

1. Smoking is prohibited within and outside of all buildings within the working area of equipment, installation or testing.
  - a. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines.

#### D. Working Hours

1. Regular working hours shall consist of: 7:00am-5:00pm, excluding the following holidays:
  - a. New Year's Day, Memorial Day, 4<sup>th</sup> of July, Labor Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day.

#### E. Work Outside Regular Hours

1. Work outside regular working hours requires California-American Water Los Angeles County District Operations Manager and City approval. Notify 15 calendar days prior to such work to allow arrangements to be made by the California-American Water for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title.
2. Based on the justification provided, the Los Angeles County District Operations Manager may approve work outside regular hours.
3. During periods of darkness, the different parts of the work must be lighted in a manner approved by the ENGINEER or California-American Water Inspector.

#### F. Utility Cutovers and Interruptions

1. Make utility cutovers and interruptions during normal working hours of Mondays thru Thursdays and not the day before a holiday.



CONTRACTOR shall notify the OWNER in advance of any requests for shutdown of portions of the water system per Section 01000 – Summary of Work.

2. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
3. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air, and propane, and natural gas are considered utility cutovers.

## **PART 2 - PRODUCTS**

Not Used.

## **PART 3 - EXECUTION**

Not Used.

\*\*\* END OF SECTION \*\*\*

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## SECTION 01500

### TEMPORARY FACILITIES

#### **PART 1 - GENERAL**

##### 1.01 WATER SUPPLY

If reasonably available, water for the purpose of this Contract will be supplied to the CONTRACTOR by the OWNER. The CONTRACTOR shall furnish and install all necessary meters, certified & tested backflow preventer, temporary piping and valves in connection with such water supply.

The OWNER reserves the right to impose limitations upon the CONTRACTOR'S use of water as the OWNER, in its sole discretion, determines may be necessary to assure it of its continued ability to meet the demands of its customers and the volumes and pressures required for fire protection. Any water required by the CONTRACTOR in excess of the quantities the OWNER provides to the CONTRACTOR must be furnished by the CONTRACTOR at his own cost.

##### 1.02 TEMPORARY HEAT

If Applicable, the CONTRACTOR shall provide approved type heating apparatus with the necessary fuel in order to protect and/or dry out the work. The stored materials and finished work shall be protected at all times from damage by the weather elements.

##### 1.03 ELECTRICAL SUPPLY

The CONTRACTOR shall pay all fees, obtain necessary permits and have meter installed for power and light as may be required for the prosecution of his work.

##### 1.04 TEMPORARY LIGHTING

Provide and maintain lighting for construction operations and lighting to exterior staging and storage areas after dark for security purposes.

##### 1.05 BARRIERS

Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing buildings. Provide protection for plant life designated to remain. Replace damaged plant life.

#### 1.06 FENCING

Not Applicable

#### 1.07 PARKING

Not Applicable

#### 1.08 PROGRESS CLEANING

Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

#### 1.09 SANITARY FACILITIES

The CONTRACTOR shall provide suitable temporary facilities and enclosures for the use of workmen and shall maintain same in a sanitary condition.

The CONTRACTOR is advised that the OWNER is in the business of providing potable water and the CONTRACTOR'S sanitary arrangements shall not endanger the OWNER'S facilities.

#### 1.10 FIELD OFFICES

Not Applicable

#### 1.11 TRAFFIC RATED STEEL PLATES

The CONTRACTOR shall provide traffic rated steel plates to protect open trenches and excavations in areas where backfilling operations cannot be completed within the same day. The steel plates must be able to withstand H-20 traffic loading without any movement. The steel plates shall be tack welded. The gap between the edge of the plate and the adjacent existing asphalt pavement shall be filled with temporary asphalt patch (cold mix).

### **PART 2 - PRODUCTS**

Not Used.

### **PART 3 - EXECUTION**

Not Used.

\*\*\* END OF SECTION \*\*\*

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## **SECTION 01570**

### **TRAFFIC REGULATION**

#### **PART 1: GENERAL**

##### **1.01 SCOPE OF WORK**

- A. Furnish and install all traffic barricades, markers, signs, controls and provide flagmen, traffic police and other facilities required by the applicable Federal, State, County or local government authorities and the Engineer to protect general public and maintain the existing roads, streets and highways.
- B. Traffic control methods and materials shall conform to the latest editions of applicable State DOT Standard Specifications for Road and Bridge Construction and USDOT Manual on Uniform Traffic Control Devices for Streets and Highways.
- C. Prior to the start of construction, assign one individual at a supervisory level who will be responsible for maintenance and protection of traffic. See General Conditions article 6.
- D. Competent traffic personnel suitably attired for safety shall be employed at every location where the Contractor's equipment is working immediately adjacent to, or is entering, leaving or crossing, active traffic lanes. The traffic personnel shall be employed continuously for the full time such conditions exist.
- E. Special attention shall be given for the protection of pedestrians and, in particular, children going to and coming from school. Ingress and egress shall be maintained for all properties abutting the pipeline.
- F. Notify the State and local police, ambulance services and fire departments of daily traffic diversions.
- G. Be fully responsible to complete all obligations of the Contract regardless of any restrictions which may be imposed by Federal, State, County or local authorities. The Owner or Engineer makes no warranty or representation that the Contractor will be permitted to divert or barricade traffic.

##### **1.02 MAINTAINING TRAFFIC**

- A. Traffic Diversion: Whenever it is necessary to divert traffic from its normal channel into another channel, such diversion shall be clearly marked by cones, drums, barricades, temporary guardrail or other appropriate devices. If the markers are left in place at night, suitable lights shall be provided and maintained.
- B. Street Closing: When permitted by Federal, State or local authorities having jurisdiction, the Contractor may close streets to through traffic for minimum periods of time. Notify and secure the permission of the local police and fire departments and such other public authorities and, if required by any law,

ordinance or regulation, the occupants of all premises bordering the streets. Give all occupants reasonable notice with respect to the closing of any street, in whole or in part, even when not required by any law, ordinance, or regulation. Schedule work such that the time the street is closed is kept to a minimum and, whenever possible, make suitable preparations for access by local residents, school buses, and mail delivery vehicles. Provide access for police, fire, ambulance and emergency vehicles at all times. Fire hydrants and other public utility valves shall be kept accessible at all times.

### **1.03 TRAFFIC SIGNALS AND CONTROLS**

- A. The installation and operation of all traffic signals and traffic control devices shall conform to the requirements of Federal, State and local government highway departments. The replacement of pavement markings disturbed during construction or the installation of temporary markings is the sole responsibility of the Contractor.
- B. To protect persons from injury and to avoid property damage, adequate barricades including flasher and reflectorized construction signs and guards as required shall be placed and maintained during the progress of the construction work and until it is safe for traffic and pedestrians to use the trenched area.
- C. When permitted to close a street or road to traffic, furnish, erect, maintain and remove barricades, suitable and sufficient red lights, and other lights or reflecting material at the limits of the project, where side streets intersect, and at other points of public access to the project. Furnish, erect and maintain advance warning signs and barricades on side street at the first street intersection beyond the one closed by construction indicating "Street Closed, One Block Ahead". Furnish, erect, maintain and remove detour marking signs on temporary routes.

### **1.04 TRENCH AND STORED MATERIALS MARKINGS**

- A. Before completion of each day's work, in traveled areas, the pipe trench shall be completely backfilled and tamped, and the necessary temporary paving installed.  $\frac{3}{4}$ -inch stone will be used in sidewalk and walkway areas and blacktop in driveways. These areas are not to be left open, impassable or unsafe through the night. In the event that the pipe trench cannot be completely backfilled and tamped, temporary bridges and crossings shall be used to accommodate through traffic and the general public. The job site will be left in a neat and satisfactory condition at the end of each day. The requirements of this Section are in addition to any requirements of Federal, State or local laws, rules, regulations or ordinances or any requirements found elsewhere in the Contract Documents.
- B. Equipment and material stored on the street shall be marked at all times. At night any such material or equipment stored between the side ditches, or between lines 5 feet behind any raised curbs, shall be clearly outlined with light or other dependable warning devices that are approved by the Engineer. In addition, provide any other lights, barricades, etc., that may be needed for the protection of pedestrian traffic.

### **1.05 OTHER REQUIREMENTS**



- A. Trucks and/or trailers used as protective vehicles to protect workers or work equipment from errant vehicles on roadways with posted speed limits of 50 MPH or greater shall be equipped with Truck-Mounted Attenuators conforming to the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features".
- B. The protective truck must be positioned a sufficient distance in front of the workers or equipment being protected to allow for appropriate vehicle roll-ahead, but not so far that errant vehicles will travel around the vehicle and strike the workers/equipment. Attenuators should be in the full down-and-locked position.
- C. For stationary operations, the truck's parking brake should be set and, when possible, the front wheels turned away from the work site. Turning the front wheels should be based on specific conditions at the site such that the after-impact trajectory is into a safe area.
- D. If the regulation of traffic and controls are not being provided in accordance with this Section 1570, and the public is inconvenienced or its safety is being endangered, in the judgment of the Engineer, the Owner may take such steps as it deems advisable to provide such services and all costs in providing such services will be deducted from any payment which may be due or may thereafter become due the Contractor.

**PART 2: PRODUCTS**

Not Used.

**PART 3: EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 01600

### PRODUCTS

#### **PART 1 - GENERAL**

##### **1.01 PROTECTION OF MATERIAL AND EQUIPMENT**

All electrical and mechanical equipment shall be stored in a warm, dry shelter with proper ventilation. Under no circumstances shall motors, electrical control equipment or any other electrical or mechanical equipment be stored under polyethylene plastic covers or tarpaulins. When space is available inside existing structures, and the OWNER approves, the CONTRACTOR will be allowed to store equipment inside them. Should such space not be available, the CONTRACTOR shall construct a shelter with a source of heat and proper ventilation as approved by the ENGINEER for the storage of equipment.

The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times.

After valves and hydrants have been inspected, the CONTRACTOR shall properly store them prior to use. In order to prevent entry of foreign material that could cause damage to the seating surfaces, the valves and hydrants shall be stored in a fully closed position unless recommended otherwise by the manufacturer. Resilient seated valves shall be stored in accordance with the manufacturer's recommendations. This may include storage with protective covers for rubber seats and in marginally open condition. Valves and hydrants should be stored indoors.

If valves must be stored outdoors, the CONTRACTOR shall protect the operating mechanism, such as gears, motor, actuators and cylinders, from weather elements. Valve ports and flanges must be protected from the weather and foreign materials. If valves are subject to freezing temperatures, all water must be removed from the valve interior and the valve closed tightly before storage, unless specifically recommended otherwise by the manufacturer. Valves shall be stored on pallets with the discs in a vertical position to prevent rainwater from accumulating on top of the disc, seeping into the valve body cavity and freezing and cracking the casting.

##### **1.02 SERVICING EQUIPMENT**

The CONTRACTOR shall check all equipment upon acceptance to determine if oil reservoirs are full and areas to be greased are properly packed with grease. The CONTRACTOR will provide the proper grease or oil for use in lubricating the required areas in the equipment. Any service to equipment while in storage, or

installed pending acceptance, is the responsibility of the CONTRACTOR and shall be performed per manufacturer's requirements, industry standards or as stated specifically in the technical specifications.

### 1.03 MATERIAL/EQUIPMENT FURNISHED BY OWNER

If applicable, certain material and equipment may be furnished by the OWNER as noted in the Contract Documents. The CONTRACTOR's responsibility for material and/or equipment designated to be furnished by the OWNER shall begin upon the CONTRACTOR's acceptance of such material and/or equipment at the point of delivery to him. All material and equipment shall be examined, and items found to be defective in manufacture and/or otherwise damaged shall be rejected by the CONTRACTOR at the time and place of delivery to him. The OWNER will thereupon repair or replace the damaged items.

After acceptance of material and/or equipment by CONTRACTOR at point of delivery to him, CONTRACTOR shall be responsible for the proper storage, handling, servicing and installation of such material and/or equipment in accordance with manufacturer's recommendations, industry standards or specific requirements of the Contract Documents. Any material and/or equipment found to be defective prior to acceptance by the ENGINEER shall be repaired or replaced by CONTRACTOR at no additional cost to OWNER unless CONTRACTOR submits proof that such defect was latent and could not have been detected by CONTRACTOR when performing his duties and responsibilities under these Contract Documents.

