Cloud Preschool
CVWD Fire Utility Project

tBP Project No. 20778.15
Bid No: 194-19/20

Glendale Unified School District
Glendale, California

SPECIFICATIONS

Architect:
tBP/Architecture
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Architecture
Planning
Interiors
Management

TECHNICAL PROVISIONS

T-1 GENERAL

These Technical Provisions cover construction activities, installation, materials, and testing for the contract drawings entitled: **8-inch Water Main Installation on Cloud Ave. from Foothill Blvd. to Community Ave.** within Los Angeles County, California.

T-2 REFERENCES

In these Technical Provisions, the wording "Standard Specifications" refers to the latest edition of the Standard Specifications for Public Works Construction (SSPWC), also known as the "Green Book". Additional standards of the American Water Works Association (AWWA), American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), American Society of Mechanical Engineers (ASME), and American Welding Society (AMS) are incorporated by reference and form a part of these Technical Provisions. In any case of conflict, the requirements of this standard shall prevail. The following is a list of the standards used in these Technical Provisions:

ANSI B1.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ANSI B18.2.1	Square & Hex Bolts & Screws Inch Series
ASTM A283	Standard Spec for Low & Intermediate Tensile Strength Carbon Steel Plates
ASTM A307	Specification for Carbon Steel Externally Threaded Standard Fasteners
ASTM C31	Standard Method of Making and Curing Concrete Test Specimens in the Field
ASTM C39	Standard Test Method for Compressive Strength
ASTM C94	Standard Specifications for Ready-Mixed Concrete
ASTM C136	Standard test Method for Sieve Analysis of Fine and Course Grained Aggregates
ASTM C143	Standard Test Method for Slump of Portland Cement Concrete
ASTM C172	Standard Method of Sampling Freshly Mixed Concrete
ASTM C1064	Standard Test Method for Temperature of Freshly Mixed Concrete
ASTM D1557	Standard Test Method for Tensile Strength and Young's Modulus Fibers
AWS B2.1	Welding Procedure and Performance Qualification
AWS D1.1	Structural Welding Code - Steel
AWWA C200	Steel Water Pipe – 6 inch and Larger
AWWA C205	Std. for Cement-Mortar Protective Lining & Coating for Stl. Water Pipe 4" & Larger
AWWA C206	Standard for Field Welding of Steel Pipe
AWWA C207	Standard for Steel Pipe Flanges for Water Service Sizes 4 inch through 144 inch
AWWA C208	Standard for Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C210	Liquid-Epoxy Coating for the Interior and Exterior of Steel Water Pipeline
AWWA C218	Coating the Exterior of Aboveground Steel Water Pipelines and Fittings
AWWA C219	Bolted, Sleeve-Type Couplings for Plain End Pipe
AWWA C503	Standard for Wet-Barrel Fire Hydrants
AWWA C509	Standard for Resilient-Seated Gate Valves for Water and Sewerage Systems
AWWA C512	Air Release, Air/Vacuum and Combination Air Valves for Waterworks Services
AWWA C651	Standard for Disinfecting Water Mains
AWWA C901	Standard for Polyethylene (PE) Pressure Pipe and Tubing, 1/2 inch through 3 In inch for Water Services

T-3 EARTHWORK

A. General:

1) The Contractor shall perform all excavation, trenching, compaction, and backfilling necessary or required for the construction of the pipelines, service laterals, and appurtenances, as shown on the drawings. Excavations shall include the removal and **disposal** of all materials of whatever nature encountered, including all obstructions of every nature that would interfere with the proper construction and completion of the work. The Contractor will encounter rocks of various sizes within the trench and will be required to remove the material to an approved location.

2) The maximum length of open trench shall not be greater than two hundred (200) feet or the distance to accommodate the amount of pipe installed in a single day, whichever is less. The distance is the collective length at any location, including open excavation, appurtenance construction, pipe laying, backfill which has not been temporarily repaved, and necessary repairs to existing utilities that may have been damaged by the Contractor during construction of the pipeline.

3) The work shall also include all pumping, ditching, and other required measures for the removal or exclusion of water from all excavations. It shall be the responsibility of the Contractor to dispose of all water released from the District's mains, including, but not limited to water released as a result of valve leakage during system shutdown using best-management practices.

4) Filtration or retention in settling basin(s) shall treat surface runoff water containing mud, silt, or other deleterious material due to the construction of this project. The basin(s) shall be sufficient to prevent such material from migration into the storm drain system per Los Angeles County Department of Public Works permit requirements where applicable.

5) The Contractor shall be responsible for taking care of drainage water from the construction operations, storm water and wastewater from reaching the right of way from any source, so that no damage will be done to the trench, pipe, or other structures. The Contractor shall be responsible for any damage to persons or property on or off the right of way due to such drainage water, or to the interruption or diversion of such storm or wastewater on account of the Contractor's operations.

6) All earthwork including materials, excavation, and backfill will conform to SSPWC, Sections 5, 200, 209, 211, 300, 301, 302, 306, or any other relevant section.

B. Excavation:

1) All excavation work, including any required shoring or other provisions for worker protection, shall be performed in accordance with these Technical Provisions, the applicable provisions of Subsection 5-7 of the SSPWC, the "Construction Safety Orders" issued by the State of California Division of Industrial Safety, and the Los Angeles County Department of Public Works Excavation Permit.

2) Excavation for the pipelines, service laterals, and appurtenances shall be in open-cut trenches with vertical sides and shall be excavated to a depth of a minimum of four (4) inches below an established grade line based on the outside diameter of the pipe.

3) Should the contractor elect to tunnel or jack any portion of the pipeline, laterals, or other appurtenances, he shall first obtain approval from the School District, obtain any necessary permits, and pay any associated costs.

4) If it becomes necessary to excavate more than four (4) inches below the established grade line in order to remove rock, hardpan, shale, other interfering objects or due to Contractor error, the void shall be filled with pipe bedding material and compacted in accordance with SSPWC, Section 306-6.1 and these Technical Provisions Section T-3.C at no additional cost to the School District.

5) The Contractor shall sawcut the existing A.C. pavement or concrete. Pavement breakers or stompers **shall not be** allowed. Contractor shall vacuum or remove AC or concrete cuttings during the sawcutting operation and shall not be allowed to wash AC or concrete cuttings into the storm drain system per the Los Angeles County Department of Public Works permit requirements.

6) All native material excavated from the proposed pipe trench excavation shall become the property of the Contractor and shall be disposed of outside the limits of work in accordance with the applicable ordinances and regulations of governmental agencies having jurisdiction. Costs of said disposal shall be the sole responsibility of the Contractor and no additional compensation shall be made therefor. It shall be the responsibility of the Contractor to locate suitable disposal sites, and obtain permits or other required authorizations.

C. Pipe Bedding:

1) Pipe bedding shall be defined as that material supporting, surrounding, and extending from 4 inches below the bottom, to 12 inches above the top of pipe. Bedding material shall be sand, shall be free from clay and organic materials, and shall be of such particle size that 90-100% will pass a No. 4 sieve and not more than 5% will pass a No. 200 sieves performed in accordance with ASTM C136 and SSPWC, Section 306-6.1.

