

APPENDIX A
WBMWD STANDARD SPECIFICATIONS

SECTION 00700

STANDARD SPECIFICATIONS

CENTRAL BASIN MUNICIPAL WATER DISTRICT WEST BASIN MUNICIPAL WATER DISTRICT

The work to be done under this Contract requires the completion of all work in accordance with the Bidding and Contract Requirements herein, and the current edition of the following Standard Specifications, as modified herein.

The Standard Specifications for this project are defined as the Standard Specifications for Public Works Construction, latest edition (Green Book) including all supplements, as written and promulgated by the Joint Cooperative Committee of the Southern California Chapter of the Associated General Contractors of California. Copies of these Standard Specifications are available from the publisher, Building News Incorporated, 10801 National Boulevard, Suite 180, Los Angeles, California 90064, telephone (888) 264-7483.

The Standard Specifications set forth above will control the Bidding and Contract Requirements, construction materials, and construction methods for this Contract except as amended by the plans, Supplemental Standard Specifications or other contract documents. Refer to Sections 00801 and 00802 for the Supplemental Standard Specifications.

The District is not responsible for job site safety. The District will not direct, supervise or lay out the work of the contractor or any subcontractor.

The District and its representatives shall be responsible for their activity and that of its employees on the site. This shall not be construed to relieve the general contractor, or any subcontractor of their obligation to maintain a safe job site. Neither the professional activities nor the presence of the District or its employees and consultants shall be understood to control the operations of others, nor shall it be construed to be an acceptance of the responsibility for job site safety.

The contractor shall, in writing, acknowledge responsibility for the job site safety and acknowledges that the District and its representatives will not have such responsibility and that if the District and its representatives are sued by one of the contractor or subcontractor's employees, or anyone else, that the contractor will indemnify, defend, and hold the District and its representatives harmless of any and all such claims.

SECTION 00801

CONSTRUCTION MATERIALS

SECTION 200 - ROCK MATERIAL

200-2 Untreated Base Materials

200-2.1 General

Amend the first sentence of the second paragraph as follows:

When base material without further qualifications is specified, the Contractor shall supply crushed aggregate base with gradation requirements as specified by the District. The aggregate base shall have a minimum R-value of 80, a minimum sand equivalent of 50, and a minimum durability index of 40.

SECTION 201 - CONCRETE, MORTAR, AND RELATED MATERIALS

201-1 Portland Cement Concrete

201-1.1 Requirements

201-1.1.2 Concrete Specified By Class and Alternate Class

Supplement as follows:

The Contractor is to use the Concrete Class Table 201-1.1.2(A) unless specifically called out on the Plans

201-1.2 Material

201-1.2.1 Portland Cement

Amend the first sentence of the first paragraph as follows:

All cement to be used or furnished, including precast products, shall be either Type II or Type V, conforming to ASTM C150.

201-1.4 Mixing

201-1.4.4 Hand Mixing

Amend as follows:

Hand mixed concrete shall not be allowed, unless otherwise approved by the District.

201-1.6 Prepackaged Unmixed Concrete

Add as follows:

Prepackaged unmixed concrete will be allowed for main installation 12-inches and smaller provided that all requirements of Subsection 201-1 of the Standard Specifications are met.

201-2 Reinforcement for Concrete

201-2.2. Steel Reinforcement

201-2.2.1 Reinforcing Steel

Amend the first sentence as follows:

Reinforcing steel shall conform to ASTM A615, Grade 60 unless otherwise specified on Plans.

201-5 Cement Mortar

201-5.1 General

The first sentence of the fourth paragraph is amended as follows:

Cement mortar shall be used within 30 minutes after mixing with water and shall show no visible signs of setting prior to use.

SECTION 203 - BITUMINOUS MATERIALS

203-5 Emulsion--Aggregate Slurry.

203-5.2 Materials

Item 1 is amended as follows:

Emulsified asphalt shall be slow set type conforming to requirements for SS1h of Subsection 203-1.3, Test Reports and Certification and Subsection 203-3.2, Testing Requirements.

203-5.3 Composition and Grading

Supplement as follows :

The grading of the contained aggregate and the percentage of emulsified asphalt shall be Type I or II per Trench Paving Section Details on the Plans, or as required by the local jurisdictional agency.

203-6 Asphalt Concrete

203-6.1 General

Amend the second paragraph as follows:

Unless otherwise superseded by other jurisdictional agency, permit, or Special Provisions requirements, asphalt concrete shall be class and grade C1-AR-4000 for pavement base course and D1-AR-4000 for final course conforming to the requirements in this section.

SECTION 207 - PIPE

Add the following:

General. Recycled water shall be considered similar to potable water and recycled water supply pipelines and distribution systems will be designed accordingly. Submit design criteria, pipe design calculations, and plans to the District for acceptance prior to ordering pipe and appurtenances. Design calculations shall include all calculations necessary to establish pipe class or thickness and lengths of restrained joints. Plans shall, as a minimum, show pipe size, joint type, thickness or class of pipe and fittings, valve location and size, appurtenances, and lengths of restrained joints.

207-9 Iron Pipe and Fittings

207-9.1 General

Supplement as follows:

Recycled water shall be considered similar to potable water and recycled water supply pipelines and distribution systems will be designed accordingly using ductile iron pipe. Thickness design for ductile iron pipe shall be in accordance with ANSI/AWWA C150/A21.50.

207-9.2 Ductile Iron Pipe for Water and Other Liquids

207-9.2.1 General

Supplement as follows:

Unless otherwise approved by the District, the minimum pressure class for ductile iron pipe shall be Class 200 or as otherwise called out on the Plans.

All ductile iron pipe shall be designed for external loading conditions, laying conditions, and operating and surge pressures, except minimum pressure class for plain end pipe shall be 200 psi. Minimum standard thickness Class 53 shall be used for flanged or grooved end pipe. All pipes shall be designed for minimum live load of HS-20 per AASHTO standard specifications for highway bridges. A bedding angle of no more than 60 degrees shall be used for design.

207-9.2.2 Pipe Joints

Supplement as follows:

All ductile iron pipes laid underground shall have bell and spigot or mechanical joints in accordance with ANSI/AWWA C111/A21.11, unless shown otherwise. Required length of pipe with restrained joints shall be shown on the plans, or shall be determined by the Contractor and approved by the District.

Restrained joints shall be Clow Corp., Super-Lock Joints; American Cast Iron Pipe Co., Flex-Ring Joint or Lok-Ring Joint; or U.S. Pipe, TR-Flex. Megalug or Field Lok gaskets may be used on pipe greater than 12-inch in diameter with prior approval by the District. All other ductile iron pipe shall have flanged joints, unless flexible couplings or other type joints are specifically indicated on the Plans or specified.

