



**CITY OF EAST PALO ALTO, CALIFORNIA
DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION**

ADDENDUM 3

**UNIVERSITY AVEUNE AND WEEKS STREET 12-INCH WATERMAIN PROJECT
PUBLIC WORKS PROJECT NO. WD-04**

To all prospective bidders, you are advised that the bid Documents for the above referenced Project are amended and clarified, as follows:

General Information and Questions

Question 1: I was sent from another party a specification for East Palo Alto specification for Fusion Bonded Epoxy, they said applies to Ductile Iron fittings. We are sure they are using the wrong standard. It appears in “General” and not referencing fittings. It also references an incorrect AWWA standard for fittings and uses one for Valves & Fittings.

- AWWA C213 Standard is specifically a Valve and Hydrant FBE standard.
- AWWA C116 standard is for FBE Fittings.

Answer: Per the updated specifications with this addendum, both ductile iron and steel may be used for couplings and fittings, depending on the specific product. Both materials would require a fusion bonded epoxy (FBE) coating. Use AWWA C213 for steel and AWWA C116 for ductile iron. Specification 33 14 13 Part 2-A.6 Fusion Epoxy Coating has been modified to make this distinction clearer.

Question 2: Can Recycled Aggregate Base and CL 1 Type A Permeable materials be used on these bidding projects?

Answer: Contractor shall submit bid in accordance with standard specification 31 23 33 Part 1.2 B Submittals.

Question 3: Can the water services be installed by trenchless bore / mole method on this project also?

Answer: Contractor shall submit bid in accordance with standard specification 33 14 13 Part 3.1 Piping Installation.

Specification: The updated Domestic Water specification are included on this addendum as well.

Ambrose Wong

Chin Hang (Ambrose) Wong
Special Projects Manager
City of East Palo Alto

ADDENDUM No.3, ACKNOWLEDGMENT

(To be submitted with the General Construction Contract, Attachment A of RFB)

**REQUEST FOR BID – UNIVERSITY AVEUNE AND WEEKS STREET 12-INCH
WATERMAIN PROJECT**

City Project: **WD-04**

Bidder acknowledges receipt of this addendum, which shall be attached to the bid. Acknowledgement of receipt of this addendum is required in the space provided below. Failure to acknowledge the addendum may subject the bidder to disqualification.

I, _____, representing _____ have
carefully read this addendum, understand it, acknowledge receipt of it and will comply with
its terms.

CONTRACTOR SIGNATURE

DATE

SECTION 33 14 13

DOMESTIC WATER

PART 1 – GENERAL

1.1 REFERENCE STANDARDS

- A. AWWA Standards, Latest Revision.
- B. AWWA M23 PVC Pipe Design and Installation Manual
- C. ANSI/AWWA C150/A21.50 Thickness Design of Ductile Iron Pipe
- D. AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances
- E. AWWA C651 Disinfecting Water Mains
- F. City of East Palo Alto (City) Standard Details.
- G. California Administrative Code, Title 22, §64572, Water Main Separation.
- H. National Fire Protection Association (NFPA) 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

1.2 WORK INCLUDED

- A. Section includes (but is not necessarily limited to):
 - 1. Furnishing and installation of low-pressure water pipe, valves, fittings and appurtenances.
 - 2. Installation of water services.
 - 3. Installation of fire service and fire hydrant laterals.
 - 4. Installation of fire hydrant assemblies.
- B. Comply with all other provisions of the Plans and these Specifications.

1.3 RELATED SECTIONS

- A. Section 31 23 33 - TRENCHING AND BACKFILLING

1.4 RESPONSIBILITY

- A. All underground fire piping system shall be installed in accordance with NFPA 24 and by an individual holding a Class A or C-16 State of California Contractor's license.

1.5 QUALITY ASSURANCE

- A. All disinfection and testing required by this Section and other Sections of these Specifications shall be in accordance with City requirements and witnessed by the City. Retesting required because of failed tests shall be at the expense of the Contractor.

- B. All materials and equipment furnished under this Section shall: (1) be of an American manufacturer who has been regularly engaged in the design and manufacture of the materials and equipment and (2) be demonstrated to the satisfaction of the City that the quality is equal to the materials and equipment made by those manufacturers specifically named herein, if an alternate product manufacturer is proposed.