2) For pipe bedding material, a sample of pipe bedding material shall be submitted to the School District before construction. The School District will perform a sieve analysis in accordance with ASTM C136 to determine if the pipe bedding material meets the requirements defined above. If sample fails to meet requirements, the contractor shall re-submit a sample until requirements are met.

D. Backfill:

1) Backfill shall be considered as starting 12 inches above the pipe or conduit to the street subgrade or finished ground. Backfilling operations shall conform to the applicable provisions of SSPWC, Subsection 306-1.3 and Subsections 306-12

2) **Backfill material shall be imported Crushed Aggregate Base (CAB) or Processed Miscellaneous Base material (PMB), or Crushed Miscellaneous Base (CMB), or Class A Base** and contain no rocks or stones greater than two (2) inches in any dimension. Broken pavement or similar materials shall not be allowed for backfill. If at any time the contractor needs to change backfill distributors, the School District must be

notified

immediately for approval and re-testing prior to backfilling. Backfill material shall be imported and approved by the School District prior to placement of backfill

3) Slurry Backfill maybe required by the Los Angeles County Department of Public Works.

4) Backfill within the pipe trench shall be compacted to ninety-five percent (95%) of relative compaction from the bedding material to the street subgrade or finished ground. Hand-directed mechanical tamping or other similar approved methods shall be permitted when cover over the top of pipe is greater than twelve (12) inches. Subgrade preparation and operations shall conform to the applicable provisions of SSPWC, Subsection 301.

5) Backfill materials shall be compacted in maximum lift thickness of eight (8) inches. Use of equipment, which compacts by impact, vibration, or rolling, will not be permitted until cover over the pipe is in excess of twelve (12) inches. The depth of the compacted material on each side of the pipe shall be approximately the same during the entire backfilling operation.

6) The moisture content of the soil as determined by the required soil density shall be uniformly distributed throughout each layer. All backfill above the pipe bedding shall be mechanically compacted in accordance with SSPWC, Section 306-12

7) Compaction of trench backfill by ponding or jetting will be permitted when, as determined by the School District or the School District's representative, the backfill material is of such character that it will be self-draining when compacted and that foundation materials will not soften or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result. Ponding and jetting methods shall be conducted in accordance with SSPWC, Subsection 306-12.4.1. Water jetting may be supplemented by the use of vibratory or other compaction equipment when necessary to obtain the required compaction in accordance with SSPWC 306-12.3.

8) Where supports of any nature are used in the trench, said supports shall all be removed unless otherwise approved by the School District. Where tight sheeting is used, it shall be removed systematically as soon as practicable after backfilling by pulling alternate pieces along each side of trench, alternating also from one side of trench to the other.

9) All surplus excavated material not used in the compacted backfill of the pipe trench shall be disposed of by the Contractor at his own expense. It shall be the responsibility of the Contractor to locate such suitable disposal sites, and obtain permits or other required authorizations.

10) For backfill material, a sample of backfill material shall be submitted to the School District before construction. The School District will perform a sieve analysis in accordance with ASTM C136 to determine if the pipe backfill material meets the requirements defined above prior to any backfilling.

E. Compaction Testing:

1) Backfill within the pipe trench shall be compacted to ninety-five percent (95%) of relative compaction from the bedding material to the street subgrade or finished ground.

Compaction shall be measured relative to the ASTM D1557 laboratory maximum density and in accordance with SSPWC, Subsection 211-1.

2) **Compaction tests will be the responsibility of the School District.** A certified soil-testing laboratory will perform compaction tests. The School District shall determine the location and number of compaction tests required. Compaction tests shall be performed **every 300 linear feet of pipe and at every other lateral.** At each test location, one test shall be performed between the bedding material and the sub grade. Additional tests, as deemed necessary by the School District, shall be performed at no additional cost to School District.

3) **The Contractor shall supply samples of the CAB, PMB, Class A or CMB** to School District from the supplier a minimum of 24 hours prior to placement of backfill. If the contractor does not supply samples in a timely manner, then the material and any backfilling **will be rejected, and the Contractor will replace the** CAB/PMB/CMB/Class A at no additional cost to the School District.

4) The Contractor shall provide twenty-four (24) hour notices to School District prior to any compaction tests. Contractor shall make available equipment and manpower to assist the School District/School District's representative with compaction testing.

T-4 CONCRETE CONSTRUCTION

A. General: The Contractor shall perform all cement concrete work necessary to complete the project, including street, sidewalk, driveway, & curb replacement, thrust blocks, and miscellaneous concrete work. All concrete materials, placement, curing, & testing methods are to conform to SSPWC, Sections 200, 201, & 303.

B. Materials: Concrete shall conform to ASTM C94. Thrust block shall have a minimum 28-day compressive strength of 2000 PSI. Street, sidewalk, driveway, and curb pavement replacement and miscellaneous concrete work shall have a minimum of 28-day comprehensive strength of 3000 psi.

C. Placement:

1) Concrete shall be carefully deposited in such a manner as not to separate the ingredients. Concrete shall not be permitted to fall more than 6 feet without the use of pipes or tremies. Pours made in hot weather shall be given special protection to insure that concrete will not dry out too rapidly, both during and after placement.

2) Effective consolidation shall be obtained by vibration, agitation, spading, and rodding until the concrete is free from voids, air bubbles, or rock pockets. Vibrators shall not be used to transport concrete within the forms.

3) Contractor shall be responsible for repair and/or replacing any existing or new

concrete damaged by vandalism or construction activity. See Technical Provision Section T-5, Trench Resurfacing for additional requirements.

D. Curing: All concrete shall be adequately protected from injurious action by sun, wind or freezing for a period of 10 days after placement in accordance with curing methods of the SSPWC, Subsection 303-1.10.

E. Finishes: For street, sidewalk, driveway and curb pavement replacement, the Contractor shall match the existing concrete finish nearest to the concrete replacement. Contractor shall meet with the Los Angeles County Department of Public Works and Crescenta Valley Water District (CVWD) inspector 24-hours prior to placement of concrete to confirm type of finish. If finish does not adhere to the Los Angeles County Department of Public Works permit requirements, Contractor will replace that section of replacement concrete at no additional cost to the School District.

F. Testing: **Concrete testing will be the responsibility of the School District**. Concrete shall be sampled and tested in accordance with SSPWC, Subsection 201-1.1.5. Each batch of concrete shall be sampled according to ASTM C172, C143, and C1064 and a copy of the batch ticket submitted to the School District. One compressive strength test, ASTM C31, and C39 shall be performed for every 100 cubic yards of concrete placed.

T-5 TRENCH RESURFACING AND PAVEMENT REPLACEMENT

A. General: The Contractor shall reconstruct all asphaltic concrete (AC) pavement, concrete and dirt areas damaged or removed by the installation of the water system improvements. Trench resurfacing and replacement of AC and concrete pavement shall conform to SSPWC, Subsections 306-13, 314-1, 403-1, & 400 and Los Angeles County Department of Public Works Excavation Permit requirements where applicable.