The Contractor shall bond all ductile iron pipe joints with bond wires per District's corrosion control Standard Drawings.

207-9.2.3 Fittings

Supplement as follows:

All fittings shall be ductile iron. Fittings shall be designed for the operating and surge pressure, except that the minimum pressure rating shall be 150 psi. Compact body fittings will be permitted in accordance with ANSI/AWWA C153/A21.53 for all sizes between 6-inches and 12-inches in diameter. All fittings shall be made with "push-on" joints designed for use with the type of pipe to be joined, unless otherwise noted on the Plans.

Grooved end fittings shall be ANSI/AWWA C110/A21.10, ANSI/AWWA C606 and ANSI B16.1, radius cut grooved, rigid joint, as manufactured by Victaulic Company, or approved equal. Grooved end pipe couplings shall be malleable iron, ASTM A47, or ductile iron, ASTM A536, Victaulic Style 31, or approved equal. Gaskets for grooved end joints shall be manufacture's flush-seal type specifically designed for cast surfaces. Properties shall be as designated in ASTM D2000 for the required service. Dimensions shall conform to ANSI/AWWA C606.

Flanged fittings shall be ANSI/AWWA C110/A21.10 and ANSI B16.1, faced and drilled 125-pound ANSI standard. Flanges shall be ductile iron, ANSI/AWWA C115/A21.15, threaded, minimum 250 psi working pressure, ANSI 125-pound drilling.

Gaskets for flanged joints shall be 1/8-inch thick, cloth-inserted rubber conforming to applicable parts of ANSI B16.12 and AWWA C207, or approved equal. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in potable waterlines. Gaskets are full-face types for 125-pounds FF flange.

Mechanical joint fittings shall be ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, or may be ANSI/AWWA C153/A21.53 for pipe sizes up to 12-inches in diameter.

Push-on fittings shall be ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11, American Cast Iron Pipe Company, Fastite Joint; U.S. Pipe and Foundry, Union/Tyler Joint, or approved equal.

Proprietary restrained fittings shall be Clow Corp., Super-Lock Joint; American Cast Iron Pipe Co., Flex-Ring Joint or Lok-Ring Joint; U.S. Pipe and Foundry, TR Flex, or approved equal. Gaskets shall be rubber conforming to ANSI/AWWA C111/A21.11.

207-9.2.4 Lining and Coating

Supplement as follows:

All cement shall be type II unless otherwise specified.

207-9.2.5 Inspection and Certification

Supplement as follows:

All required test reports and certificates of compliance for pipe and fittings shall be provided to the District prior to the shipment of pipe.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection

Supplement as follows:

Unless otherwise called out on the Plans, all ductile-iron pipe, fittings, valves, and appurtenances buried underground shall be protected with two wraps of minimum 8-mil thick polyethylene encasement in accordance with the requirements of ANSI/AWWA C105/A21.5, Installation Method A, using a polyethylene tube for straight pipe and flat sheets for fittings, valves, and other appurtenances.

The polyethylene encasement shall be taped and secured with general purpose polyethylene adhesive tape 2-inches wide. The tape shall be Scotch Wrap 50, Polyken 900, Plus Flex No. 340, Protecto Wrap No. 200, or approved equal.

Add new Subsection as follows:

207-9.2.7 Recycled Water Pipeline Identification

All ductile iron recycled water pipe, fittings, valves, and appurtenances buried underground shall be identified directly on the pipe by one of the following means in accordance with the Standard Drawings:

1. Attach purple colored identification tape with the wording **⚠CAUTION: RECYCLED WATER, DO NOT DRINK⚠** directly to the top of the DI pipe and polyethylene encasement with plastic adhesive tape in accordance with Section 207-26.13.
2. As an alternative to purple identification tape, the DI pipe may be encased with purple colored polyethylene encasement stenciled with the wording **⚠CAUTION: RECYCLED WATER, DO NOT DRINK⚠** oriented on top of the pipe in accordance with Section 207-26.13. Polyethylene encasement shall have a minimum thickness of 8-mil and may be used in place of the second layer of encasement required in Section 207-9.2.6.

207-10 Steel Pipe

207-10.2 Fabricated Steel Pipe

207-10.2.1 General

Supplement as follows:

Steel pipe shall be cement mortar lined and mortar coated in accordance with the requirements of AWWA C205, or cement mortar lined and dielectric coated with mortar rock-shield, in accordance with the requirements of AWWA C214, as directed by the District. Pipe ends shall be tightly closed with a plastic wrap for protection of the cement-mortar lining during shipment. The plastic wrap shall consist of a 10-mil sheet of polyethylene plastic and shall remain on the pipe until the time of installation. Damage to the lining or coating shall be repaired, or the damaged section replaced at the expense of the Contractor.

Prior to shipping, furnish and install stulling and bracing with 90-degree spiders with a minimum of two sets of spiders per pipe length. Spiders shall fit tightly and be capable of withstanding backfill loading.

Welded steel pipe, specials, and fittings shall be handled at all times with equipment such as stout wide canvas slings and wide skids designed to prevent damage to welded steel pipe, specials, fittings, linings, and coatings. Bare cables, chains, hooks, metal bars, or narrow skids shall not be permitted to come in contact with the welded steel pipe, specials, and fittings. When shipped by truck or rail, all pipe shall be carefully loaded on cradles or saddles of suitable timbers shaped on the supporting surface and padded to fit the curvature of pipe. Pipe sections shall be separated so that they do not bear against each other, and the whole load shall be securely fastened together and to the cars or trailers to prevent movement in transit.

Patching inserts, overlays, or pounding out of dents in welded steel pipe, specials, and fittings will not be permitted. Repair of notches or laminations on section ends will not be permitted. Damaged ends shall be removed as a cylinder, and the section end properly prepared. Distorted or flattened lengths shall be rejected. A buckled section shall be replaced as a cylinder.

Physical properties and chemical composition of pipe steel shall be determined by tests on steel at the mill and certified for compliance with these specifications, and shall be reviewed by the District prior to fabrication of the pipe.

Records of the Hydrostatic Shop Test for each pipe shall be made and certified copies furnished to the District. Written notice to the District shall be given 48 hours before testing. In lieu of hydrostatic testing to straight pipe sections, radiographic testing of the full length of all butt joint welds in straight pipe sections may be done.

Records of the radiographic testing and repair shall be made and certified copies furnished to the District in lieu of the Hydrostatic Shop Test submittals.

Production welds on factory manufactured pipe shall be tested in accordance with ANSI/AWWA C200, Section 3.3 and test results delivered to the District.

Change the fifth paragraph to read as follows:

Steel plates or sheets used in the manufacture of fabricated steel pipe shall comply with the physical and chemical requirements of ASTM A570, Grades 33, 36, and 40; ASTM A36; or ASTM A572, Grade 42. Wall thickness of pipe shall be based on an allowable design stress of at least 16,500 psi.