1.6 EQUIPMENT

- A. Contractor shall ensure that all equipment used on this site is operated, inspected, and maintained in accordance with applicable Cal/OSHA standards.

1.7 SUBMITTALS

- A. Submit complete specifications, catalog information and cut sheets, descriptive drawings, and literature for each equipment item to be furnished under this Section, with all exceptions to the Specifications noted.

Provide submittals for:

1. Pipe, valves, fittings & appurtenances
2. Service pipe and fittings
3. Lug, tie rods and other devices for restraining pipe points
4. Meter box and cover
5. Valve box and cover
6. Valve operating nut extension (for deep valves)
7. Other materials or drawings necessary to complete the installation.
8. Disinfection schedule and procedures including:
 - a. "Normal" disinfection procedure.
 - b. Emergency disinfection procedure for mains and services which must be returned to service immediately.
 - c. Disinfection schedule including number and type of services and length of disruption of service.
 - d. Disinfecting agent(s).
 - e. Method of disposal of chlorinated water.

1.8 POTHOLING

- A. Do not begin any construction until potholing has been performed and existing utility locations have been confirmed. If interferences are found in any section of valve, fire hydrant or pipeline installation, do not begin construction for that valve, fire hydrant or section of pipeline until the installation location or pipeline alignment has been modified by the City Representative to eliminate all such interferences.

1.9 CONSTRUCTION SCHEDULING/SEQUENCING

- A. Construction includes expansion and/or modification of the existing water system which must continue to provide service to all customers during construction.

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- B. Connections and utility changes must be programmed to provide the least possible interruptions of service. Prior to any shutdown all materials, fittings, supports, equipment and tools shall be on the site and all necessary labor scheduled prior to starting any connection work. The Contractor shall notify the City in writing at least 7 days in advance of any required shutdowns so that affected customers may be notified. In general, shutdowns shall not exceed four hours in duration unless specifically authorized or indicated in the suggested construction sequence.
- C. All work shall be conducted in a manner which will minimize shutdowns, open roadways, or traffic obstructions caused by the construction. Shutdowns causing damage to adjacent public and private property shall not be permitted, and any damage resulting shall be the sole responsibility of the Contractor.
- D. Planned water service shutdowns shall be accomplished during periods of minimum use. In some cases, this will require night or weekend work. The Contractor shall program his work so that service will be restored in the minimum possible time and shall cooperate with the City in reducing shutdowns of the water system to a minimum. No water interruption will be permitted without the prior approval of the City. The Contractor shall notify residents and businesses at least 48 hours in advance of any required shutdowns.

PART 2 – PRODUCTS

A. GENERAL

- 1. Pipe and valve sizes are nominal inside diameter unless otherwise noted.
- 2. All materials delivered to the job site shall be new, free from defects, and marked to identify the material, class, and other appropriate data such as thickness for piping.
- 3. Acceptance of materials shall be subject to strength and quality testing in addition to inspection of the completed product. Acceptance of installed piping systems shall be based on inspection and leakage and bacteriological tests as specified hereinafter.
- 4. All fitting and valve joints shall be mechanical, flanged or flex (no push on joints allowed). All joints shall be restrained as indicated in these Specifications. Joints shall be fusion epoxy coated (exterior and interior).
- 5. Buried nuts and bolts for flanges and couplings shall be Type 316 stainless steel unless otherwise specified herein.
- 6. Fusion Epoxy Coating
 - a. Ductile Iron (Fittings Only): Materials and application shall be in accordance with AWWA C116.
 - b. Steel: Materials and application shall be in accordance with AWWA C213, except application shall be by the fluid bed method only unless the greatest dimension of the article to be coated exceeds 10 feet, in which case electrostatic spray method may be used.
- 7. All brass components in contact with potable water shall be composed of either CDA/UNS Brass Alloys C89520 or C89833 with a maximum lead content of 0.25% by weight in accordance with ANSI/AWWA C-800. Brass

alloys not listed in ANSI/AWWA C-800 Paragraph 4.1.2 are not approved. Brass saddles shall be composed of CDA/UNS C83600.