CONTRACTOR's vs. OWNER's responsibilities for providing guarantees or warranty and manufacturer's representatives for service, inspection, certification of installation, installation, field training, start-up, etc. for material and/or equipment furnished by OWNER shall be as follows unless otherwise specified: OWNER will provide the warranty and CONTRACTOR is responsible for providing manufacturer's representatives for all necessary field service, start-up service, installation certifications, installation, field training of OWNER's personnel, etc. for OWNER furnished material and/or equipment as required for acceptance of such material and/or equipment in the completed project.

## **PART 2 - PRODUCTS**

### 2.01 GENERAL

Unless otherwise specifically provided for in these Specifications, all equipment, materials and articles incorporated in the work shall be new, in current production and the best grade obtainable consistent with general construction usage.

## 2.02 COORDINATION OF DIMENSIONS

The CONTRACTOR shall verify and make necessary corrections to construction dimensions so that all specified and/or alternative equipment, which is approved by the ENGINEER, can be installed and will function within the intent of the Contract Drawings and Specifications. The CONTRACTOR will promptly notify the ENGINEER of all necessary corrections required.

## 2.03 SAFETY AND HEALTH REQUIREMENTS

All materials, equipment, fixtures and devices furnished shall comply with applicable Laws and Regulations.

All equipment furnished and installed under this Contract shall be equipped with suitable and approved safety guards and devices required for the safety of the public and operating personnel. Such guards and safety devices shall be in accord with the latest requirements of safety codes approved by the American National Standards Institute as well as the safety requirements of applicable Laws and Regulations. Where said safety codes of the ANSI are incompatible with applicable Laws and Regulations, said Laws and Regulations shall prevail.

## **PART 3 - EXECUTION**

### 3.01 INSTALLATION

Material and equipment shall be installed in accordance with the appropriate Sections of these Specifications.

### 3.02 SERVICES OF MANUFACTURER'S REPRESENTATIVE

The CONTRACTOR shall arrange for a qualified service representative from each company manufacturing or supplying certain equipment as required by the individual Specification Sections to perform the duties herein described.

After installation of the applicable equipment has been completed and the equipment is presumably ready for operation, but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but shall not be limited to, the following points as applicable:

1. soundness (without cracked or otherwise damaged parts)
2. completeness in all details, as specified
3. correctness of setting, alignment, and relative arrangement of various parts
4. adequacy and correctness of packing, sealing and lubricants

The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

On completion of his Work, the manufacturer's or supplier's representative shall submit to the ENGINEER a complete signed report of the result of his inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract Documents and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void.

After the ENGINEER has reviewed the reports from the manufacturers' representatives, the CONTRACTOR shall make arrangements to have the manufacturers' representatives present when the mechanical performance tests are made.

\*\*\* END SECTION \*\*\*

## SECTION 01650

### TESTING

#### **PART 1 - GENERAL**

##### 1.01 DESCRIPTION

This Section covers testing in accordance with the Specifications, as shown on the Drawings, and as necessary for a complete and satisfactory installation.

##### 1.02 PIPELINES

All pipelines, valves, appurtenances, etc. installed per these Contract Documents shall be tested in the manner described by the technical specifications. Unless otherwise stated, all pipelines shall be hydrostatically tested, with no leakage, at a pressure at least equal to the maximum operating pressure of the pipeline.

##### 1.03 WATER CONTAINING VESSELS

Not applicable

##### 1.04 LIQUID CHEMICAL STORAGE TANKS

Not Applicable

##### 1.05 DAMPPROOFING AND PAINTING

Not Applicable

##### 1.06 MECHANICAL PERFORMANCE TESTS

Test operation of the air/vacuum release valves in accordance with the manufacturer's recommendations.

#### **PART 2 - PRODUCTS**

Not applicable to this section.

#### **PART 3 - EXECUTION**

Not applicable to this section.

\*\*\* END OF SECTION \*\*\*

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## **SECTION 01700**

### **PROJECT CLOSEOUT**

#### **PART 1: GENERAL**

##### **1.01 TESTING OF FACILITIES**

All work shall be tested under operating conditions and pressures and any leaks or malfunctions shall be repaired to the satisfaction of the Engineer at no additional expense to the Owner.

##### **1.02 CLOSEOUT PROCEDURES**

Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection. Provide submittals to Engineer that are required by governing or other authorities. Submit Application for final payment identifying total adjusted Contract sum, previous payments, and sum remaining due.

##### **1.03 PROGRESS CLEANING AND FINAL CLEANING**

- A. Periodically, or as directed during the progress of the Work, remove and properly dispose of the resultant dirt and debris and keep the premises reasonably clear. Upon completion of the Work, remove all temporary construction facilities and unused materials provided for the Work and put the premises in a neat and clean condition and do all cleaning required by the Specifications. Trash and combustible materials shall not be allowed to accumulate in construction locations.
- B. Execute final cleaning prior to final inspection. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances. Clean equipment and fixtures to a sanitary condition. Clean debris. Clean site; sweep paved areas, rake clean landscape surfaces. Remove waste and surplus materials, rubbish, and construction facilities from the site.

##### **1.04 PROJECT RECORD DOCUMENTS**

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
  - 1. contract drawings
  - 2. specifications
  - 3. addenda
  - 4. change orders and other modifications to the Contract
  - 5. reviewed shop drawings, product data, and samples

Store record documents separate from documents used for construction. Record information concurrent with construction progress.



- B. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. manufacturer's name and product model and number
  2. product substitutions or alternates utilized
  3. changes made by addenda and modifications
- C. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured well depths, screen, casing, and pump types and dimensions in relation to finished ground elevation, if any.
  2. Measured site location of well, vault and any other structures, if any.
  3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  4. Field changes of dimension and detail.
  5. Details not on original Contract Drawings.

Submit documents to Engineer with final Application for Payment.

#### **1.05 SPARE PARTS AND MAINTENANCE MATERIALS**

- A. Contractor Purchased Material
1. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
  2. Deliver to (California American Water Company, located at 8657 Grand Avenue, Rosemead, CA 91770) as directed by Engineer; obtain receipt prior to final payment.
- B. Owner Purchased Material
1. Return excess owner material to a location(s) specified by the Engineer within three (3) days of job completion.

#### **1.06 GUARANTEES AND WARRANTIES**

- A. The Contractor expressly warrants that all workmanship and materials performed or furnished under this Contract will conform to the Specifications, Drawings, samples and other applicable descriptions furnished or adopted by the Contractor and with all applicable laws, provisions and requirements of the Contract Documents. Remedy any defects due to faulty materials or workmanship which are discovered within a period of one (1) year from the date of acceptance of the work in this project and pay for any damage resulting from faulty materials or workmanship. The Owner shall give notice of observed defects with reasonable promptness. The Contractor warranty hereunder is in addition to, and not in limitation of, any obligations found elsewhere in the

Contract Documents, any special guarantees provided by the Contractor or Contractor suppliers, and any obligations imposed by law.

- B. In addition to the above requirements, assign material and equipment guarantees and warranties from all manufacturers and suppliers to the Owner and deliver copies of such guarantees and warranties and the necessary assignments to the Owner in order to assure the Owner of the full benefit of such guarantees and warranties.

#### **1.07 RESTORATION**

- A. The Contractor shall restore and/or replace paving, curbing, sidewalks, gutters, shrubbery, fences, sod or other disturbed surfaces and structures in accordance with the Drawings and City of Bellflower requirements for work performed within the City's right-of-way. In the absence of specific direction, standards, or details, restoration and/or replacement shall be performed such that the disturbed areas are returned to a condition equal to or better than that before the work began and to the satisfaction of the ENGINEER and applicable authorities, and shall furnish all labor and materials incidental thereto.

#### **1.08 MAINTENANCE OF SURFACES**

Following the certification of completion by the Engineer, maintain the surfaces of paved and unpaved trenches and adjacent curbs and gutters, sidewalks, fencing, sod and other disturbed surfaces for a period of one (1) year thereafter or as required by state, county or local authorities unless otherwise stipulated by the Engineer. Supply all material and labor required for the maintenance of the trench surfaces and structures and perform the work in a manner satisfactory to the Engineer.

### **PART 2: PRODUCTS**

Not Used.

### **PART 3: EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 02020

### DEWATERING

#### **PART 1 - GENERAL**

##### 1.1 GENERAL

- A. The dewatering of all areas where work must be performed under this Contract is the responsibility of the CONTRACTOR and no additional sum will be allowed for any dewatering operation, overtime, equipment rental or any other expense incurred due to the occurrence of ground water, surface water or water from possible leakage of existing buildings, structures and piping in the vicinity of the CONTRACTOR'S operations.
- B. Should water be encountered, the CONTRACTOR shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is made in the dry. The CONTRACTOR shall convey all trench water to a natural drainage channel or storm sewer without causing any property damage and in strict accordance with state and/or local requirements.
- C. Disposal of silt and debris which accumulates during construction shall be performed in strict accordance with federal, state and local requirements.

##### 1.2 PERMITS

- A. The CONTRACTOR shall be responsible for obtaining and paying for any permits required for dewatering and disposal.

\*\*\* END OF SECTION \*\*\*

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## SECTION 02025

### EXISTING UTILITIES AND STRUCTURES

#### **PART 1 - GENERAL**

##### 1.1 SCOPE OF WORK

- A. General: Certain information regarding the reputed presence, size, character, and location of existing underground facilities such as pipes, drains, sewers, electrical lines, telephone lines, cable TV lines, gas lines, and water lines has been shown on the contract drawings and/or provided herein. This information with respect to underground facilities is provided by the OWNER in accordance with conditions described in paragraphs 4.3.1, 4.3.1.1, 4.3.1.2 and 4.3.2 of the General Conditions.
- B. Potholing: The CONTRACTOR shall furnish all labor, materials, tools, and equipment required to pothole all existing utilities to discover the actual location, size of existing underground utilities and improvements, and requirements to connect to existing pipelines, prior to beginning any construction of proposed facilities.

##### 1.2 NOTIFICATION OF UTILITIES

- A. **DIGALERT (UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA) shall be notified by the CONTRACTOR 48 hours prior to any construction, 811.**
- B. In addition, the CONTRACTOR shall notify the utility company contacts listed on the cover sheet of the drawings to inform each respective representative of the work under this Contract which will pass through the areas where their facilities exist.
- C. Notification to the utility representatives shall be made in a sufficient amount of time in advance (minimum 72 hours) prior to start of any potholing in the affected areas.

#### **PART 2 - PRODUCTS**

##### 2.1 GENERAL

- A. All traffic control, labor, equipment and materials required to investigate, backfill, and restore existing improvements for all potholed utilities shall be furnish by the CONTRACTOR, in accordance with utility company and agency requirements and these specifications.

- B. Materials for temporary support, adequate protection, and maintenance for all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the CONTRACTOR at his own expense.

## **PART 3 - EXECUTION**

### **3.1 POTHOLING & ALIGNMENT ADJUSTMENTS**

- A. The CONTRACTOR shall contact DigAlert to coordinate marking of the existing utilities. After DigAlert utility marking is complete, the CONTRACTOR shall employ a licensed LAND SURVEYOR, to measure and record the location, elevations, and the dimension of all underground existing utilities which cross proposed water distribution facilities. Potholing shall occur prior to any excavation and pipe installation to confirm existing utility locations.
- B. The CONTRACTOR shall depict and provide the results of the field surveys, i.e., station, offset, elevation and size for each utility crossing on the plans on a daily basis.
- C. The CONTRACTOR shall adjust the alignment of the water line as directed by the ENGINEER. No deviation shall be made from the required line or depth except with the consent of the ENGINEER.

### **3.2 REPAIRS**

- A. Existing pipes or conduits crossing the trench, or otherwise exposed, shall be adequately braced and supported to prevent trench settlement from disrupting the line or grade of the pipe or conduit, all in accordance with the directions of the ENGINEER. Utility services broken or damaged shall be repaired at once to avoid inconvenience to customers. Storm sewers shall not be interrupted overnight. Temporary arrangements, as approved by the ENGINEER, may be used until any damaged items can be permanently repaired. All items damaged or destroyed by construction and subsequently repaired must be properly maintained by the CONTRACTOR.