207-10.2.2 Design Criteria

Amend the second paragraph to read as follows:

Minimum design pressure for all pipe diameters shall be 200 psi. Steel cylinders shall have a wall thickness of not less than 10 gage (0.135-inch or 3.43 mm) for all pipe diameters.

207-10.2.5 Joints

Supplement as follows:

Spigot rings for bell and spigot joints shall be Carnegie M-3516. The bell ring thickness shall be the same as the steel cylinder, but not less than 3/16-inch. Use Carnegie M-3818 when cylinder wall thickness exceeds 3/8-inch and connect to the pipe cylinder by double fillet welding of the lap joint. For Carnegie spigot and expanded bell, steel wall thickness shall not exceed 5/16-inch. Rubber gaskets shall be synthetic rubber.

Restrained joint pipe ends shall be bell-and-spigot for field lap welding. Slip joints shall be long lap joints. The bell depth specified shall be formed by mechanical expansion. Rolling of the bells is not permitted. The bells, after expansion, shall be sized to the required tolerances. The minimum inside radius on either side of the bell slope shall be 15 times the wall thickness of the steel furnished.

Thrust ties shall consist of steel tie bolts extending across the pipe joint to lugs shop welded to the pipe barrel. The joint harness shall be of adequate strength to prevent movement of the joint with 225 psi internal pressure on the pipe. The harness design shall be in conformance with AWWA M11 Steel Pipe Manual. Pipe manufacturers may submit their standard design for joint restraint to the District for review. Submit method of installation for review.

Slip joints shall be provided, as required, at a maximum spacing of 350 feet. Pipe with slip joints shall be marked specially for identification in the field. Both lap and slip joints will be field welded using a fillet weld and a seal weld where shown. The minimum bell depth and stab depth for the lap and slip joint is shown on the Standard Drawings.

The bell depth shall be measured from the outside (end) of the bell to the beginning of the radius at the back of the bell. The stab depth shall be measured from the outside (end) of the bell to the end of the straight end (spigot) when installed. In no case shall the stab depth be more than 1-1/2-inches for lap joints or 4-inches for slip joints. The minimum and maximum stab depth shall be marked on the bell and/or spigot. Deeper or longer bells, with the District's approval, may be furnished at no additional cost to the District, provided that the specified tolerances shall be maintained.

Flanges shall be ANSI/AWWA C207, Class E. Flange shall be furnished in the steel slip-on welding pattern. Flanges shall be faced smooth or may have a serrated finish of approximately 32 serrations per inch, approximately 1/64-inch deep. Serrations may be spiral or concentric. Plate or blind flanges shall have all flange faces machined flat and shall be center drilled and tapped 2-inch I.P.T. 12-inch and larger, and furnished with a standard square head pipe plug.

Final machining on the contact faces of all flanges shall be done prior to being welded to the full length of the adjacent steel plate section. Flange faces shall be checked with a straight edge and shall be perpendicular to the pipeline. All warped flanges will be returned to the pipe company for adjustment. Contractor to be responsible for all additional expenses and delays.

Gaskets for flanged joints shall be cloth-inserted sheet rubber gaskets in one piece conforming to ANSI/AWWA C207 and ANSI B16.21, 1/8-inch thick, or approved equal. The gasket shall be full-face, with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients. Segmented straight-joint or interlocking gaskets will not be accepted.

Grooved ends shall be ANSI/AWWA C606, Type B, C, or D.

Where mechanical couplings are shown, provide plain ends on pipe and/or special pieces. Plain ends shall be at least 8-inches long, shall have wall thickness not less than specified for special pieces, and shall be such that when the field joint is made, including welds, the joint shall be at least equal in strength to the adjoining pipe section. The outside diameter of the plain end section shall be such that the joint can be coupled with a mechanical coupling. Protect plain ends with at least one coat of Amercoat No. 25. Coating to have a minimum thickness of 2.5 mils.

207-10.2.8 Welding

Supplement the first paragraph as follows:

Field hand welding shall be done by certified welders in accordance with the latest edition of ANSI/AWWA C206.

Supplement the third paragraph as follows:

Production welds on factory manufactured pipe shall be tested in accordance with ANSI/AWWA C200, Section 3.3, and test results delivered to the District.

207-10.4 Protective Lining and Coating for Steel Pipe

207-10.4.1 General

Add the following paragraph:

The surface of exposed pipe shall be prepared by abrasive blast, or centrifugal wheel blast to near white, primed with one coat polyamide, anticorrosive epoxy primer, 2.5 mils minimum dry film thickness; coated with one coat polyamide high-build epoxy, 6 mils minimum dry film thickness; and two coats polyurethane enamel, 3 mils minimum dry film thickness. The surface of embedded piping shall be abrasive blasted or centrifugal wheel blasted to white metal; primed with one coat polyamide, anticorrosive, epoxy primer, 2.5 mils minimum dry film thickness; and two coats coal-tar epoxy, 16 mils minimum dry film thickness.

207-10.4.6 Preparation of Pipe Ends (Lined and Coated Pipe)

Add the following:

The linings and coatings of pipe and fittings to be field welded shall have a holdback minimum of 4-inches and a maximum of 6-inches on each side of field welds. Holdback areas for joints to be field mortared shall be blast cleaned and shop primed with the manufacturer's recommended primer.

The inside joints of pipe 24-inches and larger shall be cleaned and thoroughly wetted before being filled with stiff cement mortar and finished off smooth by troweling, or other equivalent method as approved by the District.

The outside joints of cement-mortar-coated pipe shall be coated with cement-mortar retained by diapers so as to bridge the joint and maintain the specified minimum coating thickness over the joint. The mortar shall be compacted within the diaper to produce a dense coating without voids. The materials and application procedures shall be in accordance with ANSI/AWWA C205. Diapers shall be as manufactured by Mar-Mac Company or equal, Diaper material shall be at least 12-ounce duck.

Outside joints of dielectric coated pipe shall be coated pipe, manufacturer's requirements in accordance with AWWA C214.

Add new Subsection as follows:

207-10.4.7 Fabrication Identification Marking

Each fabricated pipe section or special shall be marked with nontoxic paint on each end both inside and outside the pipe. The minimum size of the lettering shall be 4-inches. The number marking on each spool shall correspond to the Shop Drawings.

Add new Subsection as follows:

207-10.4.8 Recycled Water Pipeline Identification

All steel recycled water pipe, fittings, valves, and appurtenances buried underground shall be identified directly on the pipe by attachment of purple colored identification tape with the wording **CAUTION: RECYCLED WATER, DO NOT DRINK** directly to the top of the steel pipe with plastic adhesive tape in accordance with Section 207-26.13 and the Standard Drawings.