8. Fire Protection Piping and Fittings: All metallic pipe and fittings associated with fire protection shall be epoxy coated and polyethylene encased. All bolts, nuts, tie rods, ect for all portions of underground mains shall be 316 stainless steel. The transition from underground main to sprinkler riser shall have a dielectric flange connection.

2.2 PIPING MATERIALS

A. Pipe Designation:

1. New water mains shall be polyvinyl chloride (PVC) pipe or ductile iron pipe (DIP) as specified on the drawings.
2. Service connections between the water main and the water meter shall be copper.

B. Polyvinyl Chloride (PVC)

1. No fusible PVC pipe allowed.
2. Pipe: PVC Eagle Loc 900 or favorably reviewed equivalent pressure pipe, cast iron pipe outside dimensions. Pipe shall be UL listed or Factory Mutual Approved.
3. Pressure Class 235 psi (DR 18).
4. Joints:
 - a. All joints shall be internally restrained Eagle Loc 900 push on joints or favorably reviewed equivalent or restrained mechanical or flanged joints.
 - b. Restraint Coupling: Mechanical joints using ductile iron clamp-on restraining devices.
 - 1) Restraining devices: Ductile iron with ductile iron or cor-ten rods and bolts. Pressure rating of at least 200 psi. Series 1500 by EBAA Iron; equivalent by Uni-Flange; or equal for bell and spigot joints. Series 500 by EBAA Iron; equivalent by Uni-Flange; or equal for mechanical joints.
5. Gaskets: Styrene Butadiene Rubber (SBR). Submit two sample gaskets of each gasket type with an explanation of the markings.

C. Ductile Iron (DIP)

1. Pipe: Asphalt coated U.S. Pipe TR FLEX (or favorably reviewed equivalent) ductile iron, Pressure Class 350, ANSI/AWWA C151/A21.50 with cement mortar lining.
2. Joints: Pipe joints shall be restrained push on TR FLEX Restrained Joints or approved equal.
 - a. Gaskets: Rubber in accordance with ANSI/AWWA C111/A21.11
 - b. Restrained joints: Restrained pipe joints shall be U.S. Pipe's TR FLEX Pipe or favorably reviewed equivalent. Restraint of field cut pipe shall be provided with U.S. Pipe's TR FLEX GRIPPER® Ring, TR FLEX Pipe field weldments or approved equal.
3. Cement Mortar Lining: Standard thickness cement mortar lining per

- ANSI/AWWA C104/A21.4.
4. Field closure connections for restrained joints: Pipe cut in the field where necessary and when favorably reviewed by the Owner Representative shall be connected by one of the following methods:
 - a. TR FLEX Gripper Ring System by United States Pipe & Foundry Company.
 - b. Series 1100 Megalug mechanical joint restraint by EBAA Iron, Inc.
 - c. Favorably reviewed equivalent.
 5. Protection:
 - a. DIP polyethylene encasement, AWWA C105, black. Single wrap pipe. Double wrap flanged fittings, mechanical joints, or other appurtenances with significantly different outside diameters from the pipe. Tape to seal seams and overlaps shall be plastic adhesive tape at least 4 mils thick and at least 2 inches wide.
 - b. Provide external epoxy coating (12 mil thickness – minimum) on all DIP fittings.
 - c. DIP Asphalt Coating. Asphalt coating shall conform to ANSI/AWWA C151/A21.51 for pipe, AWWA C115 for flanged pipe and AWWA C110 and C153 for fittings.
- C. Copper Pipe:
1. Pipe: Copper (Cu), ASTM B-88-62, Type K.
 2. Joints: Compression.
- D. Schedule 80 PVC:
1. Pipe: ASTM D-1785 and listed by NSF for potable water applications.
 2. Fittings: ASTM D-1785, Cell Classification 12454B, Type 1, Grade 1.
 3. Joints: Solvent Welded, ASTM D-2564, and listed by NSF for potable water applications.