### **3.3 RELOCATION**

- A. Where it is necessary to relocate an existing utility or structure, the work shall be done in such a manner as is necessary to restore it to Agency's current requirements. No such relocation shall be done until approval is received from the owner of the utility or structure being changed.

### **3.4 ABANDONMENT**

- A. The ends of the existing water main to be abandoned shall be cut, sealed, and capped. Pipe shall be removed as necessary to provide working space for sealing and capping.
- B. Sealing material shall be grout, or approved equivalent.
- C. At tee connections between abandoned main and existing main to remain, contractor shall install a blind flange on the abandoned branch of the tee.
- D. In-line valves shall be abandoned-in-place, and valve can shall be filled with cement-sand slurry. Abandoned valves at tee connections shall be removed.

\*\*\* END OF SECTION \*\*\*

## SECTION 02210

### TRENCHING, BACKFILLING AND COMPACTION

#### **PART 1 - GENERAL**

##### 1.01 SUBMITTALS

- A. Trench Safety: Submit excavation protective system plans for all project trenches, a copy of the project Cal/OSHA permit under which excavations over 5 feet deep will be conducted, and the names of the competent persons assigned to supervise the project.
- B. Agreements for Disposal of Excavated Materials: Submit property owner agreements which allow the disposal of excavated materials generated by the project.
- C. Backfill Materials Reports: Submit backfill materials reports in conformance with paragraph.3.07.A.
- D. Backfill Materials Certifications: Submit manufacturer materials certifications in conformance with paragraph 3.07.B.
- E. Compaction Testing: Submit compaction testing and retesting results in conformance with paragraphs 3.06 and 3.07.C on a daily basis.

##### 1.02 PROFILES AND TOPOGRAPHY

- A. Contours, topography and profiles of the ground shown on the Drawings are believed to be reasonably correct representation of existing grade, but are not guaranteed to be absolutely so and are presented only as an approximation. The CONTRACTOR shall accept the construction site with conditions the same as existed at the time of bidding.

#### **PART 2 - PRODUCTS**

##### 2.01 GENERAL

- A. The trench backfill and surface restoration requirements shall conform the requirements of California American Water as shown or noted on the Drawings or as specified herein.



## 2.02 BACKFILL MATERIALS

- A. Clean Sand: Clean sand shall be free from deleterious materials and conform to the following gradation and plastic index requirements:
  - 1. Gradation
    - a. U.S. Standard Sieve Sizes: No. 4, No. 200
    - b. Percent Passing: 100, 0-12
  - 2. Plastic Index: Shall not exceed 2 when measured in accordance with AASHTO Designation: T 90.
- B. Aggregate Base Material: Aggregate Base Material shall be Class 2,  $\frac{3}{4}$  inch maximum aggregate base in accordance with the requirements of Section 26, "Aggregate Bases", of the State Specifications.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION EQUIPMENT

- A. Where the work is located in or adjacent to pavements, all equipment shall have rubber tires. Crawler equipment shall be permitted when there is no danger of damaging pavement. It is the CONTRACTOR'S responsibility, to repair, at CONTRACTOR expense, any damages due to the use of any equipment to complete the work. **Blasting shall not be allowed**, rock excavation shall be accomplished with hydraulic hammers or rotary rock grinders only.

### 3.02 NOISE, DUST AND ODOR CONTROL

- A. The CONTRACTOR'S construction activities shall be conducted so as to eliminate all unnecessary noise, dust and odors.

### 3.03 PROTECTION OF TREES

- A. Special care shall be taken to avoid damage to trees and their root system. Machine excavation shall not be used when, in the opinion of the ENGINEER, it would endanger the tree. In general, where the line of trench falls within the limits of the limb spread, headers are required across the trench to protect the tree. The operation of all equipment, particularly when employing booms, the storage of materials, and the disposition of excavation shall be conducted in a manner which will not injure trees, trunks, branches or their roots unless such trees are designated for removal.

### 3.04 TRENCH SUPPORT

- A. Unsupported open cut excavation for mains will not be permitted where trenching may cause danger to life, unnecessary damage to street pavement, trees, structures, poles, utilities, or other private or public property. During the progress of the work, whenever and wherever it is necessary, the CONTRACTOR shall, at his expense, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing or other approved means. Such trench support materials and equipment shall be maintained and remain in place until backfilling operations have progressed to the point where the supports may be withdrawn without endangering property. All work shall be performed in accordance with the State OSHA requirements.

### 3.05 TRENCH EXCAVATION

- A. General Excavation: General excavation shall consist of the satisfactory removal and disposal of all materials encountered, including rock, taken from within the limits of the Work contracted, meaning the material lying between the existing ground line and the bottom of the trench as shown on the Drawings and as required by the Specifications, regardless of whether the existing ground line is exposed to air or is covered by water. It is distinctly understood that any reference to earth, rock, silt, debris or other materials on the Drawings or in the Specifications is solely for the OWNER's information and shall not be taken as an indication of classified excavation or the quantity of earth, rock, silt, debris or other material encountered.
  - 1. All excavation shall be made to the lines and grades indicated on the Drawings and as required by the Specifications or established in the field by the ENGINEER.
  - 2. All excavated materials shall be properly disposed of by the CONTRACTOR clear of the site. The CONTRACTOR shall furnish to ENGINEER satisfactory evidence that an appropriate disposal site will be used.
- B. Trench Width: The width of trenches shall be held to a minimum to accommodate pipe and appurtenant installations. In no case shall the minimum trench width be less than two (2) feet, and the maximum trench width should not be greater than the outside diameter of the pipe, plus two (2) feet. It is distinctly understood that the CONTRACTOR accepts total responsibility for the means and methods to provide trench support to accomplish an appropriate trench width.
- C. Trench Width Outside of "Neat Lines": If, for any reason, the trench width exceeds the maximum trench width defined in paragraph 3.5.B, above, the

CONTRACTOR shall properly dispose of the additional excavated material, provide additional backfill materials as specified in paragraph 2.2 and backfill and compact the additional volume of trench, in conformance with paragraph 3.06, at no additional cost to the OWNER.

#### D. Trench Depth

1. General: All trenches shall provide for a minimum of 36-inches of cover from the top of the pipe to finished grade, unless otherwise authorized by the ENGINEER.
2. Soil: Where excavation is made in soil, the trench shall be excavated to a depth of: the cover shown on the Drawings, plus the outside diameter of the pipe, plus 6-inches (thickness of pipe bed) below the bottom of the pipe. The bottom of the trench shall be accurately prepared by means of hand tools, so as to provide a uniform and continuous bearing support to install the pipe bed. All loose material shall be removed from the trench bottom. After preparation of the trench bottom, a pipe bed shall be prepared in conformance with paragraph 3.06.A.
3. Rock: Where excavation is made in rock or boulders, the trench shall be excavated to a depth of: the cover shown on the Drawings, plus the outside diameter of the pipe, plus 8 or 12 inches (thickness of pipe bed) below the bottom of the pipe, determined as follows: an 8-inch bed for pipes with a nominal diameter of 12-inches or less, a 12-inch bed for pipes with a nominal diameter of 16-inches or greater. All loose material shall be removed from the trench bottom. After preparation of the trench bottom, a pipe bed shall be prepared in conformance with paragraph 3.6.A.
4. Unsuitable Bottom: When unsuitable material is found below subgrade, as determined by the ENGINEER, the CONTRACTOR shall remove the unsuitable material to a depth determined by the ENGINEER, and provide clean compacted sand as specified in paragraph 3.06.B, to backfill to the bottom of the trench in areas where unsuitable material has been excavated below the bottom of the trench.

### 3.06 TRENCH BACKFILLING AND COMPACTION

- A. Pipe Bed: Prior to pipe and appurtenant installation, fine grade and hand place a uniform density layer of clean sand in accordance with paragraph 2.02.A, to the thickness as specified in paragraph 3.05.D, for pipe and appurtenances. Trench shall be backfilled as described below immediately after pipe is laid.

- B. Bottom of Pipe to Springline: Clean sand, as described in paragraph 2.02.A, shall be used to backfill the trench from the bottom of the pipe to springline of the pipe, and shall be compacted to 90% of maximum dry density as measured by the Standard Proctor Method in accordance with ASTM 698 with placement of the material in uniform, not to exceed, 4-inch loose layers, and eliminating the possibility of settlement, pipe misalignment or damage of joints.
- C. Springline to 12-inches above the Top of Pipe: Clean sand, as described in paragraph 2.02.A, shall be used to backfill the trench from springline of the pipe to 12-inches above the top of pipe, and shall be compacted to 90% of maximum dry density as measured by the Standard Proctor Method in accordance with ASTM 698 with placement of the material in uniform, not to exceed, 6-inch loose layers and avoiding injury to or moving the pipe.
- D. Remaining Trench Backfill: Aggregate Base, as described in paragraph 2.02.B, shall be used to backfill the trench from 12-inches above the top of pipe to the subgrade of the finished surface courses, and shall be compacted to 90% of maximum dry density as measured by the Standard Proctor Method in accordance with ASTM 698 by placing the material in accordance with requirements of Section 26, "Aggregate Bases", of the State Specifications.
- E. Surface Conditions: The trench surface shall be regularly attended to during the course of the Contract. The CONTRACTOR shall take prompt corrective measures to correct any settlement or wash-out. The trench surface shall be maintained in a safe condition and shall not interfere with natural drainage. **All trenches shall be completely backfilled and receive temporary pavement or install traffic rated recessed steel plates at the end of each day per Section 01500 – Temporary Facilities.**
- F. Deficiency of Backfill: Any materials required for backfilling the trenches or for filling depressions caused by settlement or wash-out shall be supplied and placed by the CONTRACTOR at his expense.

### 3.07 QUALITY CONTROL AND ASSURANCE

- A. Backfill Materials Report: The CONTRACTOR is responsible for obtaining and paying all costs to employ an independent, materials testing laboratory to conduct and prepare backfill materials reports, for all backfill materials proposed for use on the project. Each proposed material source will require a report and shall be sealed and signed a registered professional Geotechnical Engineer, in good standing with the State Board. To be accepted, the report(s) shall evaluate representative samples of the proposed backfill materials for use on the project, demonstrate and conclude that the backfill materials meet the requirements of these Specifications and the

specifications of Federal, State and local authorities (where applicable).

- B. Backfill Material Certifications: The CONTRACTOR shall provide the ENGINEER with manufacturer certificates which state the following: “The representative samples provided to and tested by the independent materials testing laboratory are representative of all of the backfill materials which will be furnished to this project and comply in all respects to the Specifications”.
- C. Compaction Testing: The CONTRACTOR is responsible for obtaining and paying all costs to employ an independent, materials testing laboratory to conduct compaction testing of backfill. The material testing laboratory shall be certified, and the testing shall be conducted under the direction of a registered professional Geotechnical Engineer, in good standing with the State Board.
- D. The materials testing laboratory will conduct, measure and document a minimum of four (4) trench compaction tests, every 50 feet along the trench (test at springline, at one-foot above the top of pipe and at two (2) other elevations within the remaining trench backfill as directed by the ENGINEER). Each test will document the station and location within the trench where the test was conducted.
- E. Quality Assurance: Additional material and compaction quality assurance testing may be conducted by the ENGINEER at anytime, with these tests being paid for by the OWNER, and not subject to claim by the CONTRACTOR for additional compensation or time due to requirements necessary to perform additional tests.
- F. If materials or compaction results fail to meet the requirements of these Specifications, the CONTRACTOR shall perform remedial work and retest, until the backfill material is placed in conformance with these Specifications, with all additional costs required to perform paid for by the CONTRACTOR.

### 3.08 TRENCH MAINTENANCE

- A. The CONTRACTOR shall be responsible for the condition of the trenches for a period of one (1) year from the date of the final acceptance of the CONTRACTOR'S work, or as required by state, county or local authorities, and any materials required for filling depressions caused by settlement or washout shall be supplied and placed by, and paid for by the CONTRACTOR.