B. Scope: Furnish materials, equipment and perform labor required to execute this work as specified and as necessary to complete the contract, including, but not limited to these major items:

Providing placement of traffic control including barricades, signs, flagmen, and safety devices as necessary to maintain safe traffic control in accord with the latest W.A.T.C.H. handbook Section T-9 and the latest edition of the California Manual on Uniform Traffic Control Devices M.U.T.C.D**.**

1) Placement of temporary asphaltic concrete (AC) pavement.

2) Removal and disposal of existing temporary AC pavement.

3) Preparing subgrade, sawcut trench edges and edges of excavations before placement of AC pavement or concrete pavement.

4) Placement, spreading, compacting and surfacing of AC pavement or concrete pavement per the Los Angeles County Department of Public Works Excavation Permit requirements (See Appendix A).

5) Adjusting all valve cans, sewer manholes, metal frames and covers to the grade of the finished pavement.

6) The job site must be clear and free of all loose asphaltic concrete or construction debris during and after construction by an approved method. See section SP-13.

7) All Portland cement concrete (PCC) and AC pavements, gutters, driveways, curbs, and sidewalks, excavated or damaged shall be removed between neat vertical cuts, of an approved type or in the case of curbs, gutters, and sidewalks, between vertical cuts made by acceptable methods at the nearest score marks beyond the damaged portion as required in each case by the Los Angeles County Department of Public Works, or School District.

8) All driveways, private roads, parking lots and other facilities not under the jurisdiction of a public authority, excavated or damaged by the Contractor, shall be reconstructed by the Contractor with the same kinds of materials as used in the original construction and to the same thickness and other applicable dimensions, as nearly as may be, in such manner as to restore the affected portions of all said driveways, parking lots and other facilities to a sound and serviceable condition satisfactory to the District; provided that the thickness of replaced concrete driveways shall be not less than 4 inches.

9) The improvements to be restored by the Contractor shall include all pavements and other classes of surfacing whether in main roadways, parking lots or in shoulders, all curbs, gutters, driveways, sidewalks, drainage structures, lighting standards, walls, fences and any other surface improvements removed or damaged by the Contractor in course of his operations under contract.

10) In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall cut back and rim the edges so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement, gutter, driveway, curb, or sidewalk. Damaged edges of pavement within street right-of-way or parking lot areas shall be trimmed back by saw cutting.

11) Wherever the cut line of the pavement is within 24 inches of the curb face or the gutter line, as the case may be, the pavement shall be removed to the curb face or gutter line and replaced in kind. Costs for additional pavement removal will be paid per the contract unit price.

12) Wherever sidewalks, parking lots, driveways, or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks, driveways, or private roads promptly after backfilling and shall maintain them in a satisfactory condition for the period of time fixed by the District and authorities having jurisdiction over the affected portions before proceeding with final restoration or, if no such period of time is so fixed, shall so maintain said temporary sidewalks, driveways, or private roads until the final restoration thereof is made.

C. Materials:

1) Materials shall conform to the requirements of the Los Angeles County Department of Public Works Excavation Permit requirements where applicable (See Appendix A).

2) AC Pavement shall be per the Los Angeles County Department of Public Works Permit

requirements and shall meet the requirements of Section 203-6 of the SSPWC. The viscosity grade of paving asphalt shall be AR4000. Los Angeles County Department of Public Works and Crescenta Valley Water District (CVWD) inspectors shall determine the exact proportions of aggregate and the amount of asphalt binder.

3) For bidding purposes, the Contractor shall assume the AC mix design and limits will be:

- 3/4" Base Course: Type B PG-64-10 from the bottom of the existing pavement section plus 1" to within 1-½" of the existing surface.
- 3/8" Surface Course: Type C2 PG-64-10 from the bottom of the base course to the top of the existing surface.
- 6"-8" AC Pavement Thickness

4) All paving equipment shall conform to the Los Angeles County Department of Public Works excavation permit requirements and Section 39-5 of the State of California Standard Specifications. Aggregate base for the pavement structural section shall be either Crushed Aggregate Base (CAB) or Crushed Miscellaneous Base (CMB) per Los Angeles County Department of Public Works excavation permit requirements.

D. Field Conditions: Trench width may vary greatly due to the excavation and removal of rocks. The bidder shall verify actual field conditions and carefully examine the site of the work contemplated. It will be assumed that the bidder has investigated, and is satisfied, as to the conditions to be encountered.

E. Requirements:

Temporary AC pavement resurfacing shall be minimum 2-inches thick and placed wherever excavation is made through pavement, sidewalk, or driveways. Contractor shall be required to install temporary AC pavement immediately after trench backfill is completed. Permanent resurfacing shall comply with Los Angeles County Department of Public Works Permit requirements where applicable.

Contractor shall schedule final trench resurfacing with two weeks after completion of final water main connection. Contractor shall schedule final 1-½" AC Surface Course within 24 hours of completing the Base Course.

F. Inspection: The Contractor shall notify the School District, Los Angeles County Department of Public Works and Crescenta Valley Water District (CVWD) minimum of 48 hours prior to starting work.

G. Method of Measurement: The actual area (square footage) of trench resurfaced will be the basis of measurement. Trenches intersecting the pipeline (primary) trench for service laterals and appurtenances shall be measured in lineal feet beginning at the join line formed at the pipeline trench. A final job walk should be scheduled with the School District prior to measuring actual area.

1) School District shall not compensate Contractor for pavement damage through fault of the Contractor's operation. These areas will be determined in the field by the inspector.

T-6 WATER MAIN MATERIALS, INSTALLATION, TESTING AND DISINFECTION:

A. General:

1) The water main to be installed under these specifications and contract drawings shall be steel pipe with cement mortar lined and cement mortar coated (CML & CMC) as specified on drawings, which utilizes a full circle weld on each joint except where indicated in the following sections or on the plans.

2) **The School District will furnish standard 40 and 20-foot lengths of 8-inch and 6-inch diameter CML & CMC steel pipe. (See Appendix B for material list)** The Contractor shall coordinate with the pipe manufacturer for the time and location of pipe delivery. School District will provide company name and contract person for the contractor. School District must approve the storage location for pipe at jobsite.

3) **The Contractor shall furnish all fittings and special sections of pipe.** All pipe, fittings, and specials furnished by the Contractor will require an affidavit of compliance with AWWA Standard C200.

4) **Contractor shall pothole each connection point** prior to the beginning of construction. The pot-holing of the connection shall include verifying the horizontal and vertical location of the proposed connection point and to verify the outside diameter of the existing pipe. The Contractor shall notify the School District in writing, if any discrepancies arise. The cost for potholing shall be included as part of Bid Sheet Item No. 3 for Steel Water Pipeline and appurtenant construction.

B. Standard Steel Water Pipe:

1) Steel water pipe furnished by the School District shall be nominal 8-inch or 6-inch diameter, cement mortar lined and cement mortar coated, where noted on the plans and per table below. Required hydrostatic testing of the pipe shall be conducted at the last point of loading before delivery to the School District.

