

SECTION 01 41 28

PROTECTION OF EXISTING WATER AND AWSS FACILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Contractors performing excavation adjacent to or below the San Francisco Public Utilities Commission's (SFPUC) Potable Water (PW), Recycled Water (RW), and Auxiliary Water Supply System (AWSS) facilities to protect those facilities throughout the duration of their respective projects. Contractor will be held responsible for any damage related to or caused by failure to exercise due care. Repair of existing utilities and improvements damaged during construction shall be at the Contractor's expense.
- B. The Contractor shall perform all required work as stated in this specification section and as shown on the Drawing(s) and furnish all materials, other than those specified to be furnished by the City, which are necessary or required to complete the work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

(Not Used)

1.03 RECORD DRAWINGS AND STANDARDS

Records of the existing PW, RW, and AWSS facilities and Standard requirements are available for examination by bidders/awarded Contractor upon request by emailing cddengineering@sfwater.org.

Contractors are warned that changes which do not appear in the records for existing CDD facilities may have been made. The City makes no representation as to the completeness or accuracy of said records and assumes no responsibility thereto.

1.04 SUBMITTALS

Submit the following to City Representative for review and acceptance. Work shall not start until acceptance of submittals:

- A. Work plan, support details, and calculations.
 - 1. Work Plan for working around existing PW, RW, and AWSS facilities within the influence zone of the excavation. The plan shall show the locations of proposed facilities, existing utilities and pipelines, proposed pipe supports for SFPUC-CDD facilities, pipe storage, spoil bank,

excavation and pipe laying equipment, shoring system, and a description of how the work will proceed around the existing SFPUC-CDD facilities. Provide drawings that include dimensions to allow determining the distances of objects relative to the SFPUC-CDD facilities. Sizes of existing and proposed facilities, width and depth of proposed trench, and any other pertinent information must be shown in the drawings. For proposed structural facilities, such as retaining walls and tie back walls, potentially impacting CDD facilities, submit elevation and or section views showing horizontal and vertical locations of CDD facilities relative to the proposed structure.

2. Where supports are required per this specification, submit support details and calculations, signed and stamped by a California licensed Civil or Structural Engineer, for structural support for the protection of exposed and/or undermined sections of SFPUC-CDD pipe or facilities. At the discretion of SFPUC-CDD Engineering, revised support details and calculations may be required to be submitted if conditions vary significantly following excavation.
 3. Submit minimum twenty-one (21) calendar days before planned excavation.
- B. Control Density Fill (CDF) mix design where CDF is required per this Specification. Submit certified laboratory test results within the past 1-year that the mix proportions and materials comply with these Specifications.

PART 2 – PRODUCTS

2.01 CONTROLLED DENSITY FILL

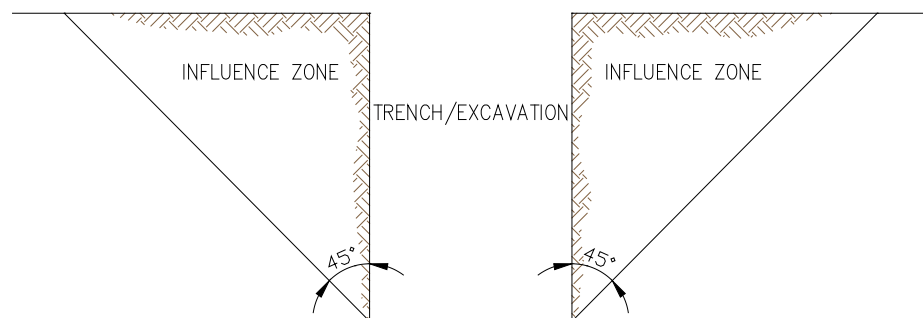
- A. Materials shall conform to the following.
1. Cement: ASTM C150, Type II or V.
 2. Aggregate: ASTM C33. Aggregate shall consist of fine aggregate with a maximum size of 1/4", free of clay, organics, and other deleterious materials. Less than 10 percent by weight shall pass the No. 200 sieve, and material passing the No. 40 sieve shall be non-plastic as determined in accordance with ASTM D4318.
 3. Water: Potable.
 4. Pozzolans: ASTM C618, Class C fly ash. Class F fly ash and slag is not permitted.

5. Air entraining: ASTM C260. Air content shall not exceed 25 percent.
 6. Admixtures: Shall not contain chloride ions and shall not cause delayed strength gain.
- B. Mixes:
1. Performance requirement: proportioned to be free-flowing, self-consolidating, hand tool excavatable, low-shrink slurry.
 2. Mix design requirement: The Contractor and its supplier shall determine the materials and proportions used to meet the requirements of the Specifications.
 3. Strength: Unconfined compressive strength at 28 days shall be less than 100 psi tested per ASTM D 4832.
 4. Flowability: 6 to 9 inches when tested per ASTM C-143 or ASTM D 6103.
 5. Cementitious Material: Portland Cement. Where pozzolans are used, pozzolans shall be limited to maximum 60% of the weight of cement.