Add new Subsection 207-25 as follows:

207-25 Polyvinyl Chloride Pressure Pipe (PVC) 4-Inch through 18-Inch

207-25.1 General

These specifications apply to polyvinyl chloride pressure pipe (PVC) for the transmission and distribution of recycled water under pressure. PVC pipe shall be of the size, type, pressure or class shown on the plans or in the specifications. PVC pipe 4-inches and 12-inches in diameter shall comply with ANSI/AWWA C900, Class 200 minimum. PVC pipe greater than 12-inches but less than or equal to 18-inches in diameter shall comply with ANSI/AWWA C905.

207-25.2 Material Requirements

Material used to produce the pipe shall be made from Class 12454-B, rigid polyvinyl chloride compounds, or better, as outlined in ASTM D1784, with an established hydrostatic design basis (HDB) equal to or greater than 4000 psi for water at 73.4 degrees F (23 degrees C), and a wall thickness to a dimension-ratio (DR) series 14.

207-25.3 Joints

Joints for PVC pressure pipe shall be pipe integral bell and spigot joints with elastomeric gaskets, unless noted otherwise. Elastomeric gaskets shall comply with the requirements

specified in ASTM F477. All pipes shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

207-25.4 Inspections and Certifications

All PVC pressure pipe shall be manufactured in strict accordance with the latest revisions of ANSI/AWWA C900 or C905 and the applicable ASTM standards listed therein. The manufacturer shall furnish an affidavit that all delivered materials comply with the requirements of ANSI/AWWA C900 or C905 and these specifications.

207-25.5 Fittings

All fittings for PVC pressure pipe shall be ductile-iron and shall be in accordance with the latest revisions of ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53, and in accordance with Subsection 207-9. Fittings shall be lined and coated as specified in Subsection 207-9.2.4 and encased with polyethylene in accordance with subsection 207-9.2.6. All fittings shall be restrained joint type or shall be thrust-blocked and anchored in accordance with the Standard Drawings. Bell size shall be for Class 200 cast-iron equivalent PVC pressure pipe, including the rubber-ring retaining groove.

207-25.6 Installation

PVC pressure pipe shall be installed in accordance with AWWA Manual No. M23, "PVC Pipe - Design and Installation" and the manufacturer's installation guide. Pipe shall be bedded in accordance with Subsection 306-1.2.13. Pipe bedding shall provide uniform longitudinal support under the pipe. Pipe bedding material shall be worked under the sides of the pipe to provide satisfactory haunching and be hand tamped to a ninety percent (90%) minimum relative compaction.

207-25.7 Polyvinyl Chloride (PVC) Pipe -1-Inch Through 3-Inch

PVC pipe shall be made from all new rigid unplasticized polyvinyl chloride and shall be Normal Impact (Type I) Schedule 40, unless otherwise shown. Elbows and tees shall be of the same material as the pipe. Unless otherwise shown, joints shall be solvent-welded in accordance with the manufacturer's instructions. Expansion joints or pipe bends shall be provided to absorb pipe expansion over a temperature range of 100 degrees F. PVC pipe shall be approved for recycled water use.

207-25.8 Service Saddles

All service connections to PVC pressure pipe water main shall be constructed with bronze service saddles, double-strap type, with CC threads for receiving a bronze corporation stop in accordance with the Standard Drawings. Service saddles for PVC pressure pipe shall be manufactured to provide full support around the circumference of the pipe and have a minimum width of 2-inches along the axis of the pipe in order to provide full bearing and prevent distortion of the pipe when the saddle is made tight.

Service saddles shall be double strap type as manufactured by the following:

- 1) Mueller H-13400
- 2) James Jones J-996

207-25.9 Recycled Water Pipeline Identification

PVC recycled water pipe shall meet the above specifications and shall be colored purple. All such pipe shall be embossed or integrally stamped/marked with black stenciling on opposite sides of the pipe with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK". Lettering shall be a minimum of 5/8-inches in height and repeated every 12-inches. The purple pipe color shall be achieved by adding pigment to the PVC material as the pipe is being manufactured.

As an alternative to purple colored pipe, PVC recycled water pipe may be installed with purple colored tape attached directly to the top of the pipe or wrapped in polyethylene encasement in accordance with Section 207-26.13 and the Standard Drawings.

207-25.10 Tracer Wire For PVC Pipelines

Copper tracer wire shall be installed with all PVC pipelines, centered and just above the top or crown of the pipe for the purpose of providing a continuous signal path for electronic pipe locators used to determine pipe alignment after installation. The copper wire shall be No. 12 cu. with HMWPE insulation. The wire shall be electrically continuous throughout the entire pipe system including adjacent service line assemblies. At service lines, the wire shall be extended up the pipe and secured by a cable lug under the top nut of one set of bolts. At cul-de-sacs, the wire shall be placed in the same trench with the last lone side service lateral and extended into the meter box. All splices shall be wrapped with PVC tape and the wire shall be tied to the pipe at 10-foot intervals with plastic adhesive tape. Tracer wire shall be extended to surfaces as shown on the Standard Drawings. The Contractor shall provide the District with results of electrical continuity test.

Add new Subsection 207-26 as follows:

207-26 Pipe Appurtenances

207-26.1 General

Unless specified, all appurtenances shall comply with the specifications herein and the appropriate Standard Drawings.

207-26.2 Main Line Valves

207-26.2.1 General

Location, station, size, type of valve, and end connection shall be shown on the Plans.

Valves shall be iron body, non-rising stem, butterfly or resilient wedge disc gate type. All valves shall open by turning the wrench nut counter clock-wise. All valves shall be equipped with O-ring stem seals and shall have mechanical joints or flanged ends or a combination of both.

All valves installed at fittings shall be flanged by mechanical ends with the flange abutting the fitting. All valves shall be provided with a stem extension if depth of valve nut exceeds four feet. All valve extensions shall be centered in the valve well by use of a guide and shall operate freely without binding after installation.

207-26.2.2 Gate Valves-3-Inches and Smaller

Gate valves 3-inches and smaller shall be all-bronze, screwed bonnet and ends, single solid wedge gate, non-rising stem, rated 150-pound SWP, 300-pound WOG and shall be manufactured by one of the following or an approved equal:

- 1) Stockham: B128
- 2) Crane Co.; Cat. No. 437

207-26.2.3 Resilient-Wedge Gate Valves

Resilient-wedge gate valves shall conform to the latest revision of ANSI/AWWA C509 and the following:

- 1) Resilient-wedge gate valves shall be iron bodied with all bronze internal mountings and working parts. Valve stems shall contain no more than five-percent zinc and two percent aluminum.
- 2) Resilient-wedge gate valves shall have non-rising stems; two O-rings sealed above the thrust collar, with a two-inch square operating nut, opening counterclockwise, and shall be designed for 200 psi working water pressure.
- 3) Resilient-wedge gate valves shall have sizes and type of ends as shown on the Plans or Specifications.
- 4) Resilient-wedge gate valve suppliers shall furnish the District with an affidavit of compliance to ANSI/AWWA C509.