**\*\* END OF SECTION \*\***

## SECTION 02540

### EROSION AND SEDIMENTATION CONTROL

#### **PART 1 - GENERAL**

##### 1.1 SCOPE OF WORK

- A. The CONTRACTOR shall be responsible for the design, permitting, construction, maintenance and close-out of erosion and sedimentation systems, at the construction site and all areas disturbed during construction, including borrow areas and private property.
- B. In addition to the requirements of these specifications, the CONTRACTOR will comply with all rules and regulations and all other Federal, State and local requirements for erosion and sedimentation control.

##### 1.2 STANDARDS

- A. CONTRACTOR shall furnish, install and maintain Storm Water Best Management Practices (BMPs) for erosion and sedimentation control standards in accordance with local, county, and state requirements.

#### **PART 2 - PRODUCTS**

##### 2.1 GENERAL

- A. All materials such as seeds, mulch, bales, barriers, traps, etc, shall conform to the applicable Federal, State and local requirements.

#### **PART 3 - EXECUTION**

##### 3.1 GENERAL

- A. The CONTRACTOR shall execute the design, permitting, construction, maintenance, and close-out, of erosion and sedimentation system in conformance with the requirements of applicable Federal, State and local requirements.

\*\*\* END OF SECTION \*\*\*

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## SECTION 02820

### LANDSCAPE RESTORATION

#### **PART 1 - GENERAL**

##### 1.1 DESCRIPTION

- A. The CONTRACTOR shall restore and replace shrubbery, fencing, sod, irrigation systems, decking, pavers, brick and all other disturbed surfaces or structures (hereafter referred to as landscape improvements) to conditions equal to that before the work began and to the satisfaction of the PROPERTY OWNER, and the ENGINEER.

#### **PART 2 - PRODUCTS**

##### 2.1 LANDSCAPE IMPROVEMENTS

- A. All existing landscape improvements which are disturbed shall be replaced with materials and products equal to those before the work began.

#### **PART 3 - EXECUTION**

##### 3.1 PRECONSTRUCTION INVENTORY

- A. The CONTRACTOR is responsible for obtaining and paying all costs to employ an independent LANDSCAPE ARCHITECT (provide submittal of proposed professional) in good standing with the State Board to oversee restoration of existing landscape improvements associated with the project.
- B. The approved LANDSCAPE ARCHITECT shall conduct and provide a submittal of a preconstruction inventory which describes the existing landscape improvements, i.e., type and condition of existing plant materials, irrigation systems, other surfaces and landscaping improvements present at each property. The inventory shall include preconstruction photographs. The LANDSCAPE ARCHITECT shall use the inventory to specify landscape restoration techniques, materials, and products for the CONTRACTOR to utilize in the restoration of each property.

##### 3.2 PERFORMANCE OF WORK

- A. All existing landscape improvements which are disturbed shall be restored by the CONTRACTOR to conditions equal to that before the work began in accordance with the direction provided by the LANDSCAPE ARCHITECT and to the satisfaction of the PROPERTY OWNER, LANDSCAPE ARCHITECT and the



ENGINEER.

### 3.3 INSPECTION

- A. The LANDSCAPE ARCHITECT shall conduct post-construction inspection of the landscape restorations. The LANDSCAPE ARCHITECT shall generate a report, for submittal, of findings and punch-list items for required for final completion. The post construction inspection shall include post-construction photographs.

### 3.4 MAINTENANCE

- A. All disturbed landscape improvements shall be carefully maintained by the CONTRACTOR as necessary to secure a restored condition. The CONTRACTOR shall be responsible for the condition of landscape improvements for a period of one year from the date of final completion.

\*\*\* END OF SECTION \*\*\*

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### **PART 1 - GENERAL**

##### 1.1 SCOPE

A. The CONTRACTOR shall furnish all labor, materials, tools and equipment to, provide cast-in-place concrete for new and replacement of existing structures as outlined below in accordance with Agency standards and these specifications.

##### B. SUBMITTALS

1. Shop drawings and manufacturer's literature for all materials.
2. Surplus material disposal agreement(s).

#### **PART 2 - PRODUCTS**

##### 2.1 GENERAL

A. Materials for cast-in-place concrete shall be minimum 3000 psi, ¾ inch maximum aggregate concrete furnished in accordance with applicable Caltrans or Greenbook Standards.

B. For sealing ends of abandoned water mains, material shall be grout or approved equivalent.

#### **PART 3 - EXECUTION**

##### 3.1 INSTALLATION

A. Thrust Blocks: Where concrete thrust blocks are employed, they shall be furnished in accordance with the standard detail provided in the Drawings.

B. Curb and Gutter: In accordance with Los Angeles county public works standard plans.

C. Meter and Backflow Preventer Pad: In accordance with detail shown on the Drawings or applicable California-American Water Standard Details.

##### 3.2 MAINTENANCE

A. During the entire period of construction of the project, all streets, curbs, drives

and walks shall be kept in clean, usable and safe condition for public use.

\*\*\* END OF SECTION \*\*\*

## SECTION 15000

### PIPELINES - GENERAL PROVISIONS

#### **PART 1 - GENERAL**

##### 1.1 DRAWINGS

- A. Dimensions shown on Contract Drawings are approximate only. CONTRACTOR shall verify all piping geometry in the field and shall be responsible for insuring proper alignment and fit of all piping consistent with the intent of the Contract Drawings. Field layout drawings shall be submitted as required for approval.

#### **PART 2 - PRODUCTS**

##### 2.1 CONTRACTOR'S RESPONSIBILITY FOR MATERIAL

- A. The CONTRACTOR shall carefully examine all material for defects. Material which is known, or thought, to be defective shall not be installed.
- B. The ENGINEER reserves the right to inspect all material and to reject all defective material shipped to the job site or stored on the site. Failure of the ENGINEER to detect damaged material shall not relieve the CONTRACTOR from his total responsibility for the completed work if it leaks or breaks after installation. Lay all defective material aside for final inspection by the ENGINEER to determine if corrective repairs may be made, or if the material is to be rejected. The ENGINEER shall determine the extent of the repairs.
- C. The CONTRACTOR to classify defective pipe prior to ENGINEER's inspection as follows:
  1. Damage to interior and/or exterior paint seal coats.
  2. Damage to interior cement-mortar lining.
  3. Insufficient cement-mortar lining thickness.
  4. Poor quality interior paint seal coat.
  5. Pipe out of round.
  6. Damaged pipe barrel area to a point where pipe class thickness is reduced.
  7. Denting or gouges in plain end of pipe.

- D. The CONTRACTOR shall be responsible for all material, equipment, fixtures and devices furnished and such materials, equipment, fixtures and devices shall comply with the requirements and standards of all Federal, State and local laws, ordinances, codes, rules and regulations governing safety and health.
- E. The CONTRACTOR shall be solely responsible for the safe storage of all material furnished to or by him until it has been incorporated in the completed project and accepted by the ENGINEER.
- F. Pipe, fittings, valves, hydrants and related accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe. Handling of this material is to be in accordance with AWWA C600.
- G. Keep fittings and valves drained and stored before installation in a manner protecting them from damage due to freezing of trapped water in accordance with Section 01600.

## 2.2 CERTIFICATION

- A. All pipe, fittings, lining systems, valves and appurtenance in contact with potable water shall be certified and labeled in compliance with NSF/ANSI 61 requirements.
- B. All disinfectant chemicals used in the disinfection of pipelines and appurtenances shall be certified for potable water use in accordance with NSF/ANSI 60.
- C. All pipe, fittings, valves and appurtenance used within the potable water piping system shall comply with NSF/ANSI 372 and conform to “lead-free” plumbing requirements as defined by California and the latest U.S. Safe Water Drinking Act.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION - GENERAL REQUIREMENTS

- A. All pipe shall be laid and maintained to the required lines and depths. Fittings, valves and hydrants shall be at the required locations with joints centered, spigots home and all valve and hydrant stems plumb and otherwise in strict accordance with the Specifications.

- B. Pipe bell and fitting restraint systems shall be used where called for on the drawings. CONTRACTOR shall verify the restraint length of piping and fitting by including restrained length information on the pipe layout submittals.
- C. All buried steel lugs, rods, brackets and flanged joint bolts and nuts shall be given one (1) coat of Koppers #50 coal tar coating prior to backfilling.
- D. No deviation shall be made from the required alignment, depth or grade except with the written consent of the ENGINEER.
- E. All pipe shall be laid to the depth specified. The depth shall be measured from the final surface grade to the top of the pipe barrel. The minimum pipe cover shall be as shown on the Drawings or as specified in the Specifications Special Conditions.
- F. Do not lay pipe in a wet trench, or when trench conditions are unsuitable for such work. If all efforts fail to obtain a stable dry trench bottom and the ENGINEER determines that the trench bottom is unsuitable for trench foundation, he will order in writing the kind of stabilization to be constructed.
- G. Thoroughly clean the pipes and fittings before they are installed and this material shall be kept clean until the acceptance of the completed work. Lay pipe with the bell ends facing in the direction of laying, unless otherwise shown on the Drawings, or directed by the ENGINEER. Exercise care to ensure that each length abuts against the next in such manner that no shoulder or unevenness of any kind occurs in the pipe line. No wedging or blocking is permitted in laying pipe unless by written order of ENGINEER.
- H. Before joints are made, bed each section of pipe the full length of the barrel with recesses excavated so pipe invert forms continuous grade with invert of pipe previously laid. Do not bring succeeding pipe into position until the preceding length is embedded and securely in place.
- I. Dig bell holes sufficiently large to permit proper joint making and to insure pipe is firmly bedded full length of its barrel.
- J. Walking or working on completed pipeline, except as necessary in tamping and backfilling, is not permitted until trench is backfilled one-foot deep over top of pipes.
- K. Take up and relay pipe that is out of alignment or grade, or pipe having disturbed joints after laying.
- L. Take up and replace with new, such in-place pipe sections found to be defective. Replacement work shall be at CONTRACTOR's expense.

- M. Take necessary precautions to prevent the floating of the pipeline by the accumulation of water in the trench, or the collapse of the pipeline from any cause. Should floating or collapse occur, restoration shall be at the CONTRACTOR's expense.
- N. Bedding materials and concrete work for the pipe bedding and thrust restraint shall be as specified previously in Division 2 and 3 respectively.
- O. Take every precaution to prevent foreign material from entering the pipe while it is being placed. During laying operations, do not place debris, tools, clothing, or other materials in the pipe.
- P. Close all openings in the pipeline with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods.
- Q. Place enough backfill over the center sections of the pipe to prevent floating.
- R. Carry out the cutting of pipe only with equipment specifically designed for that purpose such as an abrasive wheel, rotary wheel cutter, a guillotine pipe saw or a milling wheel saw. The use of chisels or hand saws will not be permitted. Cut ends and rough edges should be ground smooth and for push-on connections, the cut end should be beveled lightly.
- S. In distributing material at the site of the Work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
- T. Each length of pipe shall be adequately blocked to prevent movement. Stockpiled pipe shall be adequately blocked to prevent movement. No pipe, material, or any other object shall be placed on private property, obstruct walkways or driveways, or in any manner interfere with the normal flow of traffic.
- U. In the case of PVC, prestressed concrete, gray and ductile iron pipe, special care shall be exercised, during handling temporary storage or construction to avoid damage to the bells, spigots or flanged ends. If damaged pipe cannot be repaired to the ENGINEER's satisfaction, it shall be replaced at the CONTRACTOR's expense. Damaged PVC pipe shall be replaced at CONTRACTOR's expense.
- V. The CONTRACTOR shall remove all existing pipe, fittings, valves, pipe supports and blocking and all other items necessary to provide space for making connections to existing pipe and installing all piping which is to be done under this Contract.

- W. The CONTRACTOR shall be responsible for maintaining the minimum required distance between the water line and other utility lines in strict accordance with all Federal, State and local requirements and all right-of-way limitations.
- X. Particular care shall be exercised such that no high points are established where air can accumulate. In the event that unforeseen field conditions necessitate a change in the pipe profile and, in the opinion of the ENGINEER, the resulting change requires the installation of an air release valve and manhole, install the same as extra Work to the Contract. If the CONTRACTOR requests a change in the pipe profile solely for ease of construction, and the requested change requires the installation of an air release valve and manhole as determined by the ENGINEER, then the cost of furnishing and installing the air release valve and manhole will be at the expense of the CONTRACTOR.