PART 3 – EXECUTION

3.01 SUPPORT AND REPLACEMENT OF EXISTING PW, RW, AND AWSS FACILITIES WITHIN THE INFLUENCE ZONE

A. Inspection, Review and Approval of Methods



1. The influence zone is defined as the trench/excavation and the 45 degree soil wedge on the sides of the excavation as shown in the figure above. The Contractor shall contact CDD Engineering prior to doing any work inside the influence zone.

2. If existing SFPUC-CDD facility, not shown on the drawing or is shown on the drawing outside of the influence zone, is found to be within the influence zone, the Contractor is required to contact CDD Engineering and request an inspection to review and approve the field methods being used and/or proposed for the protection of CDD facility.
3. If two or more consecutive SFPUC-CDD lead filled, cast-iron pipe joints are located within the trench/excavation, CDD requires replacement of the existing pipe with new ductile iron pipe with elastomeric EPDM joint gaskets within the influence zone.
4. Existing valves exposed in trench/excavation:
 - a. If existing valve with lead filled joints is exposed within the trench/excavation, CDD requires replacement of the existing valve and cast-iron pipe with new ductile iron pipe with elastomeric EPDM joint gaskets within the influence zone.
 - b. If existing valve with restrained elastomeric gasketed joints connecting to ductile-iron pipe is exposed within trench/excavation, pipe support requirement shall be the same as that for ductile-iron pipe as specified in the following requirement. If valve is not restrained, restraints shall be added by CDD at the project owner's cost.
5. Pipe supports are required where CDD pipe is exposed more than:
 - a. 6 ft. for cast-iron pipe with no exposed joint.
 - b. 3.5 ft. for cast-iron pipe with exposed joint.
 - c. 10 ft. for ductile-iron pipe with no exposed joint.
 - d. 6 ft. for ductile iron pipe with exposed joint(s).
6. Sheet pile driving adjacent to existing CDD pipe shall maintain a minimum clear spacing between back of sheet pile and edge of pipe of:
 - a. 1.5 ft. for ductile iron pipes.
 - b. 4 ft. for cast-iron pipes. If within 4 ft., settlement monitoring is required for both LPW and AWSS lines. Settlement monitoring of LPW lines shall be the same as for AWSS lines unless approved otherwise by CDD Engineering.
7. Main disconnection/reconnection for PW and RW shall be performed by SFPUC-CDD. Pipe, valve, fittings, hydrants, and all necessary work not stated to be performed by SFPUC-CDD shall be performed by the Contractor. Excavation, backfilling, paving, traffic control, permitting, and any other support work necessary for the PW and RW replacement work including work to be performed by SFPUC-CDD shall be the Contractor's responsibility. All AWSS replacement work shall be performed by

Contractor or subcontractor qualified by CDD to perform AWSS main installation. All replacement valves and piping for CDD replacement is supplied by CDD.

8. Submit details and calculations for structural support for the protection of exposed and/or undermined sections of SFPUC-CDD facilities if required per this specification. Details and calculations shall be signed and stamped by a California licensed Civil or Structural Engineer. Structural supports shall be designed to protect (1) AWSS pipes constructed with Class H cast iron lead jointed pipe operating at 350 psi static pressure, (2) AWSS pipes constructed with Class 56 ductile iron pipe, (3) PW pipes constructed with Class B cast iron lead jointed pipe operating at 150 psi static pressure, and (4) PW or RW pipes constructed with Class 53 ductile iron pipe operating at 150 psi static pressure. Maximum deflection in pipe support members shall not exceed $L/500$, where L is the unsupported length of the member.

B. Restoration of Facilities

If project work exposes CDD facilities, the Contractor is required to

- 1) backfill and compact in compliance with San Francisco Department of Public Works (SFPDW) Street Excavation; and
- 2) perform soil compaction testing for backfill material placed within three (3) feet, horizontally or vertically, from the outside edge of a water facility, with all test results furnished to CDD Engineering.

For excavations that expose more than four (4) feet of CDD facilities or pipe joint (4-inch and smaller pipes are excluded), backfill is required to be constructed with control density fill (CDF) material.

CDF material shall begin at (3) feet below the CDD facility and continue up to the bottom of the CDD facility. CDF material shall not extend beyond the spring-line of any CDD facility. Width of CDF backfill shall be OD of CDD pipe + 1ft on each side. Compaction test must be performed on the backfill material below the CDD facility immediately before CDF placement.

END OF SECTION