- 5) Resilient-wedge gate valves shall have their internal surface fusion epoxy coated, except stainless steel and rubber surface, as specified in Section 207-26.2.7.
- 6) Resilient-wedge gate valves shall have the disc 100% encapsulated and completely open at bottom of wedge for drainage.

Resilient wedge gate valves shall be manufactured by one of the following or an approved equal and shall meet all of the above requirements:

- 1) Mueller Company
- 2) Clow Corporation
- 3) M & H Kennedy

207-26.2.4 Butterfly Valves

Butterfly valves shall conform to the latest revision of ANSI/AWWA C504 and the following:

- 1) Butterfly valves and operators shall be Class 150B constructed for direct burial and have flanged ends unless otherwise specified.
- 2) Butterfly valves shall be furnished with operators of the traveling nut or worm gear type, self-locking in any position, and sealed, gasketed, and lubricated to withstand a submersion in water to 10 psi. The valve shall be open by counterclockwise rotation of a two-inch square AWWA operating nut. Minimum turns to open 15- to 24-inch valves shall be 35 and minimum turns to open 30- to 42-inch valves shall be 150. Enclose moving parts of valve and operator in housing to prevent contact with the soil. Buried valves shall have extension stems, bonnets, and valve box nuts.
- 3) The operator shall be capable of meeting the torque requirements for opening and closing the valve against:
 - (a) 150 psi upstream and 0 psi downstream; and
 - (b) Maximum flow rate of 12 FPS, normal flow rate of 6 FPS, and shall be provided with AWWA stops capable of absorbing up to 250 foot/pounds of input torque at the fully open or fully closed positions without damage to the valve or operator.
- 4) Butterfly valves shall have seats applied to the body and have a seat surface of stainless steel type 316, monel, Ni-chrome or bronze. All internal mountings or working parts shall be stainless steel. Butterfly valves shall have the shaft's O-ring sealed or Chevron packing. The shaft shall not be exposed between the valve body and the operator.

- 5) Butterfly valves shall be furnished with records of tests specified in ANSI/AWWA C504, Subsection 2.3 and Section 5. All valves shall be furnished with certified drawings and parts lists of the valve and operator. An affidavit of compliance to ANSI/AWWA C504 shall be furnished for all valves. Five (5) sets of the above information shall be furnished to the District as part of the submittals.
- 6) Butterfly valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.
- 7) The minimum interior port diameter of the valve shall be one-inch smaller than the nominal diameter of the equivalent pipe. Butterfly valves shall be manufactured by one of the following or an approved equal and shall meet the above requirements:
 - (a) Kennedy
 - (b) Clow Corporation
 - (c) Dezurik
 - (d) Pratt
 - (e) Mueller

207-26.2.5 Check Valves

Unless otherwise specified, check valves 2-1/2-inches and larger shall conform to the following:

- 1) Check valves shall be swing type, iron bodied with flanged ends fitted with outside spring and lever.
- 2) Check valves shall be designed for 150 psi working pressure and a 300 psi test pressure, unless otherwise specified.
- 3) Check valves shall be functional in both vertical and horizontal position.
- 4) Check valves shall be fully bronzed mounted and have a stainless steel hinge pin. The disc shall be rubber faced with a bronze seat ring.
- 5) Check valves 2 1/2-inches through 12-inches shall be furnished with conventional packing.
- 6) Check valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.

Check valves shall be manufactured by one of the following or an approved equal:

- 1) Mueller A-2602-6-02
- 2) Clow F-5340

207-26.2.6 Air-Release and Vacuum-Relief Valves

207-26.2.6.1 General

This section includes materials of air and vacuum valves and air-release valves for water service. All valves shall be combination air release and vacuum valves.

207-26.2.6.2 Materials

Valves are identified on the Plans by size and type. Materials of construction for air-release valves for water service shall be as follows:

<u>Item</u>	<u>Material</u>	<u>Specification</u>
Body and Cover	Cast iron	ASTM A 126, Grade B
Float	Stainless Steel	ISI Type 316, ASTM A 240 or A 276
Linkage, orifice air-release mechanism	Stainless Steel	AISI Type 316, ASTM A 240 or A 276
Needle	Buna-N	

207-26.2.6.3 Valve Design and Operation

Air release and vacuum valves for water service shall have float assembly and large venting orifice to exhaust large quantities of air from pipelines when being filled and to admit large quantities of air when pipelines are being drained. Valve shall have a body with flanged top containing the air-release orifice. The float shall rise with the water level in the valve body to close the orifice by sealing against a synthetic rubber seat. Float shall be protected by a baffle to prevent premature closing and shall withstand an external pressure of 1,000 psig without collapsing. Do not use designs having levers and weights attached to the floats. Float shall have a one-piece guide rod extending out the bottom end to engage the guide bushings in the valve body at all times.

Air release and vacuum valves larger than 4-inches shall have a 1-inch threaded drain outlet with bronze plug near the bottom of the valve body and a 2-inch threaded outlet with bronze plug on the side of the valve body above the minimum water level in the valve which forces the float against the valve seat. The valve outlet shall have a protective steel hood to prevent entry of foreign material.

207-26.2.6.4 Valves

1) Air Release and Vacuum Valves, 1-inch:

Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 143C, Crispin UL 10, Val-Matic Model 201C or approved equal.

2) Air Release and Vacuum Valves, 2-inches:

Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 145C, Crispin UL 20, Val-Matic Model 202C or approved equal.

3) Air Release and Vacuum Valves, 3-inches:

Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 147C, Crispin UL30, Val-Matic 203C or approved equal.

4) Air Release and Vacuum Valves, 4-inches:

Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 149C, Crispin UL40, Val-Matic 204C or approved equal.

5) Air Release and vacuum valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.

207-26.2.7 Valve Painting and Coating

Metal valves (except bronze and stainless steel valves) located in vaults and structures shall have a zinc prime coat, fusion epoxy (interior of valves only) intermediate and finish coat.

207-26.2.7.1 Surface Preparation

Prime Coat: Self-curing, two-component inorganic zinc rich coating recommended by the manufacturer for overcoating with a epoxy finish coat. Minimum zinc content shall be 14 pounds per gallon. Apply to a thickness of 3 mils. Products: Tnemec N90E92, Porter 311 Zinc-Lock, Ameron Dimetcote 9, or approved equal.

Intermediate and Finish Coat: 100 percent solids, thermosetting or catalytic, fusion bonded, dry powder epoxy, suitable for the intended service as recommended by the manufacturer, Scotchkote 134 or approved equal.