2) Pipe Diameters: Pipe diameters specified by the District shall be in accordance with the following table:

Plan Call-Out	Outside Shell Dia.	Wall Thickness	Conc. Lining Thickness
8" CML & CMC	8.625"	10 ga.	1/4"
6" CML & CMC	6.625"	10 ga.	1/4"

C. Welded or Flanged Steel Water Pipe, Fitting and Special Sections:

1) **The Contractor shall supply welded or flanged steel pipe fittings and specials sections.** Welded or flanged steel pipe, fittings, and specials shall be fabricated of 10 gauge (0.1345 inch wall thickness), Grade D steel plate meeting ASTM A283/A283M specifications and fabricated according to AWWA Standard C200 except where noted on the plans. All outlets, 4-inch diameter and larger, shall be provided with reinforcing

designed for a minimum water working pressure of 225 psi or 1.5 times the working pressure. All welded steel pipe, fittings, and specials shall undergo required hydrostatic testing at the last point of loading before delivery to work site unless otherwise allowed by School District.

a) Fittings and Special Sections: shall be of equal strength to the adjoining steel pipe. Fittings and special sections shall be cement mortar lined and cement mortar coated in accordance with paragraphs T-6C (6) and (7) of these Technical Provisions, dimensions of fittings and specials shall conform to AWWA Standard C208 and shall be provided with bell ends for lap welding, except where noted on the plans.

b) Special Sections: Bends, crosses, tees, reducers, or other special sections as indicated on the contract drawings.

2) Unsymmetrical closure of the spigot into bell rings will be permitted by maintaining the normal one-fourth (1/4) inch joint space on one side of the joint and increasing the joint space to a maximum of three-fourth (3/4) inch on the opposite side.

3) Where a smaller length of curvature is required than can be accommodated by unsymmetrical closure, sections of pipe with beveled ends may be laid on curved alignment, unless fabricated bends are shown on the contract drawings.

4) The spigot end of angle or beveled pipe may have maximum bevel of five (5) degrees measured from a plane perpendicular to the pipe axis. Straight or beveled pipe sections of less than standard length for the purpose of laying pipe on a smaller radius of curvature than can be accommodated by standard pipe, or for the purpose of making closures, will be permitted.

5) Where deflection angles are indicated as greater than that which can be installed by a single joint as defined above, bends shall be constructed in accord with Technical Provision paragraph T-6C (2).

6) Flanges:

a) General: Materials, dimensions, and drilling of flanges for pipe and fittings shall be in accordance with standard Class D, 150-300 psi hub type**, slip-on flanges** and/or pre-fabricated and meet the requirements of AWWA Standard C207. Slip-on flanges shall be forged steel and shall be furnished with flat faces suitable for use with full-faced rubber gaskets. All pipe flanges shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise shown on the contract drawings. Attachment of the slip-on flanges to the pipe shall conform to the applicable requirements of AWWA Standard C207.

b) Flange Gaskets: Gaskets for flanged joints shall be full-face type, asbestos ring gasket. Gaskets for blind flanges shall cover the full face of the blind flange and shall be cemented to inside surface of blind flanges.

c) Flange Bolts: Flange bolts shall be carbon-steel and conform to AWWA Standard C207 and ASTM A307. Bolt heads shall be hexagonal, and nuts shall be cold-pressed, semi-finished, and hexagonal. Bolt and nut dimensions shall be in accordance with

ANSI B18.2.1. Bolts and nuts shall be threaded in accordance with ANSI B1.1.

d) Bonded Flanged Connections: The Contractor shall install a #6 insulated copper wire to bond between flanges. The Contractor shall remove existing coating as required from pipe to facilitate installation. Clean steel by wire brush method and grind to bright metal prior to welding. Install wires using the Exothermic Welding Process in accordance with Erico Eng. Spec. A160-A05. Coat each weld with a Royston "Handy Cap" No. 2 weld cover and restore pipe exterior coating per T-6 of the Technical Provisions.

7) Welding: All fabrication welding shall be done by welders qualified under Sec. IX, part A, of the ASME Boiler and Pressure Vessel Code or American Welding Society B2.1.

8) Shop Testing of Special Sections: Upon completion of the welding of special sections but before lining, each steel plate section shall be tested by nondestructive or hydrostatic methods as provided in AWWA Standard C200. Hydrostatic testing shall be conducted at a pressure not less than 225 psi or 1.5 times the working pressure.

9) Interior Linings: Cement mortar lining shall conform to requirements of AWWA C205. Cement mortar lining thickness shall be in accord with Technical Provision paragraph T-6B. Lining thickness tolerance shall be 1/16 inch to 1/18 inch of the specified thickness. An affidavit of compliance with AWWA Standard C205 for all pipe, fittings, and special sections will be required.

10) Exterior Coatings:

a) Cement Mortar Coating - The exterior surfaces of pipe, special sections, connections, and fittings shall be protected with cement-mortar in accordance with AWWA Standard C205, except as noted on the construction plans.

b) An affidavit of compliance with AWWA Standard C205 shall be required for the exterior coating of all pipe, special sections, connections, and fittings.

11) Field Mortaring of Interior Joints: A tight-fitting swab or squeegee shall be inserted in the joint end of the pipe to be joined. When ready to insert the spigot, the face of the cement mortar lining at the bell shall be coated with a sufficient amount of stiff cement mortar to fill the space between adjacent mortar linings of the two pipes to be joined. Immediately after joining the pipes, the swab or squeegee shall be drawn through the pipe to remove all excess mortar and expel it from the open pipe end.

General Sealant-79 (GS#79) may be used in place of mortaring interior joints and must be approved by the School District or School District's field inspector. See Appendix C for technical data and installation details.

12) Interior Joints: Inside joints shall be constructed in accord with AWWA Standard C205, Appendix A.

D Pipe Installation:

1) Potholing of Existing Facilities: Contractor shall pothole each connection point and utility crossing locations as shown on the construction drawing prior to the beginning of

construction.

a) The potholing of the connections shall include verifying the horizontal and vertical location of the proposed connection point and depth of existing utilities. In addition, verify the outside diameter of the existing pipe.

b) The potholing of existing utilities by contractor shall very depths from finished surface.

c) The Contractor shall notify the School District in writing, if any discrepancies arise, prior to construction.

2) Handling and Transporting Water Pipe:

a) The School District shall furnish the steel water pipe; however, the Contractor shall coordinate the time and location of delivery of the pipe from the pipe manufacturer to the jobsite.

b) The School District must approve the storage location for pipe at the jobsite.

c) During loading, transporting, and unloading, every precaution shall be taken to prevent damage to the pipe.

d) After application of exterior coating, the pipe shall be handled only by use of approved hooks on the ends, by fabric slings or other approved means.

i. Wire rope shall not be used unless encased in heavy rubber hose, and chain slings shall not be used in any case.

ii. Trucks and trailers used for transportation of pipe shall be provided with padded bolsters curved to fit the outside of the pipe.

iii. Padding sufficiently stiff and thick to prevent scoring of the exterior shall be used under the chains.

iv. The pipe shall be braced at both ends to prevent damage from excessive deformation during handling and delivery.

e) Cement mortar coated pipe shall not be placed directly on rough ground, but **shall be supported on sandbags** or in an approved manner to protect against injury to the coating at whatever location it is stored.

i. Rolling the pipe on the exterior surface will not be permitted, but the pipe may be rolled on sleepers in contact with the bare ends only of the pipe.

ii. Any pipe section that becomes damaged shall be repaired as directed by the School District

iii. If, in the School District's opinion, satisfactory repairs can be made;otherwise, it shall be replaced with an undamaged section of steel pipe, at the Contractor's expense.

f) Plastic end caps shall be securely fastened to pipe ends of completed pipe or special sections for protection of cement mortar lining, and maintained until installation. All pipe section shall be cleaned and rinsed with clean portable water before installation.

g) Contractor shall remove the exterior cement mortar coating by using methods that shall not damage the integrity of the interior coating. If the Contractor damages the interior coating of a section of pipe, the Contractor shall replace the entire section of pipe at no additional cost to the School District.