### 3.2 CONSTRUCTION METHODS TO AVOID CONTAMINATION

- A. Heavy particulates generally contain bacteria and prevent even very high chlorine concentrations from contacting and killing such organisms. It is essential that the procedures of this section be observed to assure that a water main and its appurtenances are thoroughly clean for the final disinfection by chlorination.
- B. Precautions shall be taken to protect the interiors of pipes, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used where it is determined that watertight plugs are not practical and where thorough cleaning will be performed.
- C. Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the less likelihood of contamination.
- D. Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.
- E. Yarning or packing material shall consist of molded or tubular rubber rings, or rope of treated paper or other approved materials. Materials such as jute, asbestos or hemp shall not be used. Packing material shall be handled in a manner that avoids contamination.



- F. No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water. It shall be delivered to the job in closed containers and shall be kept clean.
- G. If dirt enters the pipe, and in the opinion of the ENGINEER the dirt will not be removed by the flushing operation, the interior of the pipe shall be cleaned by mechanical means and then shall be swabbed with a 1% hypochlorite disinfecting solution. Cleaning with the use of a pig, swab or "go-devil" should be undertaken only when the ENGINEER has specified such and has determined that such operation will not force mud or debris into pipe joint spaces.
- H. If it is not possible to keep the pipe and fittings dry during installation, every effort shall be made to assure that any of the water that may enter the pipe joint spaces contains an available chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of pipe before it is lowered into a wet trench, or by treating the trench water with hypochlorite tablets.
- I. If the main is flooded during construction, it shall be cleared of the flood water by draining and flushing with potable water until the main is clean. The section exposed to the flood water shall then be filled with a chlorinated potable water that, at the end of a 24 hour holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main. After construction is completed, the main shall be disinfected using the continuous feed or slug method.

### 3.3 VALVE INSTALLATION

- A. Prior to installation, inspect valves for direction of opening, freedom of operation, tightness of pressure containing bolting, cleanliness of valve ports and especially seating surfaces, handling damage and cracks. Correct defective valves or hold for inspection by the ENGINEER.
- B. Set and join to the pipe in the manner specified in Section 3.1. Provide valves with special support, such as crushed stone or concrete pads, so that the pipe will not be required to support the weight of the valve. Set truly vertical.

- C. Provide all valves with a valve box. Set the top of the valve box neatly to the grade of the surface of the existing ground, unless directed otherwise by the ENGINEER. Do not transfer shock or stress to the valve, and center and plumb the box over the wrench nut of the valve. Do not use valves to bring misaligned pipe into alignment during installation. Support pipe in such manner as to prevent stress on the valve.

### 3.4 THRUST RESTRAINT

- A. Provide all plugs, caps, tees, and bends (both horizontal and vertical) with concrete thrust blocks and/or restrained joint pipe as detailed on the Drawings, and in accordance with the specifications.
- B. Place concrete thrust blocks between undisturbed solid ground and the fitting to be anchored. Concrete thrust blocks to be installed in accordance with Specification Section 03300. The thrust blocks, unless otherwise shown or directed, shall be located as to contain the resultant thrust force and so that the pipe and fitting joints will be accessible for repair.
- C. Temporary thrust restraint at temporary caps or plugs shall be the responsibility of the CONTRACTOR. Submit details of temporary restraint to the ENGINEER for approval.

### 3.5 REMOVAL AND DISPOSAL OF EXISTING PIPE & APPURTENANCES

- A. Existing pipe and appurtenances, including asbestos cement pipe, required to be removed for the installation of proposed facilities and as noted on the plans, shall be removed from the project site and disposed of by the CONTRACTOR in accordance with all current applicable Federal, State and Local standards and requirements. Removal and disposal costs shall be incorporated into bidding schedule items of work (no separate payment shall be allowed).

### 3.6 SERVICE INSTALLATION

- A. Unless otherwise noted on plans, all water services shall be 1" and conform to California American Water Standard Drawings COR-1 and COR-2.
- B. Contractor shall remove and replace meter boxes at locations shown on the Project Plans. Meter boxes for 1" services shall be Armorcast Polymer Concrete Boxes, Model No. A6000485SA with Model No. A6000484DQ Cover with Model No. A6000487T Drop-In Lid, or approved equal. Meter boxes for 2" services shall be Armorcast Polymer Concrete Boxes, Model No. A6001419SA, with Model No. A6001420DW cover with Model No. A6000481DT drop-in lid, or approved equal.

- C. Contractor shall reuse and transfer existing water meters from old meter boxes to new meter boxes.
- D. Any concrete or landscape improvements that are damaged during service and meter installation shall be restored to original condition. Contractor shall remove and replace damaged concrete improvements to nearest joint.
- E. Trench resurfacing for service installation shall be according to City Requirements listed on Sheet 2 of the Project Plans.

\*\*\* END OF SECTION \*\*\*

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## SECTION 15020

### DISINFECTING WATER MAINS

#### **PART 1 - GENERAL**

##### 1.1 SCOPE OF WORK

- A. The CONTRACTOR shall disinfect and flush all water distribution facilities in accordance with ANSI/AWWA C651 Standard for Disinfecting Water Mains and these specifications.
- B. The OWNER will furnish water for testing, flushing and disinfecting pipelines. The OWNER will also perform bacteriological testing.
- C. All chlorination, flushing and sampling events shall be scheduled at least 48-hours in advance with the ENGINEER and OWNER.

##### 1.2 SUBMITTALS

- A. Shop drawings and manufacturer's literature for all materials.
- B. Affidavit of Compliance with AWWA B300 and B301 from manufacturer.
- C. Plan for disposal of dechlorinated water.

#### **PART 2 - PRODUCTS**

##### 2.1 GENERAL

- A. The CONTRACTOR shall use forms of chlorine in accordance with Section 4.1 of ANSI/AWWA C651 and the provisions of ANSI/AWWA B300 Standard for Hypochlorites and ANSI/AWWA B301 Standard for Liquid Chlorine.
- B. Backflow Protection shall be provided in accordance with the Soft Connection Detail in Cal-Am Standard Details and these specifications.

#### **PART 3 - EXECUTION**

##### 3.1 GENERAL

- A. The CONTRACTOR shall follow the basic disinfection procedure in accordance with Section 4.2 of ANSI/AWWA C651.

### 3.2 CONSTRUCTION PROCEDURES

- A. The CONTRACTOR shall follow the preventive and corrective measures during construction in accordance with Section 4.3 of ANSI/AWWA C651.
- B. The CONTRACTOR shall install backflow protection in accordance with the OWNERS requirements.

### 3.3 METHODS OF CHLORINATION

- A. The CONTRACTOR shall use a chlorination method in accordance with Section 4.4 of ANSI/AWWA C651.
- B. If the CONTRACTOR elects to chlorinate or is required to re-chlorinate using the continuous-feed or slug method, the CONTRACTOR shall obtain and submit an equipment design, sealed and signed by a Registered Engineer in good standing with the State Board, and employ a current Class 4 operator to perform the disinfection work.
- C. The OWNER will furnish water for filling and flushing water mains, through a CONTRACTOR provided and installed backflow protection device.

### 3.4 FINAL FLUSHING

- A. The CONTRACTOR shall follow the final flushing procedures in accordance with Section 4.5 of ANSI/AWWA C651.
- B. Heavily Chlorinated water shall not remain in contact with pipe and appurtenances for more than 48 hours after the applicable retention period.
- C. Heavily chlorinated water shall be neutralized with a neutralizing chemical listed in Appendix B, which is attached to AWWA C651.
- D. The CONTRACTOR shall contain the dechlorinated water in a water truck, and arrange for the disposal in a nearby quarry, in accordance with City requirements. The CONTRACTOR shall obtain necessary dewatering permits and coordinate disposal procedure with the City of Bellflower

### 3.5 FINAL CONNECTION TO EXISTING MAINS (REQUIRED)

- A. The CONTRACTOR shall follow the final connection procedures in accordance with Section 4.6 of ANSI/AWWA C651.
- B. Temporary blow-offs shall be removed by the CONTRACTOR and final connection pipe shall be provided and installed by the CONTRACTOR as indicated on the drawings.
- C. The CONTRACTOR shall assist the OWNER with any additional flushing the OWNER may perform.

### 3.6 CUTTING IN EXISTING MAINS

- A. The CONTRACTOR shall install pipe and fitting assemblies shown on the drawings in accordance with Section 4.7 of ANSI/AWWA C651, these assemblies shall be installed prior to chlorination of any water mains, to ensure that the final connection can be installed as indicated on the drawings.

### 3.7 BACTERIOLOGICAL TESTS

- A. The OWNER shall perform the bacteriological tests in accordance with Section 5.1 of ANSI/AWWA C651.
- B. Bacteriological tests shall demonstrate complete absence of coliform organisms. If tests show presence of coliform organisms, the CONTRACTOR will be required to perform additional flushing and disinfection of the pipeline until such time acceptable tests are obtained, all at no additional cost to the OWNER.
- C. The CONTRACTOR will not be charged for the additional water provided or bacteriological testing performed by the OWNER.

\*\*\* END OF SECTION \*\*\*

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## SECTION 15025

### CLEANING PIPELINES

#### **PART 1 - GENERAL**

##### 1.1 SCOPE OF WORK

When OWNER or CONTRACTOR determines that normal flushing will not sufficiently remove dirt and debris introduced during construction the CONTRACTOR shall clean the required pipelines installed under these Contract Documents.

##### 1.2 GENERAL

A. After the installation of water mains normal flushing often may prove inadequate to remove all the entrapped air, loose debris and other objects that may have been left in the main during installation. Therefore, after the installation of water mains it may be necessary to use polyurethane foam pigs and/or polyurethane hard foam swabs or "go devils" to remove all foreign matter from the pipeline (i.e. "pig" the pipeline).

##### 1.3 PROTECTION DURING FLUSHING AND CLEANING

- A. The CONTRACTOR shall assure that an adequate amount of flushing water at sufficiently high pressures exists and that disposal of the water can be done safely. Do not flush a large main supplied by a single smaller one as the volume available is usually inadequate for flushing.
- B. Prior to flushing, or cleaning, the CONTRACTOR shall notify OWNER, ENGINEER and the following:
1. Fire Department
  2. Other utilities, such as gas, electric and telephone companies, who may have underground facilities in the area.
  3. Customers who may be inconvenienced by reduced pressure or dirty water.

#### **PART 2 - PRODUCTS**

##### 2.1 MATERIALS AND EQUIPMENT

A. The CONTRACTOR shall furnish the foam cleaning plugs, labor and equipment as needed to pig all pipelines, and shall furnish all materials required for the expulsion of air and other debris from pipelines.

- B. As the cleaning described in this section pertains to new water mains, the use of pipe cleaning plugs which utilize Bristles, wire brushes, carbide abrasives, steel studs or any other Type abrasive is not permitted unless specifically approved by the ENGINEER.
- C. The CONTRACTOR is to consult a manufacturer of pipe cleaning plugs, such as Knapp Polly Pig (Houston, Texas), to determine the type and size of cleaning plug best suited for the application. Two types of plugs shall be considered and are described as follows:
  - 1. Swabs: Swabs used for cleaning mains shall be made of polyurethane foam. This foam has a density of 1 to 2 lb./cu. ft. Swabs shall be purchased from commercial manufacturers of swabs for pipes. Both soft and hard grade foam swabs are available. New mains are typically cleaned with hard foam swabs.
  - 2. Pigs: The other type of cleaning plug available is called a pig. Pigs, if used, shall be commercially manufactured for the specific purpose of cleaning pipes. They shall be made of polyurethane foam weighing 2 to 15 lb./cu.ft. Pigs are bullet shaped and come in various grades of flexibility and roughness.
  - 3. Sizing of Plugs: Use swabs cut into cubes and cylinders slightly larger than the size of the pipe to be cleaned. Cubes one inch larger in dimension than the nominal diameter of the pipe being cleaned have worked well for cleaning pipes up to 12-inches in diameter.
- D. For mains greater than 12-inches in diameter, the swab diameter must be considered individually for each operation. For new mains, swabs 3-inches larger than the pipe diameter have worked well. Swabs for the larger mains are usually 1-1/2 times the diameter in length.
- E. Use pigs typically 1/4-inch to 1/2-inch larger in diameter than the pipe to be cleaned. Consult suppliers for the proper size of plug to use on the specific job.