Valves shall be coated on their interior metal surfaces excluding seating areas and bronze and stainless steel pieces. Sandblast surfaces in accordance with SSPC SP-5. Remove all protuberances, which may produce pinholes in the lining. Round all sharp edges to be coated. Remove any contaminants, which may prevent ponding of the lining, Coat the interior ferrous surfaces using one of the following methods:

- 1) Apply powdered thermosetting epoxy per the manufacturer's application recommendations to a thickness of 10 to 12 mils.
- 2) Apply two coats of catalytically setting epoxy (Keysite 740, Gilpon, or equal) to a dry film thickness of 10 to 12 mils total. Follow the paint manufacturer's application recommendations including minimum and maximum drying time between required coats.

All epoxy lining shall be fusion epoxy applied by the manufacturer. Coat interior surfaces of cast iron valves at the place of manufacturer. Do not coat seating areas and plastic, bronze, stainless steel, or other high alloy parts.

207-26.3 Main Line Pipe Fittings

207-26.3.1 Flexible Couplings

Unless otherwise specified, flexible couplings shall conform to the following:

- 1) Each coupling shall consist of one steel middle ring, two steel followers, gaskets, and sufficient numbers of Type 316 stainless steel bolts to compress the gasket without distorting the followers.
- 2) The thickness of the middle ring shall be such that the stress in the steel shall not exceed 50 percent of the yield point when subjected to the hydrostatic test pressure of the pipeline. The pressure rating shall be no less than the indicated design pressure. The middle ring thickness shall not be less than the thickness of the pipe jointed.
- 3) Middle rings shall be cold expanded a minimum of one-percent increase in diameter to test the weld and the size of the proper dimension.
- 4) The middle rings shall be coated with Keysite 740 or District-approved coating to a minimum dry film thickness of 10 mils. Follower rings shall be coated with a compatible shop coat for field coating.

- 5) Bolts shall be 5/8-inch diameter carriage bolts with hexagon nuts. The steel shall have minimum yield strength of 40,000 psi.
- 6) Buried coupling shall be coated with fusion bonded epoxy and provided with Type 316 stainless steel bolts and nuts.
- 7) Provide thrust ties where shown and where required to restrain the force developed by 1-1/2 times the operating pressures specified. Attach thrust ties to steel pipe with fabricated lugs and to ductile iron pipe with socket clamps against a grooved joint coupling or flange.
- 8) Flexible couplings shall be:
 - (a) Baker
 - (b) Dresser
 - (c) Rockwell
 - (d) Ford
 - (e) Approved Equal

207-26.3.2 Flanges

Unless otherwise specified, flanges shall conform to the following:

- 1) Flange size 4-inches through 24-inches shall comply with ANSI/AWWA C207, 150 psi primary service rating.
- 2) Flange sizes 30-inches through 96-inches shall comply with ANSI/AWWA C207, Class D, 150 psi.
- 3) Flange sizes 4-inches through 96-inches shall be furnished in the steel slip-on welding pattern.
- 4) Flanges shall be faced smooth or may have serrated finish of approximately 32 serrations per inch, approximately 1/64-inch deep. Serrations may be spiral or concentric.
- 5) Plate or blind flanges shall have all flange faces machined flat and shall be center drilled and tapped 1-inch I.P.T., 4-inch through 10-inch; 2-inch I.P.T. 12-inch and larger; and furnished with a standard square head pipe plug.
- 6) Final machining on the contact faces of all flanges shall be done prior to being welded to the full-length adjacent steel plate section. Flange faces shall be checked with a straight edge and shall be perpendicular to the pipeline. All warped flanges will be returned to the pipe company for adjustment. Contractor shall be responsible for all additional expenses and delays.

- 7) Where gaskets are to be furnished, they shall be 1/16-inch minimum thickness, cloth inserted rubber, and full-face gaskets meeting Federal Specification HH-P-151, or approved equal.
- 8) Nuts and bolts for all underground installations shall be type 316 stainless steel and coated with two coats of 10 Mils each of Carbolite Bitumastic No. 50, or approved equal.

207-26.3.3 Insulation Kit/Gaskets

Unless otherwise specified, insulation kit/gaskets shall conform to the following:

- 1) The insulation gasket shall fit between Class D flanges, 150 psi pressure class.
- 2) Insulation gaskets shall be full pattern, fabric-reinforced phenolic, neoprene face, 1/8-inch thick.
- 3) The gasket shall have the following minimum physical characteristics:
 - (a) Compression strength - 24,000 psi
 - (b) Dielectric strength - 500 V/Mil
 - (c) Operating temperature up to 175 degrees F
 - (d) Water absorption - 1.6 percent
- 4) A mylar sleeve and double phenolic washers shall be used for each bolt or cap screw, EN-DW kit or approved equal. The one-piece sleeve and washer shall have the following physical characteristics:
 - (a) Sleeve thickness - 1/32-inch
 - (b) Washer thickness - 5/32-inch
 - (c) Dielectric strength - 1200 V/Mil
 - (d) Operating temperature up to 175 degrees F
 - (e) Water absorption maximum - 0.22%
- 5) Flange insulation kits shall be:
 - (a) PSI Products, Inc., Burbank, California
 - (b) Central Plastics Company, Shawnee, Oklahoma
 - (c) CALPICO, Inc., San Francisco, California
 - (d) Approved Equal

207-26.4 Copper Pipe and Fittings

When copper pipe is to be furnished, the pipe shall conform to ASTM B88 for Type K hard drawn or soft annealed as shown on the Standard Drawings. When wrought

copper solder-type fittings are shown on the Standard Drawings, the joints shall be soldered with 95/5 non-leaded solder.

When brass or bronze fittings with threaded, copper flare or sweat weld (solder) ends are shown on the Plans or Standard Drawings, the fittings shall conform to ANSI/AWWA C800. Fittings shall be furnished by Mueller, Jones, Ford, or District-approved equal.

207-26.5 Brass Pipe, Nipples, and Fittings

Short threaded nipples, brass pipe, and fittings shall conform to ASTM B43, regular wall thickness. Threads shall conform to ANSI B2.1.

207-26.6 Bronze Appurtenances

All items specified herein shall be manufactured of bronze conforming to ASTM B62.

All services saddle bodies shall be manufactured of bronze and shall be tapped for a C.C. thread. The seal with the pipe shall be effected with either a rubber gasket or an O-ring. All service saddles shall be a double-strap type. The straps (or bails) shall be flat and shall be manufactured of Everdur or Silnic bronze. For PVC pipe use 2-inch wide SS bands instead of bronze bails.