3) Pipe Welding:

a) Pipe Welding: Circumferential joints in steel pipe shall be welded by use of electric arc in such a manner as to insure a connection equally or surpassing the strength of adjacent pipe. Care shall be taken to prevent damaging of the mortar lining and coating. All field welding shall be done in accordance with the applicable requirements of AWWA Standard C206, entitled "Field Welding of Steel Water Pipe."

b) All shop and field welding, whether manual or by machine, shall be as specified herein. Welds to fabricate steel pipe shall be made in accordance with the requirements of the applicable reference specifications under which the pipe is fabricated as amended herein.

c) Welds specified herein, or shown on the drawings, shall conform to the contours shown on these drawings or indicated by standard welding symbols on such drawings. Welds, when tested, shall develop a tensile strength equal to that of adjoining parent metal.

d) Finished weld bead shall be centered in the seam, and the finished joints shall be reasonably smooth and free from depressions, cut edges, burrs, irregularities, and valleys. Each deposited layer of welded material shall be thoroughly wire brushed, and all slag, scale, and other loose material shall be removed before any additional weld metal is applied. Fillet welds shall have the full penetration into the corner of the fillet and shall be obtained with a minimum cutting back of the edge of the outside sheet. Fillet welds shall be of the size specified herein or

shown on the drawings, and in any case, shall have a thickness of not less than that of the thinnest member to be joined.

e) Welds considered by the School District to be deficient in quality, or made contrary to any mandatory provisions of these specifications, shall be removed by chipping or cutting and re-made.

f) Weld metals shall be removed throughout its depth to expose clean base metal, but in no case shall the chipping or cutting extend into the base metal beyond the depth of weld penetration.

g) Caulking of welds will not be permitted. Tack welds shall be removed if required by the School District.

h) Weld test specimens taken from materials fabricated for the work of these specifications shall be taken in accordance with the respective reference specifications under which the particular item is being fabricated. Said specimens shall be furnished to the School District or his inspector to enable the School District to ascertain that welds of the proper quality are being made. The furnishing of specimens in insufficient time so as to cause delay in the fabrication of materials shall not be cause for a time extension nor extra cost item to the contract.

i) The School District shall have the right to request and witness the making of weld test specimens by a welder when, in the opinion of the School District, a satisfactory weld is not being made. Specimens shall be furnished by the Contractor

and a weld of the type in question shall be made. The weld specimen shall then be submitted to a test laboratory approved by the School District and subject to the appropriate test to determine the character of the quality in question. The expense of said test shall not be borne by the Contractor.

j) If more than one test is to be performed, additional specimens shall be furnished by the Contractor as required. The requirements of this provision shall not be cause for a time extension nor extra cost item to the contract.

k) Qualifications for Welding Operators: Manual welders shall be qualified in accordance with the latest revision of Section IX of the ASME Boiler Construction Code entitled, "Welding Qualifications" or under the Standard Qualification Procedure of the American Welding Society.

l) All welding operators shall be qualified under paragraph U-69 of ASME Code for Unfired Pressure Vessels, or Paragraph W.451 of API-ASME Code for Standard Qualification Procedure of the American Welding Society.

m) Welding Filler Material**:** Electrodes for manual welding shall conform to the American Welding Society Standards. All welding electrodes shall be subject to the approval of the School District.

n) Welding Equipment: Contractor's equipment for welding and flame cutting shall be so designed and manufactured to permit qualified welding operators to follow the procedures and obtain the results described in these specifications.

4) Installation:

a) Water pipes in trenches shall be laid at a minimum depth of 36" from top of pipe to existing ground surface unless otherwise specified on construction drawings.

b) All water pipe installations and appurtenances shall be done in accordance with the applicable requirements of AWWA Standard C604, entitled "Installation of Buried Steel Water Pipe."

c) The pipe shall be laid on a prepared bed as defined in Technical Provisions Subsection T-3C. Under ordinary conditions of pipeline installation, the work shall be so scheduled that the bell end of the pipe faces in the direction of installation.

d) In placing pipe in the trench, the pipe shall be held by a sling at two (2) balancing points of the section. It shall not be dragged in the bottom of the trench or bumped, but shall be supported by the sling while being fitted into the adjacent pipe section.

e) The Contractor shall excavate bell holes in the trench as required for field welding and for wrapping exterior joints. The interior bell end of pipe shall have a bead of cement mortar applied before the joint is assembled.

f) After each joint is assembled, bare metal shall be recoated and repaired with cement mortar coating per Technical Provision T-6D(7).

g) At all times when the work of installing pipe is not in progress all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent entrance of animals and foreign materials. All foreign matter, which may have entered the pipe, shall be removed from each length of pipe before it is jointed in place.

h) The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the School District.

i) The Contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source. The Contractor shall assume full responsibility for any damage resulting from water entering the trench and shall at his own expense, restore and replace the pipe to its specified condition and grade if it is displaced due to floating.

5) Weld End Pipe for Field Welding:

a) Prior to placing the weld end into the bell of the previously laid water pipe, the weld end and plain end shall be thoroughly cleaned. At each joint, gaps in the cement mortar lining and in the cement-coating exterior shall be filled with the same material as that used for the pipe. If butt straps are used for joining pipe sections, butt strap materials and the School District or School District's Representative shall approve welding.

b) Weld End Joints - All joints for the water main shall receive full welds equally around the circumference of each joint.

c) Field welding shall be made by the electric arc process in conformance with applicable requirements of AWWA Standard C206 and the ANSI/AWS D1.1-Structure Welding Code for Steel. All hand welding shall be done by welders certified in accordance with ANSI/AWS D1.1. Qualification certificates for welders and welding operators shall be submitted to the School District.

d) The size of welding rod used, the number of passes, and the time interval between passes shall be carefully controlled to avoid damage to the cement-mortar lining. After welding, the surfaces near the welds shall be cleaned of all dirt, scale, or welding flux and provided with protective coating. Testing for joint leaks shall be performed in accord with Technical Provision Section T-6.

6) Joining New Main to Existing Main:

a) New mains shall be joined to existing mains as shown on the contract drawings. The time of making the connections shall be subject to approval of the School District.

b) If hot tapping is required, the tapping operation shall be performed by an experienced and competent firm. Only approved equipment shall be used so that recovery of the pipe coupon is assured.

c) After the tapping sleeve and gate valve have been installed and before the tap is made, the Contractor shall thoroughly clean and disinfect the interior surfaces of the tapping-sleeve outlet, the gate valve, and the appropriate parts of the tapping machine with a disinfectant solution containing not less than 200 parts per

million of available chlorine. All necessary safety precautions in the use of said solution shall be observed.