2.3 PIPE COUPLINGS AND FITTING

- A. General:
1. For typical pipe joints refer to pipe material specifications. Other joint devices shall be furnished where called for and as specified below.
 2. Handle fusion epoxy coated material with care. If material is damaged before installation, the Contractor shall repair or replace at the direction of the City Engineer.
 3. All pipe fitting joints including valves, bends, reducers, couplings, plugs and tees shall be restrained.
 4. All pipe fittings and restraint devices shall be listed by Underwriters Laboratories and approved by Factory Mutual.
 5. Follow pipe manufacturer specifications for buried vertical installations greater than 45 degrees.
- B. Fittings:
1. Restrained joint fittings and restrained components shall be ductile iron in accordance with applicable requirements of ANSI/AWWA C111/A21.111 and/or C153/A21.53 with the exceptions of the manufacturer's proprietary

- design dimensions.
- 2. All PVC pipe connections to fittings shall be restrained using 1100 Megalug Mechanical Joint Restraint or favorably reviewed equivalent.
- 3. Mechanical or flange connections or ductile iron clamp-on restraining harnesses:
 - a. Provide external epoxy coating (12 mil thickness – minimum) and 316 stainless steel bolt up kits including trim and sleeves for all fittings.
- C. Flexible Couplings and Flange Coupling Adaptors:
 - 1. Sleeve: Cast iron or fabricated steel.
 - 2. Followers: Cast iron, ductile iron, or steel.
 - 3. Sleeve bolts: ASTM A325, Type 3; 316 stainless steel; or equivalent.
 - 4. Coating: Fusion epoxy line and coat sleeve and followers.
 - 5. Pressure rating: 200 psi.
 - 6. Buried flexible coupling sleeve: Long barrel
 - 7. Manufacturers:
 - a. Flexible couplings:
 - 1) Connecting pipe with identical outside diameters: Smith-Blair 411 or 431, Dresser Style 38 or 53, or favorably reviewed equivalent.
 - 2) Connecting pipe with slightly different outside diameters: Smith- Blair 413 or R 441, Dresser Style 162, or favorably reviewed equivalent.
 - b. Flange coupling adaptors:
 - 1) Connecting new pipe or new pipe to existing non-ferrous pipe: Smith-Blair 912 or 913, Dresser Style 127 or 128, or favorably reviewed equivalent.
 - 2) Connecting new pipe to existing ferrous pipe: Insulating flange coupling adaptor with insulating boot: Smith-Blair 932 or 933, or favorably reviewed equivalent.
 - 8. Gaskets: Oil and grease resistant; Smith-Blair Grade 60; or favorably reviewed equivalent.
 - 9. Joint restraint: Provide joint harnesses (tie rod lug or attachment plate assemblies) across flexible couplings and flange coupling adaptors where indicated on the Drawings or City's Standard Drawings. For flanged coupling adaptors, anchor studs may be substituted for the harnesses on pipe up to 12-inch. Design restraint in accordance with AWWA M-11 for 200 psi if size of the rods are not indicated on the Drawings.
- D. Tapping Sleeves and Tapping Valves:
 - 1. All bolts must be tightened to the manufacturer's specifications. All bolts, nuts, and washers shall be epoxy coated (12 mil thickness – minimum) Type 316 stainless steel with anti-seize coating on threads. Contractor shall present City with all tapping coupons upon completion of tap. Coupons are to be tagged or marked as to location, date of tap and pipe size.
 - 2. Mueller tapping gate valves shall be as specified in Section 2.4 Valves and Accessories – Gate Valves.
 - 3. Valve box and riser pipe shall conform to details on the plans.

2.4 VALVES AND ACCESSORIES

A. General Requirements for Valves:

1. All valves shall be connected to pipe using restrained mechanical joints using EBAA Iron Series 1100 Megalug mechanical joint restraint or favorably reviewed equivalent.
2. All valves of each type shall be the product of one manufacturer.
3. All valves shall be of an American manufacturer.
4. All valves shall be furnished with control assembly, operators, handwheels, levers, or other suitable type wrench including handles as specified herein or as shown on the Drawings or City's Standards.
5. All threaded stem valves shall open by turning the valve stem counter-clockwise.
6. The exterior of all valves and valve operators shall be painted with two coats of Tape Coat Mastic; Protecto Wrap CA1180 Mastic; or favorably reviewed equivalent, except where otherwise indicated.
7. Provide bronze operating nuts, external epoxy coating (12 mil thickness – minimum), and 316 stainless steel bolt up kits for all valves.