Corporation stops shall be manufactured of bronze. The inlet fitting shall be a male C.C. thread and the outlet connection shall be a flared copper connection. Angle meter stops shall be manufactured of bronze. The inlet connection shall be a flared copper connection and the outlet fittings shall be a meter flange, or meter coupling. The inlet and outlet shall form an angle of 90 degrees on a vertical plane through the centerline of the meter stop. A rectangular lug and lock wing shall be provided on the top of the fitting to operate the shutoff mechanism. Ball (meter) valves shall be manufactured of bronze. It shall have a lever-type turn handle with the inlet being a meter flange or a meter coupling and the outlet female iron pipe.

207-26.6.1 Bronze Flanges

Bronze flanges shall conform to ANSI B16.24, Class 125 or Class 150, to match the connecting flange. Use solder end companion flanges. When both above ground adjoining flanges are bronze, use bronze bolts and nuts. Bolts shall conform to ASTM F468, Grade C65100 or C63000. Nuts shall conform to ASTM F467, Grade C65100 or C63000. When only one of the above ground adjoining flanges is bronze, use Type 316 stainless steel bolts and nuts. Connect to buried ferrous flanges with flange insulation kits. Bolts used in flange insulation kits shall conform to ASTM B193, Grade B7. Nuts shall comply with ASTM A194, Grade 24. If the adjoining buried flange is bronze, use bronze bolts and nuts without a flange insulation kit.

207-26.7 Insulating Bushings and Unions

Pipe or fittings made of non-ferrous metals shall be isolated from ferrous metals by nylon insulating pipe brushings, unions, or couplings as manufactured by Pipeline Coating and Engineering Company, Smith Blair, Pipe Seal and Insulator Company, or approved equal.

207-26.8 Small Steel Pipe

Unless otherwise shown, galvanized steel pipe and black steel pipe in sizes 6-inches in diameter and smaller shall conform to the requirements of the "Specifications for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses" (ASTM A 120), and shall be standard weight unless otherwise shown. Galvanized steel pipe shall be wrapped with PVC tape, one half lap. PVC tape shall be 10 mil thickness. Fittings and unions shall be of threaded 150-pound galvanized malleable iron conforming to ASTM A197 with dimensions conforming to ANSI 16.3, unless otherwise shown.

207-26.9 Steel Pipe Casing

Steel casing pipe shall be new and shall be butt-welded steel sheets conforming to ASTM A-570 Grade 30 or of steel plate conforming to ASTM A-233, Grade C. Minimum diameter and thickness shall be as shown on the Standard Drawings. The Contractor may select a greater diameter or wall thickness as convenient for the method of work and loadings involved or as required by the agency having jurisdiction over the road or railroad crossing. Casing selections shall be joined by full circumferential butt welding in the field. Prepare ends of casings for welding by providing 1/2-inch by 45-degree chamfer on outside edges. The annular space between the casing and carrier pipe shall be filled with air blown sand. All carrier pipes passing under railroads or freeways shall be restrained. DIP carrier pipe shall have restrained joints while PVC carrier pipe shall be restrained with EBAA Iron Series 1500 retainers or approved equal.

207-26.10 Precast Concrete Vaults

Precast concrete vaults shall comply with ASTM C858, except as modified herein. Design loads shall consist of dead load, live load, impact, and in addition, loads due to water table and any other loads that may be imposed upon the structure. Minimum design live loads shall be for HS20 per AASHTO standard specifications for highway bridges. Minimum design wheel load shall be 16 kips. All vaults located within roadways or driveways shall have traffic covers. Vaults in all other locations shall have parkway covers.

Vault frames and covers shall be fabricated steel and shall be fabricated with supports to resist deflection. Frames and covers shall be galvanized. All covers shall be hinged and have spring or torsion bar assists. All covers shall be equipped with a hold-open mechanism and with bolt down or locking devices. Contractor shall be responsible to

place covers so that the cover is flush with surrounding surface, unless otherwise specified and shall make all necessary adjustments so that the cover meets these requirements. All mortar joints in precast concrete vault section shall be made watertight. The joint sealing compound shall be permanently adhesive flexible plastic material complying in every detail to Federal Specification SS-S-00210.

All voids or openings in the vault walls around pipes shall be filled with 3,000 psi concrete or mortar, using an approved epoxy for bonding concrete surfaces.

207-26.11 Precast Concrete Manholes

Precast concrete manholes shall comply with ASTM C478, except that the wall thickness shall be a minimum of 6-inches with a minimum 4-foot diameter. The minimum allowable steel shall be hoops of No. 4 wire cast into each unit. Street-type manhole frames and covers shall be made of cast iron conforming to ASTM A48, Class 30. Castings shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Frames and covers shall be heavy duty, traffic type, 36-inches clear opening. For 2-inch blowoff specifications are identical but clear opening should be 24". The cover shall seat firmly into the frame without rocking. Grind or otherwise finish each cover so that it will fit in each frame without rocking. Match marked sets of frames and covers prior to shipping. Covers for manholes shall have the word "WBMWD RECYCLED WATER or CBMWD RECYCLED WATER, as applicable, cast thereon in 3-inch high letters, 1/4-thickness and 1/4-inch deep. Do not apply any other lettering. Before leaving the foundry, clean castings and subject them to a hammer inspection. Then dip casting twice in a preparation of asphalt or coal tar and oil applied at a temperature or not less than 290 degrees F, nor more than 310 degrees F. Concrete used in manholes and pouring the manhole base shall be Class 560-C-325 or 565-C-3250P per Section 201.

207-26.12 Thrust Blocks and Anchor Blocks

Restrained joints shall generally be used for thrust protection for pipelines over 12-inches in diameter and for thrust protection in street intersections and at locations of utility congestion.

Where used, show location, station, and dimensions of thrust blocks on the Plans.

Concrete thrust and anchor blocks shall be installed at the location and in accordance with the positions and dimensions as shown on the Standard Drawings. The District may direct any change in direction, location or dimension for field conditions or soil conditions that may arise.

207-26.13 Recycled Water Pipeline Identification Tape and Encasement

Recycled water pipeline identification tape shall be a minimum 4 mil thickness, virgin low-density polyethylene, specifically formulated for extended use underground. The tape tensile strength shall be in accordance with ASTM D882 and be not less than 4100

MD and 3650 TD. Elongation properties shall be in accordance with ASTM D882 and be greater than 600% at break point. Tape width shall be 6-inches for 6-inch diameter and smaller pipe and shall be 12-inches for 8-inch diameter and larger pipe. Identification tape shall be colored purple (Pantone 512) with black lettering a minimum of 2-inches in height repeating every 36-inches.

For pipeline identification tape attached to the top of the pipeline, the printed warning message shall read: A CAUTION: RECYCLED WATER, DO NOT DRINK. Identification tape shall be installed continuously for the entire length of the pipe and shall be properly fastened to each pipe length by plastic adhesive tape banded around the pipe and identification tape at no more than 5-foot intervals. Tape attached to the sections of pipe before laying in the trench shall have 5-foot minimum overlap for continuous coverage.