## **PART 3 - EXECUTION**

### **3.1 PLUG INSTALLATION AND REMOVAL**

- A. In general, the CONTRACTOR shall furnish all equipment, material, and labor to satisfactorily install or expose cleaning wyes, or other entry or exit points. Remove cleaning wye covers, etc., as required by the ENGINEER and to insert the plugs into the mains.

- B. In mains greater than 8-inches, Wyes shall be used at the entry and exit points. Fabricate the wye section one size larger than the main to ease the insertion and extraction of the plug. The use of wyes, as with the previously mentioned appurtenances, requires an outside source of pressurized water for launching. Cap the wye with a flange with a 2 to 6 inch fitting for connecting with the pressurized water source.
- C. Many pigs, since they are less flexible than swabs, are harder to insert into a pipe. Other methods acceptable to insert pigs include:
  - 1. winching with a double sling,
  - 2. winching with a rope attached to the pig,
  - 3. compression with a banding machine prior to insertion, and
  - 4. the use of a specially designed tapered steel pipe which is removed after use.
- D. During swab or pig installation, leave as much water as possible in the main to be cleaned. The water suspends the material being removed from the pipe and minimizes the chance of the material forming a solid plug. Water in the pipe also keeps the swab or pig from traveling through the pipe at excessive rates. If swabs or pigs travel too fast they will remove less material. The swab or pig will also wear more rapidly in such a case.
- E. At the exit point or blow-off, install a wye long enough to house the swab or pig. Attach temporary piping to the end cap to allow the drainage of the water.
- F. Where expulsion of the cleaning plugs is required through a dead end main, the CONTRACTOR shall prevent backflow of purged water into the main after passage of the cleaning plug. This can be accomplished by installing mechanical joint bends and pipe joints to provide a riser out of the trench. Additional excavation of the trench may serve the same purpose and is acceptable.

### 3.2 PRE-CLEANING PROCEDURES

- A. Preplan and prepare for the ENGINEER's review, a written cleaning plan.
- B. Suggested procedures prior to cleaning include the following:
  - 1. Identify mains to be cleaned on a map. Mark the location of the entry, water supply and exit points, any blow-offs to be used, main gates to be closed, and the path of the swab or pig.
  - 2. Assist OWNER to inspect and operate all valves and hydrants to be used

in the cleaning operation. Ensure that all operate correctly and that a tight shutdown is possible.

3. Check location and type of hydrants, launch and exit location, and blow-offs to be used. Make blow-off tap connections if necessary.
4. The OWNER will notify customers served by the main to be cleaned that their water will be off for a specified period on the day of the cleaning.
5. The OWNER will identify customers who may require temporary services during the main cleaning operation. The CONTRACTOR shall provide the temporary connections.
6. Determine the number and size of plugs to be used.

### 3.3 CLEANING PROCEDURE

A. After review by the ENGINEER of the CONTRACTOR's cleaning plan the following cleaning procedures as applicable shall be performed by the CONTRACTOR:

#### 1. Swab Cleaning Procedures

- a. Open the water supply upstream of the swab. Throttle the flow in the main at the discharge (plug exit) point so that the swab passes through the main at a speed of 2 to 4 fps. At this velocity, swabs will effectively clean pipes for distances of up to 4000 feet before disintegrating to a size smaller than the main. Use pitot gauges at the exist hydrant or blow-off to estimate the flow rate in the main
- b. Note the time of entry of the swab into the main and estimate its time or arrival at the exit point. If the swab does not reach the exit point in the estimated time plus ten minutes, then a blockage has probably occurred. Reverse the flow in the main and note the time required for the swab to reach the original entry point. From the return travel time, approximate the location of the blockage. The ENGINEER may require a swab to which a transmitter has been attached to be used to accurately locate a blockage.
- c. Once the first swab has been recovered, typically, make two to three runs of four to five swabs each depending on how quickly flushing water clears.
- d. Continue operations until the water behind the swabs emerging at the exit clears up within one minute. Account for all swabs inserted into

the main.

- e. After the last swab has been recovered, flush the main to remove swab particles. This may require up to an hour of flushing.

## 2. Pig Cleaning Procedures

- a. Remove all air valves along the line. This will provide pressure relief should the pig suddenly stop and assure that no air is trapped in the main.
- b. If the pig is inserted directly into the main, set it in motion by opening the upstream gate valve and a downstream fire hydrant or blow-off valve (usually the valve on the capped end at the exit point). If the pig is launched from a wye, fire hydrant, or other appurtenance, use an external pressurized water source to inject the pig into the main as described in Section 3.1.
- c. Once the pig is in motion in the main, control it's speed by throttling the discharge at a downstream fire hydrant or blow-off. Operate pigs typically at 1 fps. This slow speed will help prevent pressure surges when the pig passes through undersized valves, enters smaller pipes, or turns through tees or crosses. Speeds of up to 2 fps. can be used on straight runs with no restrictions or sharp turns.
- d. Make sufficient passes of the pig to obtain thorough cleaning. Two pigs may be used in tandem to save time and water. Sufficient cleaning is established when the water discharging after the pig becomes clear within one minute.

### 3.4 POST CLEANING PROCEDURE

- A. After successful completion of cleaning the main shall be tested, flushed and disinfected in accordance with applicable sections of these Specifications.

\*\*\* END OF SECTION \*\*\*

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## SECTION 15030

### PRESSURE AND LEAKAGE TESTS

#### **PART 1 - GENERAL**

##### 1.1 SCOPE OF WORK

- A. The CONTRACTOR shall test all piping, valves and appurtenances installed under these Contract Documents. Testing shall be performed concurrent with installation. Unless otherwise approved by the ENGINEER no more than 1,000 feet of pipe shall be installed without being tested.

##### 1.2 SUBMITTALS

- A. The CONTRACTOR shall prepare and submit to the ENGINEER schedules and procedures for testing of all parts of the water main installed in accordance with these Contract Documents. The schedule shall be submitted seven days prior to any testing.

#### **PART 2 - PRODUCTS**

##### 2.1 EQUIPMENT

- A. The pump, pipe connections, and all necessary apparatus for the pressure and leakage tests, except gauges and metering devices, shall be furnished by the CONTRACTOR. The OWNER will furnish gauges and metering devices for the tests, but the CONTRACTOR shall make all excavations and backfills, and furnish all necessary assistance for conducting the tests.

#### **PART 3 - EXECUTION**

##### 3.1 GENERAL

- A. The CONTRACTOR shall follow the hydrostatic testing method in accordance with ANSI/AWWA C600, Section 5.2 Hydrostatic Testing, and these specifications.
- B. Air shall be vented from all high points in the line. If required, Contractor shall provide a corporation stop in a saddle at these points to provide venting. All valves controlling the section to be tested shall be closed. A test pressure of 150 psi minimum, or 1-1/2 times the normal working pressure, whichever is greater, shall be applied and held for a period of 2 hours. Contractor shall provide the necessary pump and a calibrated container for measurement of make-up water required to replace leakage during this 2-hour period.

- C. Allowable leakage in the section during this test shall conform to the following method:

$$L = \frac{SD(P)^{1/2}}{148,000}$$

where:

- L = allowable leakage, in gallons per hour  
S = length of pipe tested (ft)  
D = nominal diameter of pipe, in inches  
P = average test pressure during test, in psig (gauge)

- D. All defective items discovered during the pressure test shall be repaired or replaced by the CONTRACTOR at no additional cost to the OWNER. Test shall be repeated after any repair until the system meets the above leakage requirement. The test will be witnessed by an OWNER representative and the ENGINEER.

### 3.2 FILLING AND TESTING

- A. Each segregated section of pipeline will be slowly filled with water ensuring that all air is expelled. Extreme care must be taken to ensure all air is expelled from the pipeline during the filling of pipe with water. The line shall stand full of water for twenty-four hours prior to testing to allow all air to escape. If necessary, tap the main at points of highest elevation so that air can be expelled as the pipe is filled with water. After successful completion of filling and air expulsion, but prior to testing, the corporation stops shall be removed and the taps tightly plugged.

\*\*\* END OF SECTION \*\*\*



## SECTION 15040

### HIGHLINING FOR WATER MAINS

#### **PART 1 - GENERAL**

##### 1.01 GENERAL

This section specifies highlining requirements for the existing potable water transmission and distribution system with a temporary water supply conveyance pipeline (highline system). Highlining shall be provided as specified herein and in accordance with Section 15000 Pipelines and General Provisions.

The CONTRACTOR shall provide the materials, equipment, labor, and services necessary to maintain potable water service at all times.

##### 1.02 DESIGN REQUIREMENTS

- A. The means and methods of providing and maintaining uninterrupted service shall be the sole responsibility of the CONTRACTOR. A Highlining Plan shall be submitted for each highline operation.
- B. The highline system shall provide continuous service until water mains are constructed, tested, and commissioned or the Work is accepted by the OWNER. Installation and removal shall be organized, scheduled, and performed to provide minimum disruption of water services.
- C. All materials shall be NSF 61 certified and sized to meet the water demands of the existing system.
- D. Highlines may be provided above-grade. Portions of the highline will be trenched and buried to avoid interference with vehicular or pedestrian travel or access.

##### 1.03 SUBMITTALS

- A. Working Drawings of Highlining Systems – Working drawings shall provide a detailed description and staging of highline systems to be provided. The plans must include the detailed locations of each connection and location of highline piping.
- B. Schedule – Submit a highlining schedule prior to the start of fabrication or assembly of any part of the highline system.

- C. Project Specific Highline Plan – The CONTRACTOR shall submit a separate plan for each separate set-up required. Plans shall be prepared and stamped by a Registered Professional Engineer in the State of California. Submit Working drawings, materials, staging and design calculations with supporting documentation and details for buried highline piping subject to live and dead loads.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

#### **A. Highline Systems**

- 1. The CONTRACTOR shall provide all pipe, valves, fittings, couplings adapters and ancillary materials required for a complete and operable highline system. Joints for all pipe shall be watertight.
  - a. The CONTRACTOR shall provide only products and materials which meet the specified requirements.
  - b. Products and materials shall be suitable for the intended purpose, free of defects, and recommended by the manufacturer for the application intended.
  - c. At the CONTRACTOR's option, highlining products and materials shall either be: a) New products and materials purchased for this Work, or b) Previously used and refurbished products and materials that have been used only in potable water service. Contractor shall submit a Letter of Certification as to the material use for potable water service only.
  - d. Products and materials provided shall be of current manufacture and shall be shop fabricated. Field fabrication of fittings shall not be permitted.
  - e. Provide bolted sleeve type transition coupling suitable for the pipe materials and diameters at connections to existing potable water mains. The coupling must be braced or restrained.
  - f. Isolation valves shall be installed on the temporary piping at connection points with the existing system.

#### **B. Highline Alignment**

1. The actual design of the highline system shall be prepared by the CONTRACTOR. The CONTRACTOR shall be responsible for routing piping and locating fittings and appurtenances. In general, piping shall be laid adjacent to the roadway along the curb gutter line.
2. Highline shall not be a tripping hazard for pedestrian traffic.

## 2.02 SAFETY BARRICADES

- A. Traffic safety barricades shall be provided in accordance with MUTCD where necessary for pedestrian and vehicular traffic.

## 2.03 TEMPORARY PAVEMENT

- A. Provide a temporary pavement patch to re-open the paved travel lanes when constructing buried Highlines. Provide a minimum of 4-inch hot mix bituminous temporary pavement. Cold mix temporary pavement shall not be used for temporary pavement.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. The highline system shall be flushed, hydrostatic tested for leaks, disinfected, and shall pass required bacteriological tests prior to being placed in service in accordance with ANSI/AWWA C651-14 Disinfecting Water Mains. All water sampling and bacteriological testing samples shall be taken by California-American Water Operations and testing shall be performed by a certified laboratory.
- B. The CONTRACTOR shall continually inspect and maintain the highline system during operation.
- C. The materials selected shall be adequate to operate at the specified pressure and adequate to withstand imposed forces, such as traffic loading or unbalanced thrust.