B. Valves and Accessories:

1. Gate Valves:

- a. Rating: 250 psi water
 - b. Type: Resilient seated, non-rising stem, AWWA C509, as modified herein
 - c. Connection: Flanged or Mechanical joint.
 - d. Materials: Ductile iron body
 - e. Stem seal: O-ring
 - f. Finish: Fusion epoxy coated
 - g. Manufacturers: Mueller, American, Kennedy or City approved, or favorably reviewed equivalent.
 - h. Use on lines 12 inches or smaller.
2. Air Release Valve: APCO No. 55 or City favorably reviewed equivalent.
 3. All valves associated with fire service lines shall be an indicating type.
 4. Valve boxes: Per details on plans or City favorably reviewed equivalent.

2.5 SERVICE CONNECTIONS

A. General: All corporation stops, service clamps or saddles, and service connection accessories shall be the product of one (1) manufacture. All components shall meet the latest version of AWWA C800.

B. Service Saddles:

1. Rating: 200 psi water
2. Type:
 - a. For Polyvinyl Chloride pipe: Mueller series H-13000 c. IPS threads are not permitted on 1 inch service.
 - b. For Ductile Iron pipe: Bronze, double strap, Mueller BR 2 B, retained o-ring gasket, rolled strap threads, and tapping boss

with full length AWWA threads.

3. Manufacturer: Mueller Co. or City favorably reviewed equivalent.
- C. Corporation Stops:
 1. Rating: 300 psi water
 2. Type: AWWA thread inlet; compression connection outlet. IPS threads are not permitted on 1 inch service.
 3. Manufacturer: Mueller Co. or favorably reviewed equivalent.
- D. Angle Stops:
 1. Rating: 300 psi water
 2. Type: Compression inlet; Meter connection outlet. IPS threads are not permitted.
 3. Manufacturer: Mueller Co. or favorably reviewed equivalent.
- E. Meter Box:
 1. 1 inch Service - Christy B-16 with Christy FL16P-F reading lid labeled "WATER", or City favorably reviewed equivalent.
 2. 2-inch Service – Christy B-36 with FL36P-F reading lid labeled "WATER", or City approved equal, separate City approval required.
- F. Water Meter:
 1. Water meters shall be provided by the City.
- G. Locator Wire:
 1. Single length of #8 Blue Locator Wire. Coat at end of wire.
 2. Tracer wire is required for all underground fire lines and shall be a minimum of 10 A.W.G.

2.6 APPURTENANCES

- A. Provide all necessary assembly bolts, washers, and nuts, thrust blocks, supports, gaskets, flanges, and all other appurtenant items shown on the City's Standard Drawings, specified, or required for the proper installation and operation of the new water main, fire hydrants, and service connections.

PART 3 – EXECUTION

3.1 PIPING INSTALLATION

- A. General Handling and Placing:
 1. Exercise great care to prevent injury to or scoring of the pipe lining and coating, as applicable, during handling, transportation, or storage; 10% of pipe thickness maximum allowed. Handle fusion epoxy coated pipe in accordance with AWWA C213. Pipe shall not be stored on rough ground and rolling of the pipe on the coating will not be permitted. Contractor shall be responsible for the repair of any damaged pipe sections, specials, or fittings or replace at the direction of the City.
 2. Inspect each pipe fitting, valve, and accessories carefully before installation. Inspect the interior and exterior protective coatings and patch all damaged areas in the field or replaced at the direction of the City.

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3. Place or erect all piping to accurate line and grade and backfill, support, hang, or brace against movement as specified or shown within the Construction Documents and City's Standards, or as required for proper installation. Remove all dirt and foreign matter from the pipe interior prior to installation and thoroughly clean all joints before joining. All exposed pipe ends shall be covered and sealed with plastic, and shall not be uncovered until just prior to completing the joint.
4. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used. Use eccentric reducing fittings wherever necessary to provide free drainage of lines.
5. Connections between ferrous and non-ferrous piping and accessories shall be made using a dielectric coupling, union, or flange.