7) Shutoff of Existing Water Main or Service Laterals: The School District shall perform shutoff of existing water mains for connection of the new pipeline. Similarly, the School District shall perform shutoff of service laterals at water meter connections. The Contractor shall request the School District to perform shutdowns, **a minimum of seven (7) days in advance**. School District shall be responsible for notifying customers, a minimum of 48 hours in advance, of customers whose water shall be shutoff. Performance of shutoffs by the School District does not guarantee or imply an agreement to provide a complete, total stoppage of water flow.

8) Field Hydrostatic Tests:

a) Contractor shall furnish and install pressure testing bulkheads prior to the hydrostatic testing that will not allow the pipeline to move due to the thrust force of the pressure test. Contractor shall not be allowed to pressure test against **any gate valve or butterfly valve**. After successfully passing the pressure test and Bac-T test, the Contractor will remove the bulkheads and connect to the existing facilities.

b) **Before service laterals are connected to the pipeline**, Contractor shall hydrostatically test the water main in accordance with SSPWC Subsection 306-1.4.5. The pipeline to be tested shall be filled with water and shall be free from air. After the pipe has been completely filled, it shall be allowed to stand under a slight pressure for **a minimum of 24 hours** to allow the mortar lining to absorb water and to allow the escape of air.

c) The pressure test shall be conducted at 1.5 times its working pressure or 225 psi. Duration of each pressure test shall be at least four (4) hours. During the four (4) hours, the quantity of water required to maintain the test pressure shall be observed and recorded. No pressure loss or leakage shall be permitted.

d) **After connection of water services to the pipeline**, the Contractor shall hydrostatically test the main and laterals. The angle stops at the meters will be closed and the laterals and main tested for four (4) hours at 1.5 times its working pressure or 225 psi. If leakage or pressure loss occurs, the source of such losses shall be identified and repairs made as directed by the School District at the Contractor's expense.

e) The Contractor shall notify the School District a minimum of 48 hours before testing the pipeline. Should testing of any section of pipe or service lateral disclose leakage, the Contractor, at his own expense, shall perform all excavation necessary to locate and repair leaks or other defects which may develop under testing, including removal of backfill and AC pavement already placed. The Contractor shall replace such excavated material, and shall make all repairs necessary after which the test shall be repeated until the pipe meets test requirements.

f) All necessary apparatus for testing the pipeline shall be furnished by the Contractor. This item will be paid for as part of Bid Sheet Item No. 3 steel water pipeline and appurtenance construction. These unit prices shall constitute full compensation for all

materials, labor, equipment, tools, and incidentals needed to complete the work.

9) Disinfection of Water Mains:

a) The Contractor shall furnish all equipment, labor, and materials for the proper disinfection of all piping. All chlorinating and testing operations shall be done **after** hydrostatic testing and in the presence of the School District. The Contractor shall be responsible for any damage or contamination resulting from disinfection work including damage or contamination to the facilities constructed under this Contract or to facilities providing water for disinfection.

b) The Contractor shall be responsible for any injuries or liabilities arising out of failure to properly perform disinfection work. Pipeline disinfection shall be performed in accordance with AWWA Standard C651.

c) The form of chlorine to be used shall be gaseous chlorine, sodium hypochlorite, or calcium hypochlorite. Tablet, continuous feed, or slug method may be utilized. Following chlorination of the water main, the treated water shall be thoroughly flushed from the main and replaced with water from the District's mains until chlorine measurements show less than 1 mg/L total chlorine.

d) **Bacteriologic tests will be made by the Contractor** to demonstrate and record the sanitary condition of the pipeline. Two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected. Acceptable bacteriological conditions shall be:

1) absence of total Coliform
2) Absence of E. coli bacteria
3) A heterotrophic plate count of less than 500 colonies per 1 ml.

If acceptable bacteriological conditions are not found, re-chlorination shall be performed by the Contractor. Both chlorine concentration tests and bacteriologic tests will be at the expense of the Contractor. After successful completion of all disinfection procedures, including testing, the pipeline shall be placed in service, as directed by the School District.

10) Flushing Water Main and Dechlorination of Flushed Water: Following chlorination, all chlorinated water shall be thoroughly flushed from the pipeline. All chlorinated water from the pipeline shall be appropriately dechlorinated to less than 0.05 ppm total chlorine residual before entering any storm drain or other stormwater conveyance system.

11) Replacement of Existing Inoperable or Leaky Shutdown Valves:

a) As directed by the School District, the Contractor shall excavate and replace the existing peripheral shutdown valve(s) specified by the School District, which may be inoperable or leaky. Installation shall conform to CVWD Standard Drawing 60-30W.

b) **The School District shall furnish only gate valve(s).** The Contractor shall furnish couplings, tie-rods, slip on flanges, valve cans, valve caps, and any additional materials required. Temporary and permanent paving is

responsibility of Contractor and shall be paid for at unit price bid per SF per Bid Sheet Item No. 2.

c) The Contractor shall be responsible for notifying Underground Service Alert and the School District shall obtain excavation permit(s) from the proper agency.

d) All materials, labor, and equipment required for replacement of the existing shutdown valve(s) will be paid for at the additive unit price bid for each valve replacement, Bid Sheet Item No.8.

E. Valves:

1) Gate Valves:

a) **Resilient-seated gate valves shall be furnished by the School District** (See Appendix B for materials list). Gate valves shall be stored at 3730 Glenwood Avenue, La Crescenta for pickup by the Contractor.

b) Resilient-seated gate valves shall be flanged-end, counter clockwise opening with O-ring seals. The resilient-seated gate valves provided will conform to AWWA Standards C509, AWWA C515 and AWWA C550.

c) All exposed resilient-seated gate valves shall be installed a valve nut.

d) **The Contractor shall furnish all other materials** for valve installation such as slip-on weld flanges, gaskets, nuts and bolts per T-6 of the Technical Provisions.

e) Valve cans and risers shall conform to CVWD Standard Drawing 30-01W and be furnished and installed by Contractor.

2) Installation of Buried Valves:

a) Connect the valve to the water main, coat the flanges, apply polyethylene encasement, install bond flanged connections and place and compact the backfill to the height of the valve stem.

b) Place block pads under the extension pipe to maintain the valve box vertical during backfilling and repaving and to prevent the extension pipe from contacting the valve bonnet. Mount the upper slip pipe of the extension in mid- position and secure with backfill around the extension pipe.

c) Wrap buried valves in one layer of polyethylene conforming to AWWA C105, 8-mils in thickness each. Pass the one sheet of polyethylene under the valve and the coated flanges or joints with the connecting pipe and draw the sheet around the valve body, the valve bonnet, and the connecting pipe. Secure the sheet with plastic adhesive tape about the valve stem below the operating nut and about the barrel of the connecting pipe to prevent the entrance of soil. Fold overlaps twice and tape. Backfill the valve with care to avoid damaging the polyethylene.