### 3.02 INSTALLATION

- A. The CONTRACTOR shall not commence installation of any part of the highline system without review of submittals and written authorization by the OWNER.
- B. The CONTRACTOR shall notify the OWNER, a minimum of 2 working days prior to commencing Work on highline set-up.

- C. Highline piping systems shall be installed and maintained such that they are neat, orderly, and leak-free, and shall be arranged to minimize interference with, or present a hazard to, normal usage of roads, shoulders, driveways, storm drains, drainage and other affected facilities.
- D. Excess materials and debris shall be removed from the project site daily.

### 3.03 ROADWAY CROSSING AND TRENCHING

- A. Wherever piping is required to cross a roadway, piping shall be routed below grade and the pipe materials and trench provided to withstand the in-service conditions including traffic loads. Trenching and backfill shall be performed in accordance with Section 02210 Trenching, Backfilling and Compacting and applicable AWWA standards for the piping materials provided. Trench backfill and temporary asphalt surface shall be tamped and compacted to provide a smooth, safe surface for the duration of the highlining installation.

### 3.04 RESTRAINT AND ROUTING

- A. Highline systems shall be restrained to prevent movement including, but not limited to, providing anchors, tethers and thrust blocks.

### 3.05 REMOVAL

- A. On completion of the Work, the CONTRACTOR shall:
  - 1. Drain the Highline in accordance with AWWA C655 and applicable sections of these Specifications.
  - 2. Dismantle the highline system by removing all pipe and appurtenances. Connections to existing potable water pipe shall be removed and pipes to be abandoned capped. Pipes installed in trenches shall be removed and trenches backfilled per Section 02210 Trenching, Backfilling and Compacting.
  - 3. Restore streets, curbs and gutters, cross gutters, landscape, irrigation, and other disturbed facilities.

\*\*\* END OF SECTION \*\*\*

## SECTION 15065

### DUCTILE-IRON PIPE AND FITTINGS

#### **PART 1 - GENERAL**

##### 1.1 SCOPE

- A. The CONTRACTOR shall furnish all labor, materials, tools and equipment required to install ductile-iron pipe and fittings, and related work as shown on the drawings and in accordance with the specifications.

##### 1.2 RELATED WORK

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK:

- |                  |                                |
|------------------|--------------------------------|
| 1. Division 1    | General Requirements           |
| 2. Division 2    | Site Work                      |
| 3. Section 03300 | Cast-in-Place Concrete         |
| 4. Section 15000 | Pipelines – General Provisions |
| 5. Section 15020 | Disinfecting Pipelines         |
| 6. Section 15030 | Pressure and Leakage Tests     |

##### 1.3 SUBMITTALS

- A. Submit to ENGINEER for approval, manufacturer's shop drawings, and technical information in accordance with the General Conditions and General Requirements.
- B. Submit Piping Layout Drawings showing all pipe, fittings, valves and appurtenance locations. Layout Drawings shall clearly show locations and sizes of thrust block and locations of pipe and fitting restraint devices and length of restraint.

##### 1.4 COORDINATION OF WORK

- A. Connection to existing pipelines may require shutdown of OWNER facilities. Construction work and connections shall be closely coordinated with the OWNER through the ENGINEER. The ENGINEER, in consult with the OWNER, may select the time, including Saturdays, Sundays, or holidays, which, in the opinion of the ENGINEER, will cause the least inconvenience to the OWNER and/or its customers, for connection to existing pipelines, and the CONTRACTOR will perform such connections at such times as may be

directed by the ENGINEER at the Contract prices and no claim for premium time or additional costs will be made by the CONTRACTOR.

- B. The location of the work will be on Right-Of-Way which is under active construction with multiple other contractors. CONTRACTOR shall review requirements of Section 01410 – Work Restrictions and follow requirements of that Section for coordination and access.

## **PART 2 - PRODUCTS**

### **2.1 PIPE**

- A. General: Ductile-Iron pipe shall conform to the latest specifications as adopted by the American National Standards Institute, Inc., (ANSI) and the American Water Works Association (AWWA). Specifically, all Ductile-Iron water pipe shall be designed in accordance with ANSI/AWWA C150/A21.50 Standard for Thickness Design of Ductile-Iron Pipe. Ductile-iron pipe shall be new and manufactured in accordance with ANSI/AWWA C151/A21.51 Standard for Ductile-Iron, Centrifugally Cast, for Water. Ductile-iron pipe shall be coated outside with a bituminous coating in accordance with ANSI/AWWA C151/A21.51.

Each length of pipe shall be subjected to a hydrostatic proof test as required by ANSI/AWWA C151/A21.51.

- B. Class: Ductile-iron pipe shall be minimum Thickness Class 50 or Pressure Class 350 below grade, and Thickness Class 52 above grade or as otherwise stated on the drawings.
- C. Lining: Ductile-Iron water pipe shall be cement-mortar lined and seal coated in accordance with ANSI/AWWA C104/A21.4 Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water. The lining shall comply with ANSI/NSF Standard 61.
- D. Corrosion Protection: Ductile-Iron water pipe shall be encased with one (1) layer of 8-mil linear low-density polyethylene film in accordance with ANSI/AWWA C105/A21.5 Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems. The film shall be pigmented with 2 to 2 ½ percent of well-dispersed carbon black with stabilizers. The polyethylene film supplied shall be clearly marked, at a minimum of every two feet along the ductile-iron water pipe length, containing the following information:
  - 1. Manufacturer's name or trademark
  - 2. Year of Manufacture
  - 3. ANSI/AWWA C105/A21.5

4. Minimum film thickness
5. Material type (LLDPE)
6. Applicable range of nominal pipe diameters sizes
7. Warning – Corrosion Protection – Repair any Damage

E. Joints:

1. Push-On: Push-on joints for ductile-iron pipe with manufacturer supplied styrene butadiene rubber gaskets and accessories in accordance with ANSI/AWWA C111/A21.11 Standard to Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. Flanged: When specified by the contract documents, flanged joints shall be in accordance with ANSI/AWWA C115/A21.15 Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

All flanged joints shall be furnished with 1/8-inch thick, red rubber or Styrene Butadiene Rubber (SBR) gaskets. The bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in American Standard for Wrench Head Bolts and Nuts and Wrench Openings (ANSI B18.2). For bolts of 1-3/4-inches in diameter and larger, bolt studs with a nut on each end are required. Material for bolts, washers and nuts shall conform to ASTM A307 Grade B zinc finish and shall be coated with bitumastic.

## 2.2 FITTINGS

A. General: Ductile-Iron fittings shall be new and manufactured in accordance with ANSI/AWWA C110/A21.10 Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 24 in. for Water Service in accordance with the contract documents. Compact ductile-iron fittings shall be new and manufactured in accordance with ANSI/AWWA C153/A21.5 Standard for Ductile-Iron Compact Fittings, 3 in. through 24 in. All Mechanical Joint fittings shall conform to ANSI/AWWA C153/A21.5. All Flange fittings shall conform to ANSI/AWWA C110/A21.10.

B. Class: Fittings shall be of the following pressures class (pound per square inch) listed below, unless otherwise noted:

<u>Size</u>	<u>Standard</u>	<u>Compact</u>
3" through 24"	350	350

C. Coating (Interior and Exterior): Ductile-Iron fittings shall be cement lined in accordance with ANSI/AWWA C153/A21.53 and ANSI/AWWA C110/A21.10.

Ductile-Iron fittings shall be bituminous coated on the outside, which shall be painted with Polyguard #14 mastic. The coating shall comply with ANSI/NSF Standard 61.

- D. Corrosion Protection: Ductile-Iron fittings shall be encased with one (1) layer of 8-mil linear low-density polyethylene film in accordance with ANSI/AWWA C105/A21.5 Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems. The film shall be pigmented with 2 to 2 ½ percent of well-dispersed carbon black with stabilizers. The polyethylene film supplied shall be clearly marked, at a minimum of every two feet along the ductile-iron water pipe length, containing the following information:

1. Manufacturer's name or trademark
2. Year of Manufacture
3. ANSI/AWWA C105/A21.5
4. Minimum film thickness
5. Material type (LLDPE)
6. Applicable range of nominal pipe diameters sizes
7. Warning – Corrosion Protection – Repair any Damage

E. Joints:

1. Mechanical Restrained: Mechanical joints for ductile-iron pipe with manufacturer supplied styrene butadiene rubber gaskets and accessories in accordance with ANSI/AWWA C111/A21.11 Standard to Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

All mechanical joints shall be restrained with the appropriate restraint series and accessories as manufactured by, EBAA Iron, Inc, or approved equal.

2. Flanged: When specified by the contract documents, flanged joints shall be in accordance with ANSI/AWWA C115/A21.15 Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

All flanged joints shall be furnished with a minimum 1/8-inch, thick red rubber or styrene butadiene rubber gasket. The bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in ANSI B18.2. For bolts of 1-3/4-inches in diameter and larger, bolt studs with a nut on each end are required. Material for bolts and nuts shall conform to ASTM A307 Grade B zinc finish and shall be coated with bitumastic.

## 2.3 MISCELLANEOUS

- A. Tracing Wire: All ductile-iron pipe and fittings shall be installed with a solid



No. 10 American Wire Gage soft copper insulated wire in accordance with the California American Water Standard Details.

- B. Concrete Thrust Blocking: Concrete thrust blocks shall be in accordance with details provided on the Drawings.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: The Contractor shall assume total responsibility for selecting the appropriate means and methods to install ductile-iron pipe, fittings and appurtenances in accordance with AWWA Standards, the contract documents and manufacturer recommendations while complying with OSHA Standards for construction. The provisions specified in Section 15000 shall be strictly followed in addition to the following requirements.
- B. Push-On Joints: The surfaces with which the rubber gasket comes in contact shall be thoroughly cleaned just prior to assembly. The gasket shall then be inserted into the groove in the bell. Before starting joint assembly, a liberal coating of pipe manufacturer lubricant shall be applied to the gasket and the spigot end. With the spigot end centered in the bell, the spigot end is pushed home in accordance with manufacturers recommendations.
- C. Restrained Mechanical Joints: All components shall be cleaned and lubricated with soapy water prior to assembly. Slip the follower gland and gasket over the pipe plain end making sure the small side of the gasket and lip of the gland face the bell socket. Insert the plain end into socket. Push gasket into position with fingers, gasket should be evenly seated. Slide gland into position, insert bolts and tighten must by hand. Bolts are then tightened alternately (across from one another) in accordance with manufacturers recommendations.
- D. Encountering Contaminated Soil: Research has documented that certain pipe materials (such as polyvinyl chloride, polyethylene, and polybutylene) and certain elastomers (such as those used in gasket material) may be subject to permeation by lower-molecular weight organic solvents or petroleum products. Products supplied under this section have been selected based on the non-expectation of encountering petroleum products or organic solvents.

If during the course of pipeline installation the CONTRACTOR identifies, or suspects, the presence of petroleum products or any unknown chemical substance, or a wastewater leach field, the ENGINEER is to be notified immediately. Installation of any further piping in the area of suspected contamination shall be stopped until direction is provided by the ENGINEER.

\*\*\* END OF SECTION \*\*\*

SECTION 15100  
VALVES GENERAL

**PART 1 - GENERAL**

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing general requirements for valves including epoxy coating, installing, adjusting, testing of valves and valve boxes above grade.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 15000 Pipelines and General Provisions
2. Section 15150 Gate Valves

1.3 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following standards apply to the WORK of this Section:

- |                      |  |
|----------------------|--|
| 1. ANSI B16.1        | Cast Iron Pipe Flanges and Flanged Fittings, Class 125 and 250                 |
| 2. ANSI B16.5        | Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys |
| 3. ANSI/ASME B1.20.1 | General Purpose Pipe Threads (Inch)  |
| 4. ANSI B16.42       | Pressure Class 150   |
| 5. ASTM A 126        | Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings    |
| 6. ASTM A320         | Specification for Alloy-Steel Bolting Materials for Low Temperature Service    |

- |     |                |  |
|-----|----------------|--|
| 7.  | ASTM D 3139    | Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals |
| 8.  | ASTM F 477     | Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe               |
| 9.  | ASTM A 536     | Specification for Ductile Iron Castings  |
| 10. | ANSI/AWWA C500 | Gate Valves for Water and Sewerage Systems   |
| 11. | ANSI/AWWA C504 | Rubber-Seated Butterfly Valves   |
| 12. | ANSI/AWWA C507 | Ball Valves 6 Inches Through 48 Inches   |
| 13. | AWWA C508      | Swing-Check Valves for Waterworks Service  |
| 14. | ANSI/AWWA C509 | Resilient-Seated Gate Valves for Water and Sewerage Systems                          |
| 15. | AWWA C550      | Protective Interior Coatings for Valves and Hydrants                                 |

#### 1.4 SHOP DRAWINGS AND SAMPLES

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

1. Manufacturer's product data including catalogue cuts.
2. Manufacturer's installation instructions.
3. Shop drawings showing details and dimensions.
4. Manufacturer's certification that products comply with the indicated requirements.
5. Schedule of valves indicating valve identification and location.
6. Manufacturer's certification that epoxy coatings have been factory tested and comply with the indicated requirements.