B. General Buried Piping Installation:

1. Trenching, bedding, and backfill for buried piping shall be as shown on the Drawings.
2. Where no grade elevations are shown on the Drawings, buried piping shall have at least 30 inches of cover.
3. Provide each pipe with a firm, uniform bearing for its full length in the trench except at field joints. Do not lay pipe in water or when trench conditions or weather are unsuitable for such work.
4. Protect buried piping against thrust by use of restrained joints and thrust blocks at all fittings and valves. Securely brace all exposed free pipe ends.
5. Do not pull bell and spigot, gasketed joints more than 75% of the maximum deflection permitted by the pipe manufacturer.
6. Service connections shall be installed by open trench method, or using trenchless technologies. This applies for service connections ONLY.

C. Water Main Installation:

1. DO NOT MAKE ANY CONNECTIONS BETWEEN THE NEW MAIN AND THE OLD MAIN UNTIL THE NEW MAIN HAS BEEN DISINFECTED AND TESTED AND THE CITY DIRECTS THAT CONNECTIONS CAN BE MADE.
2. The Contractor is advised that precautions taken to keep the pipeline clean during construction will facilitate achieving the disinfection requirements of this project with a minimum of effort and expense. Compliance with these suggested minimum procedures will not relieve the Contractor of the disinfection requirements.
3. Prior to installation, thoroughly clean the interior of each length of pipe and each fitting or valve and inspect to ensure that no foreign material remains. All exposed pipe ends shall be covered and sealed with plastic, and shall not be uncovered until just prior to completing the joint.
4. Pipe laying shall begin at the low end of the project and proceed uphill, as authorized by the City. Pipe bells shall face uphill.
5. Whenever pipe laying is discontinued for short periods, or whenever work stopped at the end of the day, close the open ends of the pipe with plugs or bulkheads.
6. Provide adequate trench pumping to ensure against groundwater contacting the inside of the pipeline at any time. Do not lower any pipe or fitting into

trench where groundwater is present and may enter the pipe. When necessary, pump the water from trenches and keep the trench dry until joints have been completed and the open ends of the pipe have been sealed with a watertight plug. Do not remove the plug until the trench has again been pumped dry.

7. Keep new pipe sections clean and dry.
8. When making the connection between a new pipeline and an existing or when repairing a damaged pipe, take the following extra precautions:
 - a. Clean the exterior of the existing pipeline of all dirt and debris, and spray or swab with a standard 5.25% or stronger chlorine solution (as specified) in the immediate vicinity of the work. Clean equipment and materials, including new pipe and fittings, to be used in making these connections of all dirt and debris and disinfect them. Allow at least 30 minutes' contact time for disinfection before the chlorine solution is diluted or rinsed off. Provide sufficient trench pumps to prevent flooding of the trench.
 - b. When an old line is opened, either by accident or by design, the excavation may be wet or badly contaminated from groundwater. Apply liberal quantities of standard chlorine solution or tablets to the open trench areas to lessen the danger from such pollution. Tablets are recommended because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation. Scatter liberally around and locate the tablets so that flow entering the work site will contact the disinfecting agent. Trench application should be done very carefully to avoid contact by skin and clothing with chlorine solution.
9. Water Department personnel must be present during hot tap and inspection of materials and installation. The location of hot tap to be verified by the Contractor to insure a minimum of 2 feet is kept from tap location and a bell end or end of pipe on a dead end.

E. Installation Specifics:

1. Polyvinyl Chloride Pipe: Installation shall conform to AWWA M23, Chapters 6 and 7.
2. Ductile Iron Pipe: Installation shall conform to ANSI/AWWA C150/A21.50 and AWWA C600.
3. Copper Pipe:
 - a. Bends shall be made in a manner that does not crimp or flatten pipe.
 - b. Dielectric unions shall be installed at connections with ferrous piping.
 - c. Pipe shall have joints squarely cut clean, properly fluxed and heated before solder is placed in the joint. Joints must be driven up tight before solder is added. Compression and flared joints shall be made up in accordance with the manufacturer's instructions.
4. Locator Wire:
 - a. Locator wire shall be installed on the outside of pipe between valve box and valve box riser. Hook wire over top of riser leaving 12 inches of slack within valve box and riser. Wire shall be loose over pipe joints and couplings. Wire shall be taped to top of main at approximate 3 feet intervals with 6 inch lengths of

1 inch wide filament tape (Scotch Brand No. 898 or approved equivalent). See City Standard Details for installation requirements – this detail applies to all new water main (both metallic and nonmetallic) regardless of pipe material.