3) Valve Leakage Testing: Test valves for leakage at the same time that the connecting pipelines are tested. See Section T-6 for pressure testing requirements. Protect or isolate any parts of valves or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any valves and retest.

4) Valve Field Testing:

a) Operate manual valves through 10 full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. If valves stick or bind, repair or replace the valve and repeat the tests.

b) Gear actuator valves shall operate from full open to full close through 10 cycles without binding or sticking.

c) The pull required to operate valves shall not exceed 80 pounds. The torque required to operate valves having 2-AWWA nuts shall not exceed 150 ft-lbs. If actuators stick, or bind or if pulling forces and torques exceed the values stated previously, repair or replace the actuators and repeat the tests.

d) Operators shall be fully lubricated in accordance with the manufacturer's recommendations prior to operating.

F. Flexible Couplings and Transition Couplings:

1) General: All flexible couplings (including transition, reducing, etc.) and coupling adapters (including flange couplings, etc.) which are used in the work shall be designed for not less than the same water working pressure as the water main to which they connect. All flanges, bells, sleeves, etc., shall be of the same pressure class and appropriate size and shape as the water main or fitting to which they connect. Sleeves shall have tapered ends to facilitate entry of the connecting pipe.

2) Flanges: Flanges shall be flat faced. All appropriate gaskets, rubber rings and other minor items recommended by the manufacturer for proper assembly and operation of the flexible couplings and coupling adapters shall be included.

3) Exterior Coating: A 10 mil or thicker even coat of holiday free, high impact, nonshattering, high adhesion, tasteless, odorless, non-toxic epoxy resin shall be applied on all surfaces of flexible couplings and coupling adapters, according to manufacturer's instructions, after irregularities, burrs and grease have been removed and immediately after sandblasting to white metal, followed by air blowing to remove dirt. The epoxy resin shall be either "Scotchcote No. 302" or "Keysite 740" or an approved equivalent recognized as accepatable in the waterworks industry.

4) Interior Coating: Flexible couplings and coupling adapters shall be protected when installed underground with cement mortar or protection as indicated on Plans. In general, flexible couplings and coupling adapters manufactured by following companies are acceptable: "Romac", "Dresser", or approved equal.

G. Fire Hydrants:

1) The Contractor shall install 6"x 4"x 2½" hydrant heads and fire hydrant laterals in accord with the contract drawings & CVWD Standard Drawing 50-02W or 50-03W.

2) **The School District shall supply the following materials: 6-inch CML & CMC steel pipe, 8" x 6" flanged tee, 6-inch gate valves, 8-inch - 6-hole 125-lbs. slip on weld flange, 6-inch CML & CMC 90º elbow, and 6"x 4"x 2½" Hydrant Head, (See**

Appendix B for materials list).

3) The Contractor shall furnish all other fire hydrant components per CVWD Standard Drawing 50-02W or 50-03W. All fire hydrant installation materials shall conform to AWWA Standard C503.

4) Restoration of Landscaping and Hardscape Areas: The Contractor shall remove and replant the existing landscape areas where fire hydrants are installed with plant material that matches the existing condition. Prior to construction, the Contractor is to take plant samples from the existing areas to obtain the same plant species at the end of fire hydrant installation. Contractor to install the plant material and add organic amendment and fertilizer so as to insure the survivability of the plant material.

T-7 WATER SERVICE AND BLOW-OFF LATERALS

1) The Contractor shall furnish, install, and connect water services in accordance with the contract drawings and CVWD standard drawings. In addition, Contractor shall remove existing meter boxes and install new meter boxes except as noted on plans. **The School District will furnish new meter boxes** (See Appendix B for materials list).

2) The Contractor shall be responsible for providing all materials for the construction of 1-inch water service laterals from the proposed main up to and including the angle stop per CVWD STD 10-00W & 10-01W, and reconnect to the existing meter.

3) Blow off assembly shall be installed per CVWD STD drawing 20-03W.

4) Water services 1-1/2" and larger shall be installed per CVWD STD drawing_____

5) Laterals shall be placed at a minimum of 2 feet depth below grade or as indicated on plans.

6) Should the Contractor elect to use tunnel or jacking techniques for service lateral installation, he shall first obtain approval from the School District and comply with California Government Code 4216.

B. Materials:

1) 1-inch and ¾-inch water service laterals shall be polyethylene (PE) pipe material as manufactured by Drisco or equal pipe, PE 2406 or PE 3408 Class 200. All PE piping shall be furnished by the Contractor and will meet the requirements of AWWA Standard C901 and be furnished with an affidavit of compliance from the manufacturer.

2) Angle stops, corporation stops, black weld couplings, and all other materials shall be furnished by Contractor (except meter boxes) per CVWD STD 10-00W and 10-01W and shall meet all AWWA requirements.

3) Blow off assembly laterals shall be brass pipe material as manufactured by Mueller Company, supplied in a low lead version or equal pipe, NSF/ANSI 61. All Brass piping shall be furnished by the Contractor and will meet the requirements of AWWA Standard C800 and be furnished with an affidavit of compliance from the manufacturer.

C. Storage: Polyethylene (PE) pipe shall be stored and handled in accordance with the manufacturer's recommendations, thereby avoiding damage due to crushing, piercing, excessive heat, harmful chemicals, or exposure to sunlight. If pipe is excessively pierced (to a depth greater than 10 percent of its wall thickness) or kinked, the damaged portion should be removed, discarded, and replaced by the Contractor at no additional cost to the School District.

D. Installation:

1) Bends in PE pipe shall not be permitted to occur closer than 10 pipe diameters from any fitting or valve. The recommended minimum radius of curvature is 30 pipe diameters or the coil radius when bending with the coil. Any bending of coiled pipe against the coil should not go beyond straight.

2) PE pipe which is pierced to a depth greater than 10 percent of the pipe wall thickness due to contact with rocks, sharp edges or other objects will be replaced with undamaged pipe and reinstalled by the Contractor at no additional cost to the School District.

E. Detectable Tracer Wire for Plastic Laterals:

1) Detectable underground tracer wire shall be installed for **all** plastic laterals. The detectable wire used shall be size 12 AWG, strand solid BC wall 019 as manufactured by ATLAS wire & cable. The detectable wire shall be buried in the excavation ditch 6-inches to 12-inches below grade and detectable using any common metal detector and expose the wire a minimum of 6 inches above the ground within the meter box.

2) An end of the wire shall be spot welded on the bare metal of the water main. Connection to water main shall be tape wrapped after tracer wire is installed.

F. Restoration of Landscaping, Irrigation Lines and Hardscape Areas:

1) The Contractor shall remove and replant existing landscape areas with plant material that matches the existing condition. Prior to construction, the Contractor shall take plant samples from the existing areas to obtain the same plant species at the end of lateral installation. Contractor to install the plant material and add organic amendment and fertilizer so as to insure the survivability of the plant material to the satisfaction of the School District and/or the School District's Representative and at no additional cost to

the School District. Contractor shall repair any irrigation system damaged or removed during construction to the satisfaction of the School District and/or the School District's Representative and at no additional cost to the School District.

2) Contractor shall replace any existing hardscape areas around the existing meter boxes including, but not limited to concrete, bricks, or special pavers in-kind to the satisfaction of the School District and/or the School District's Representative and at no additional cost to the School District.