## 1.5 OWNER'S MANUAL

- A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:
1. Manufacturer's installation and operating instructions.
  2. Manufacturer's maintenance procedures.
  3. List of special tools.
  4. Schedule of valves indicating valve identification and location.

## 1.6 FACTORY TESTING

- A. General: Valves shall be tested in compliance with the AWWA Standards as indicated. Except as otherwise indicated, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.

## 1.7 FIELD TESTING

- A. Testing: Valves shall be field-tested for compliance with the indicated requirements.

## **PART 2 - PRODUCTS**

### 2.1 VALVES

- A. General: Shut-off valves, 6-inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes and covers containing position indicators, and valve extensions.
- B. Valve Flanges: Where the design pressure is 150 psi or less, flanges shall conform to either ANSI/AWWA C207 Class D, ANSI B16.1 125-lb class, or ANSI B16.5 150-lb class.
- C. Gate Valve Stems: Where dezincification is indicated, gate valve stems shall be fabricated with bronze conforming to ASTM B 62, containing not more than 5 percent of zinc nor more than 2 percent of aluminum. Gate valve stems shall be designed for minimum tensile strength of 60,000 psi, a minimum yield strength of 40,000 psi, and an elongation of at least 10 percent in 2 inches, as determined by a test coupon poured from the same ladle from which the valve stems are poured. Where dezincification is not indicated, bronze conforming to ASTM B 584 may be used.

- D. Protective Coating: Except where otherwise indicated, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves 4-inch and larger, and exterior surfaces of submerged valves, shall be fusion-bonded epoxy coated conforming to ANSI/AWWA C213 with a dry film thickness equal to 12 mils. **Flange faces of valves or pipes shall not be epoxy coated.**
- E. Valve Operators: Operators of the same type shall be furnished by the same manufacturer. Valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant.
- F. Nuts and Bolts: Unless otherwise indicated, bolts, nuts and washers shall be of Type 316 stainless steel conforming to ASTM A320 Grade B8M Class 2. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads. Bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.

The length of all bolts shall be such that after joints are made up, each bolt shall extend through the entire nut a minimum of 1/4-inch, but in no case more than 1/2-inch beyond the nut.

- G. Valve Flanges: All-thread studs may be used only on valve flange connections where space restrictions preclude the use of regular bolts.
- H. Castings: Castings shall conform to the requirements of ASTM A 48 unless otherwise indicated.

## 2.2 NAMEPLATES, TOOLS AND SPARE PARTS

- A. Nameplates: Except as otherwise indicated, a label shall be provided on all valves. The label shall be stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve.
- B. Spare Parts: Two sets of packings, O-rings, gaskets, discs, seats, and bushings shall be furnished with each valve, as applicable.

## PART 3 - EXECUTION

### 3.1 VALVE INSTALLATION

- A. General: Valves, operating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the manufacturer's installation instructions. Valves shall be independently supported to prevent stresses on the pipe.

- B. Access: Valves shall be installed to provide easy access for operation, removal, and maintenance and to prevent interferences between valve operators and structural members or any other obstructions.
- C. Valve Accessories: Where combinations of valves, sensors, switches, and controls are indicated, the combinations shall be properly assembled and installed to ensure that systems are compatible and operating properly.

\*\*\* END OF SECTION \*\*\*

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## SECTION 15150

### GATE VALVES

#### **PART 1 - GENERAL**

##### 1.1 WORK OF THIS SECTION

- A. The CONTRACTOR shall furnish all labor, materials, tools and equipment required to install gate valves with related work at the locations shown on the drawings and in accordance with the specifications.
- B. The WORK of this Section includes the installation of gate valves to the tapping sleeves and other various locations to provide isolation from the system as indicated, complete and operable, with all accessories specified herein.
- C. The gate valve shall be new and of current manufacture. All materials shall be suitable for the intended application in potable water. Materials not specified shall be a high-grade standard commercial quality, free from defects and imperfections that may affect the serviceability of the product for the purpose for which it is intended.

##### 1.2 RELATED WORK

- A. WORK of the following Section applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK
  - 1. Section 15000 Pipelines and General Provisions

##### 1.3 SUBMITTALS

- A. Submit to Engineer for approval, shop drawings, technical information on completed valve assembly including all options, appurtenances and cavitation report in accordance with the General Conditions and General Requirements.

#### **PART 2 - PRODUCTS**

##### 2.1 GENERAL

- A. Gate valves shall be furnished in accordance with the project plans, details and the specifications.
- B. Gate valves shall be installed on 12" diameter pipe or smaller.

## 2.2 MATERIALS

- A. Gate valves shall be new and manufactured in accordance with ANSI/AWWA C509 Standard for Resilient-Seated Gate Valves for Water Supply Service. Valves shall have a maximum working pressure rating of 250-psi. Valves shall be hydrostatically tested to at least 400-psi.
- B. Valves shall be non-rising stem, opened to the left (counter-clockwise) and provided with a 2-inch square operating nut.
- C. Stuffing boxes shall be o-ring seal type with a minimum of two (2) rings located in the stem above the thrust collar. Low friction tongue reduction thrust bearing shall be located both above and below the stem collar.
- D. Coatings: Interior and exterior exposed surfaces of the gate valve shall be coated with a fusion-bonded epoxy in accordance with ANSI/AWWA C550 Standard for Protective Epoxy Interior Coatings for Valves and Hydrants, and certified to ANSI/NSF Standard 61.
- E. Flanged joints shall be in accordance with ANSI/AWWA C115/A21.15 Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
- F. All flanged joints shall be furnished with a minimum 1/8-inch, thick red rubber or styrene butadiene rubber gasket. The bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in ANSI B18.2.
- G. Corrosion Protection: Gate valves shall be encased with one (1) layer of 8-mil linear low-density polyethylene film in accordance with ANSI/AWWA C105/A21.5 Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems. The film shall be pigmented with 2 to 2 ½ percent of well-dispersed carbon black with stabilizers. The polyethylene film supplied shall be clearly marked as follows:
  - 1. Manufacturer's name or trademark
  - 2. Year of Manufacture
  - 3. ANSI/AWWA C105/A21.5
  - 4. Minimum film thickness
  - 5. Material type (LLDPE)
  - 6. Applicable range of nominal pipe diameters sizes

7. Warning – Corrosion Protection – Repair any Damage

## 2.3 MANUFACTURERS

A. Gate valves shall be manufactured by one of the following (or equal) In addition to the above requirements, gate valves supplied to the project shall be:

1. Mueller Series A2360
2. U.S. Pipe Metroseal
3. Clow

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION

A. Installation requirements contained in Specification Section 15000 shall be strictly followed.

\*\*\* END OF SECTION \*\*\*

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**SECTION 15181**  
**FIRE HYDRANTS**  
**(Contractor Furnished)**

**PART 1: GENERAL**

**1.01 SCOPE**

Furnish all labor, material, tools, and equipment required to install fire hydrants at the location shown on the plans, or where designated by the Engineer.

**PART 2: PRODUCTS**

**2.01 MATERIAL**

- A. All fire hydrants shall be ductile iron and conform to the requirements of AWWA C503, traffic-model break-away type fire hydrants.
- B. Contact the local water district and obtain written fire hydrant mechanical details for the water district prior to ordering any fire hydrants for the Work. The number and sizes of hose nozzle outlets is dependent on the local regulation. (Most typical is two (2) bronze male threaded 2-1/2" hose outlet nozzles and one (1) bronze male threaded 4-1/2" pumper outlet nozzle with American National Fire Hose Connection Screw Threads (NH).) The hydrant shall be break-away traffic flange, 5-1/4" valve opening, 6" mechanical joint pipe connection. The hydrant interior and exterior shall be epoxy coated at the factory by the hydrant manufacturer in accordance with AWWA Standard C550 (6-8 mil average, 4 mil minimum). The Contractor shall contact the local water district and obtain written fire hydrant mechanical details for the water district prior to ordering any fire hydrants in accordance with the drawings
- D. All hydrant materials shall meet the requirements of NSF 61.
- E. Acceptable manufacturers and models, subject to the specifications set forth, include:
  - Jones Triton Model J4060BR, or approved equal

**PART 3: EXECUTION**

**3.01 INSPECTION PRIOR TO INSTALLATION**

- A. Contractor shall inspect all fire hydrants upon receipt. Cycle each hydrant to full open and full closed positions to ensure that no internal damage or breakage has occurred during shipment and handling. Check all external bolts for proper tightness.
- B. After inspection, close the hydrant valves and replace the outlet nozzle caps to prevent the entry of foreign matter. Protect stored hydrants from the weather/elements with the inlets facing downward.

**3.02 INSTALLATION**

- A. Locate hydrants on the plans or as directed by the Engineer and in compliance with local regulations. The location shall provide complete accessibility and minimize the possibility of damage from vehicles or injury to pedestrians. When placed behind the curb, the hydrant barrel shall be set so that no portion of the pumper or hose nozzle cap will be less than eighteen to twenty- four inches, depending on local requirements, from the gutter face of the curb. All hydrants shall stand plumb with the pumper nozzle facing the curb. Set hydrants with nozzles at least eighteen inches above the finished grade as shown on the plans. Set the break flange at least two but no more than six inches above finished grade, or as directed by the Engineer. Connect each hydrant to the main with a six inch branch connection controlled by an independent six inch gate valve, unless otherwise shown on the plans. All hydrants assemblies must be restrained from the hydrant back to the main.
- B. The Engineer may authorize hydrant protection using steel pipe bollards when hydrant installations have a greater than normal exposure to vehicular damage (e.g. parking lot installations, unusual driving situation, etc.). Install all such protection designated by the Engineer. Locate bollards as necessary adjacent to the hydrant and in such a manner as to not interfere with the ability to connect hoses or operate the hydrant as per detail drawing. Additionally, locate the bottom of the bollard and encasement above the hydrant supply piping and valve to prevent the possibility of damage to the piping should the bollard be displaced when hit. Payment for bollards shall be per the supplemental unit price schedule.
- C. Reaction or thrust blocking at the base of each hydrant must not obstruct the drainage outlet of the hydrant. The size and shape of concrete thrust backing and the number and size of tie rods, when required, shall be approved by the Engineer. Use the thrust blocking material specified in Specification Section 3300. See Specification Section 15000 for tie rod requirements.
- D. Contractor shall provide an impermeable cover, secured at the base, over out of service or newly installed hydrants marked "OUT OF SERVICE". This cover shall remain in place until the hydrant is placed in service.
- E. Contractor shall paint curb in front of fire hydrant in accordance with City of Bellflower Standards.

### **3.03 TESTING**

After installation and before backfilling (and after pressure testing the water main) test the hydrant as follows:

- A. Pressure Test
  - 1. Fill hydrant fully with water; close all outlets.
  - 2. Apply line pressure.
  - 3. Check for leakage at flanges, nozzles and operating stems.
  - 4. If leakage is noted, repair or replace components or complete hydrant until no leaks are evident.

- B. Paint all hydrant above the bury line in accordance with the local operations standards. Touch up paint (as specified by the OWNER under Special Conditions) shall be applied upon completion of installation as needed. Take extreme care to avoid getting any paint on any "O" rings or on the hydrant nozzles. Should paint be found on any "O" rings, the Contractor shall remove the paint and replace the "O" rings at his expense. Any paint on the hydrant nozzles shall be removed at the Contractor's expense.

**END OF SECTION**