3.2 FIRE HYDRANT INSTALLATION AND TESTING

- A. All fire hydrant installations shall have cathodic protection in accordance with City Standard Details.
- B. Install fire hydrants in accordance with City details, Menlo Park Fire District requirements, NFPA 24 and local water purveyor standards.
- C. Hydrants shall be installed with a minimum 6" diameter service lateral. Service lateral shall include a thrust block in accordance with City Standard Detail.
- D. Existing fire hydrant and fire service locations shall not be moved without written approval by the Menlo Park Fire District Fire Prevention Division.
- E. Install a blue reflective fire hydrant location marker on the nearest access road in accordance with Menlo Park Fire District standards.
- F. Fire hydrants, fire service lines and appurtenances shall be tested in accordance with NFPA 24 and Menlo Park Fire District testing procedure requirements.

3.3 COUPLING INSTALLATION

- A. Flexible Couplings and Flange Coupling Adaptors: Prior to installation, thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket. Care shall be taken that the gaskets are wiped clean before they are installed. If necessary, flexible couplings and flanged coupling adapter gaskets may be lubricated with soapy water or manufacturer's standard lubricant before installation on the pipe ends. Install in accordance with the manufacturer's recommendations. Bolts shall be tightened progressively, drawing up bolt on opposite sides a little at a time until all bolts have a uniform tightness. Workers tightening bolts shall be equipped with torque-limiting wrenches or other favorably reviewed type. Anchor studs on restrained flanged coupling adapters shall be installed to lock into holes drilled through pipe wall in accordance with manufacturer's recommendation.

3.4 INSTALLATION OF VALVES AND ACCESSORIES

- A. Wrap buried valve bodies as specified for flexible couplings and flanged coupling adapters.
- B. Use reducing fittings where any change in pipe size occurs between valves or accessories and the attached pipeline. Bushings shall not be used, unless Use eccentric reducing fittings wherever necessary to provide free drainage of lines. Inspect each piece of pipe and each fitting carefully to see that there is no defective workmanship on pipe, or obstructions in pipes and fittings.

3.5 INSTALLATION OF SERVICE LINES

- A. New water service laterals and connections shall be installed by the Contractor and replace existing water service laterals.

- B. Contractor shall install new water service connections up to the existing water meters as in accordance with City Standard Details.
- C. Contractor shall provide and install remaining water service line appurtenances.
- D. Contractor shall remove and dispose of existing water service laterals all other water service line appurtenances up to the effluent side of the water meter.
- E. Contractor shall preserve the existing water service connection at each existing water service lateral. Contractor shall make new water service connection and supply any fittings and piping necessary to properly connect new water service line to the existing water meters.

3.6 QUALITY CONTROL

- A. Factory Quality Control: The Contractor shall test all products as required herein and by the reference specifications.
- B. The Contractor shall:
 - a. Perform leakage tests.
 - b. Be responsible for the costs of additional inspection and retesting by the City resulting from non-compliance.
 - c. Perform bacteriological analysis for pipelines to be disinfected.
 - d. Perform flush and pressure test for fire hydrant and fire service lines in accordance with the Menlo Park Fire Protection District and NFPA 24 requirements. Fire hydrant and fire service line flush and tests shall be witnessed by Menlo Park Fire District Inspectors.
 - e. Submit a Menlo Park Fire District Plan Review Application and schedule inspections as required by the Menlo Park Fire Protection District.

3.7 CLEANING

- A. Prior to testing, the inside of each completed pipeline shall be thoroughly cleaned of all dirt, loose scale, sand, and other foreign material. Cleaning shall be by sweeping, flushing with water internal cleaning device or "pig", or blowing with compressed air, as appropriate for the size and type of pipe. Flushing shall achieve a velocity of at least 3 feet per second. The Contractor shall install temporary strainers, temporarily disconnect equipment, or take other appropriate measures to protect equipment while cleaning piping. Cleaning shall be completed after any repairs.
- B. The Contractor shall comply with the Municipal Regional Stormwater Permit (MRP) for discharge water.