T-8 SAMPLE STATIONS

A. General:

1) The Contractor shall furnish, install, and connect sample station assemblies in accordance with the contract drawings and CVWD standard drawings. In addition, Contractor shall remove existing sample station boxes and install new sample station boxes except as noted on plans. **The School District will furnish new sample station boxes** (See Appendix B for materials list).

2) The Contractor shall be responsible for providing materials for the construction of 1-inch sample station service laterals from the proposed main up to and including the sampling station and aluminum housing per CVWD STD 70-01W.

3) Laterals shall be placed at a minimum of 2 feet depth below grade or as indicated on plans.

4) Should the Contractor elect to use tunnel or jacking techniques for service lateral installation, he shall first obtain approval from the School District and comply with California Government Code 4216.

B. Materials:

1) 1-inch sample station service laterals shall be polyethylene (PE) pipe material as manufactured by Drisco or equal pipe, PE 2406 or PE 3408 Class 200. All PE piping shall be furnished by the Contractor and will meet the requirements of AWWA Standard C901 and be furnished with an affidavit of compliance from the manufacturer.

2) Ball Valves, corporation stops, black weld couplings, and all other materials shall be furnished by Contractor (including aluminum housing boxes) per CVWD STD 70-01W and shall meet all AWWA requirements.

C. Storage: Polyethylene (PE) pipe shall be stored and handled in accordance with the manufacturer's recommendations, thereby avoiding damage due to crushing, piercing, excessive heat, harmful chemicals, or exposure to sunlight. If pipe is excessively pierced (to a depth

greater than 10 percent of its wall thickness) or kinked, the damaged portion should be removed, discarded, and replaced by the Contractor at no additional cost to the School District.

D. Installation:

1) Bends in PE pipe shall not be permitted to occur closer than 10 pipe diameters from any fitting or valve. The recommended minimum radius of curvature is 30 pipe diameters or the coil radius when bending with the coil. Any bending of coiled pipe against the coil should not go beyond straight.

2) PE pipe which is pierced to a depth greater than 10 percent of the pipe wall thickness due to contact with rocks, sharp edges or other objects will be replaced with undamaged pipe and reinstalled by the Contractor at no additional cost to the School District.

E. Restoration of Landscaping, Irrigation Lines and Hardscape Areas:

1) The Contractor shall remove and replant existing landscape areas with plant material that matches the existing condition. Prior to construction, the Contractor shall take plant samples from the existing areas to obtain the same plant species at the end of lateral installation. Contractor to install the plant material and add organic amendment and fertilizer so as to insure the survivability of the plant material to the satisfaction of the School District and/or the School District's Representative and at no additional cost to the School District.

2) Contractor shall repair any irrigation system damaged or removed during construction to the satisfaction of the School District and/or the School District's Representative and at no additional cost to the School District.

3) Contractor shall replace any existing hardscape areas around the existing meter boxes including, but not limited to concrete, bricks, or special pavers in-kind to the satisfaction of the School District and/or the School District's Representative and at no additional cost to the School District.

T-9 TRAFFIC CONTROL

A. Traffic Control General:

1) The Contractor shall provide traffic control and access for Cloud Avenue, between Foothill Blvd and Community Ave., in accordance with the Work Area Traffic Control Handbook (W.A.T.C.H.), Manual on Uniform Traffic Control Devices (M.U.T.C.D.) latest editions and Los Angeles County Department of Public Works permit requirements.

2) The Work Area Traffic Control Handbook (W.A.T.C.H.) and the California Manual on Uniform Traffic Control Devices (M.U.T.C.D.) shall not relieve the Contractor of the responsibility of jobsite conditions during the course of construction or maintenance work, including safety of all persons, vehicles, and property

3) If the Contractor elects to prepare his own traffic control plans, he shall do so at no expense to the District. The Contractor shall be fully responsible for the adequacy of any traffic plan utilized, for obtaining approval from the Los Angeles County Department of Public Works for his changes, for conformance with his intended construction schedule and staging and to provide for its proper implementation.

4) The Contractor shall maintain access to all driveways for residences and businesses during the installation of the project. At the end of each working day, the Contractor shall install steel plate over all open trenches. In addition, the Contractor shall A.C. patch around the edge of each steel plate in accordance with the Los Angeles County Department of Public Works.

5) Construction or maintenance activity in the roadway or affecting the public right-of-way shall be limited to the hour between 7:00 A.M. and 3:30 P.M., Monday through Friday. No temporary traffic control devices shall be placed in the roadway until after 7:00 A.M. and shall be completely removed by 3:30 P.M at both locations.

6) All excavation areas shall be completely covered with steel plates or temporary backfilled and surfaced such that all lanes of traffic are restored and fully accessible to the public. Steel plates must be fixed in place to avoid movement. In addition to being firmly in contact with the pavement, they should be pinned, recessed into the pavement, or secured with asphalt wedges around the perimeter. Recessing involves cutting out the area where the steel plate will be placed resulting in the steel plate being flush with the pavement.

7) All existing signing shall be protected in place and free from obstructed view for traffic. In the event that an existing sign is contradictory to temporary signing for construction, the Contractor shall either completely cover the existing signing or remove the signing and supporting posts entirely and replace the complete installation, with new signing and supports, at the conclusion of construction activities.

8) The Contractor shall have all signs, delineators, barricades, etc., properly installed prior to construction

9) The Contractor shall be responsible for maintaining, at all times, all sign delineators, barricades, etc., to ensure proper flow and safety or traffic

10) Flashing yellow beacons, type "B", shall be used on all barricades that protect the work area after normal working hours as set forth herein.

11) All street access restricted by construction or maintenance activities shall be restored at the end of each working day.

12) Contractor shall replace all traffic detection devices, signing, stripping, markings, and legends damaged during construction to the satisfaction of the Los Angeles County Department of Public Works and Crescenta Valley Water District inspectors.

B. <u>Construction Project Signs:</u>

1) The Contractor shall furnish and install two (2) construction project signs notifying the public of the impending construction.

2) Contractor shall install two (2) 4' x 5' billboard signs least one (1) week prior to construction at following locations:

3) The Contractor shall also remove the signs within one week of completion of construction.

4) Each billboard shall contain the project name and description, the approximate dates when construction will be in progress, the name, and phone number of the District and its project manager and the name and phone number of the contractor. See Appendix C for sample of construction project sign.

C. No Parking Signs:

1) Los Angeles County Department of Public Works will provide one (1) temporary no parking sign and the Contractor will be required to provide additional color copies to use in the field.

2) The Contractor is required to post temporary no parking signs a minimum of 48 hours prior to construction. The Contractor shall contact the Los Angeles County Department of Public Works Sheriff's Departments and Fire Departments for verification and enforcement of temporary no parking signs a minimum of 48 hours prior to start of work.

3) The Contractor shall post the signs in accordance to Los Angeles County Department of Public Works permit requirements. The contractor shall contact all the appropriate agencies such as Police, Fire, Sheriff's Station, Parking enforcement, etc. and notify them as soon as "No Parking" Signs are posted.