3.8 FIELD TESTING

- A. General: Perform leakage tests on all pipe installed in this project. Furnish all equipment, material, personnel, test media and supplies to

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perform the tests and make all taps and other necessary temporary connections. The test pressure, allowable leakage and test medium shall be as specified. Perform leakage tests on all piping at a time agreed upon and in the presence of the City.

- B. Buried Piping: Perform the leakage test for buried piping after all pipe is installed and backfilled. However, preliminary tests may be conducted prior to backfill. If preliminary tests are conducted, provide any necessary temporary thrust restraint.
- C. Accessories: It is the responsibility of the Contractor to block off or remove equipment, valves, gauges, etc., which are not designed to withstand the full test pressure.
- D. Testing Apparatus: Provide pipe taps, nozzles, and connections as necessary in piping to permit testing, addition of test media, and draining lines and disposal of water, as is necessary. Plug these openings in a manner favorably reviewed by the Engineer after use. Provide all required temporary bulkheads.
- E. Correction of Defects: If leakage exceeds the allowable, repair or replace the installation and repeat leakage tests as necessary until conformance to the leakage test requirements specified herein have been fulfilled. All visible leaks shall be repaired even if the pipeline passes the allowable leakage test.
- F. Reports: Keep records of each piping test, including:
 - 1. Description and identification of piping tested.
 - 2. Test pressure.
 - 3. Date of test.
 - 4. Witnessing by Contractor and City.
 - 5. Test evaluation.
 - 6. Remarks, to include such items as:
 - a. Leaks (type, location).
 - b. Repairs made on leaks.
 - c. Submit test reports to the City.
- G. Venting: Where not shown on the Drawings, the Contractor may install corporation stops with saddles or "TEES" with shutoff valves at high points on piping to permit venting of air. Valves shall be capped after testing is completed.
- H. Testing Specifics:
 - 1. Water Transmission Mains:
 - a. Method: AWWA C600, as modified herein.
 - b. Duration: Two hours.
 - c. Pressure: Hydrostatic test equal to 200 psi.
 - d. Medium: Potable water.
 - e. Allowable Leakage: Leakage shall be defined as the quantity of test medium that must be added to the section of pipeline being tested to maintain the specified test pressure for the specified test duration.

Maximum allowable leakage shall be as specified in AWWA C600.

3.9 DISINFECTION OF POTABLE WATER SYSTEMS

- A. Disinfect all water mains and interconnected piping after testing and before being placed into service to ensure their bacteriological safety. Disinfection shall be accomplished under the supervision of the Contractor by a person skilled and experienced in the operation of water systems. Following disinfection and flushing, the Contractor will take water samples for bacteriological analysis of the water. If the specified bacteriological requirements are not satisfied, the disinfection procedure must be repeated until the requirements are met.
- B. Disinfect water mains, service laterals, fire service laterals, fire hydrants, and appurtenances in accordance with AWWA C651 as amended herein.
 - 1. Forms of Chlorine: Sodium hypochlorite or calcium hypochlorite.
 - 2. Method: Continuous-Feed.
- C. Chlorine Residual Testing: Latest version of AWWA C651, Appendix A, DPD Drop Dilution Method, except where otherwise specified.
- D. Bacteriological Analyses of Water: After the completion of disinfecting procedure, including the final flushing as described heretofore, the City Representative will obtain water samples from this system for bacteriological analyses. Requirements for satisfactory disinfection of water supply are that bacteriological analyses (Heterotrophic plate count) indicate that water samples are negative for coliformnerogenes organisms, and that total plate count is less than 100 bacteria per cubic centimeter. If bacteriological analyses do not satisfy the above requirements, then disinfection procedure must be repeated until these requirements are met.
- E. Disposal of Disinfection Solution: Dechlorinate and dispose of disinfection solution in accordance with applicable regulations. Take special measures to prevent chlorinated water from entering the ground, surface water, or sanitary sewer and storm drainage systems. Dechlorinate chlorinated water prior to discharge.

3.10 ABANDONMENT OF EXISTING WATERLINES AND APPURTENANCES

- A. Valves: Cut existing valves riser 12 inches (12") below surface and fill riser with concrete. Repair surface. See plans for details.

END OF SECTION