Purple colored polyethylene encasement may be substituted for identification tape and shall consist of minimum 8 mil thickness low density polyethylene. The printed message shall read: A CAUTION: RECYCLED WATER, DO NOT DRINK with minimum 1-inch black letters repeating every 18-inches to 24-inches along the length of the encasement. The printing shall be approximately every 11-inches around the circumference of the encasement for 21-inch and larger encasement. The printing shall be once around the barrel for 16-inch and smaller encasements.

For pipeline warning tape buried 12-inches above the pipe, the printed warning message shall read: A CAUTION: RECYCLED WATER LINE BELOW.

Identification tape, warning tape and polyethylene encasement shall be as manufactured by T. Christy Enterprises, Griffolyn Co. or approved equal.

207-26.14 Recycled Water Warning Tags

The District requires recycled water warning tags to be installed on all appurtenances in vaults or aboveground, such as, but not limited to, air release valves, blowoff valves, valve boxes, and meters. Recycled water warning tags shall be weatherproof plastic, 3-inch by 4-inch, with purple background and black or white lettering stating "CAUTION: RECYCLED WATER - DO NOT DRINK" on one side and "AVISO: AGUA IMPURA-NO TOMAR" on the other side. Tags shall be attached to each device with a nylon tie wrap. Recycled water warning tags shall be as manufactured by T. Christy Enterprises, Inc., or approved equal.

All recycled water valve boxes for recycled water facilities shall have the inscription "RW - CBMWD OR WBMWD" on the valve box cover.

SECTION 210 - PAINT AND PROTECTIVE COATINGS

210-1 Paint

210-1.5 Paint Systems

Supplement as follows:

For metal surfaces, primer for galvanized surfaces shall be two coats each of Sherwin-Williams "Galvanized Iron Primer", or approved equal. Primer for ungalvanized surfaces shall be two coats each of Sherwin-Williams "Kromik Metal Primer", or approved equal. If no finish paint is to be applied (only where specified), apply two additional coats of the above primers to give a finished dry film thickness of 10.0 mils minimum. Finish paint shall be Sherwin-Williams "Metalastic II", or approved equal. Finished coating thickness shall be 6.0 mils minimum, dry film thickness. Color shall be Pantone 512. Color chips of all finish paints to be used must be submitted to District prior to commencing work.

Piping and fittings in vaults or exposed to the atmosphere shall be field epoxy coated with a minimum total dry film thickness of 13 mils in accordance with ANSI/AWWA C210, except as modified herein. Surface shall be prepared in accordance with SSPC SP-10. The prime coat shall consist of a self-curing, two-component, inorganic zinc-rich coating recommended by the manufacturer for over coating with a high-built epoxy finish coat. Minimum zinc content shall be 14 pounds per gallon. Apply to a minimum thickness of 3 mils. Prime coat shall be Tnemec N90E92, Porter 311 Zinc-Lock, Ameron Dimemote 9, or approved equal. The intermediate and finish coat shall be a high-built epoxy having minimum volume solids of 60 percent. The intermediate and finish coat shall have a minimum thickness of 5 mils each coat. The intermediate and finish coat shall be Tnemec Series 20, Porter 7510, Koppers Hi-Guard, Ameron 385 or approved equal.

Add new Subsection as follows:

210-1.8 Concrete Vaults and Manholes

The interior and exterior of concrete vaults and manholes shall be coated with crystalline waterproofing. Crystalline waterproofing shall be cementitious coating containing components that will diffuse into the concrete by water, react with lime, and create an impervious, waterproof, calcified barrier in the substrate. Technical requirements are as follows:

- 1) Permeability at 2.6×10^{-8} cm/sec (2 coats) minimum per Army COE CRD-C 48-55 or CRD-6 48-73.
- 2) Compatibility; shall produce no degradation of substrate.

Add new subsection as follows:

210-1.9 Recycled Water Color Coding

It is required that above-ground or exposed facilities be color coded to differentiate recycled water facilities from potable water or wastewater facilities as follows:

Valve Box Covers	Two Coats Purple (Pantone 512)
Air Valves and Piping	Two Coats Purple (Pantone 512)
Blowoffs/Covers	Two Coats Purple (Pantone 512)

In certain instances, the color may be tan; final color shall be verified with the District prior to construction.

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

SECTION 00802

CONSTRUCTION METHODS

SECTION 300 - EARTHWORK

300-1 Clearing and Grubbing

300-1.1 General

Amend as follows:

The Plans shall show the limits of clearing and grubbing, and designate trees and shrubs to be removed. All other trees and shrubs shall be protected in place, or replaced in kind at Contractor's expense.

300-1.3 Removal and Disposal of Materials

300-1.3.1 General

Add paragraph as follows:

Cleared material shall be disposed of in such a manner as to meet all requirements of state, county, and local regulations regarding health, safety, and public welfare

300-1.3.2 Requirements

Amend paragraph (a) Bituminous Pavement as follows:

Bituminous pavement shall be removed to clean, straight lines. Prior to removal of existing surfacing, pavement cuts shall be made in accordance with the Standard Drawings as specified herein, or as required by local jurisdictional agency. All pavement cuts shall be neat and straight along both sides of the trench or excavation and parallel to its alignment. Where large irregular surfaces are removed, such trimming or cutting shall be parallel to the roadway centerline or right angles to the same.

After backfilling and compaction, final pavement cuts shall be made by sawcutting (unless permit requirements supersede), to a minimum depth of two (2) inches at the location shown in the appropriate trench pavement sections.

300-2 Unclassified Excavation

300-2.2 Unsuitable Material

300-2.2.1 General

Add the following:

Handling of Contaminated Soil. The Contractor shall adhere to the requirements of all federal, state, and local governing agencies, including, but not limited to, OSHA Title 29, Part 1910.120 and Title 8 CCR 5192 (OSHA 40 Hour Hazardous Materials Training) for the handling of contaminated soil. The Contractor shall adhere to the health and safety plan provided by the District's designated hazardous waste representative and employee-training programs shall be submitted to the District prior to commencement of work by the Contractor.

All trenching and excavation operations in the vicinity of known or suspected contaminated soils shall be monitored with a photo ionization detector (PID) or equivalent instrument.

Contractor shall immediately notify the District when suspected or known contamination is about to be encountered or when unknown contamination is encountered.

Suspected or known contaminated soils shall be segregated and stockpiled on site in an area designated by the District and accessible to the District's designated representative for testing, loading, and off-hauling. The Contractor shall supply and install an adequate amount of 6-mil or thicker plastic film under and over all excavated contaminated stockpiles.

The District's designated representative shall perform all testing to determine soils that are contaminated and shall be disposed by the District's designated representative at an approved disposal facility appropriate to the type of contaminants identified.

The Contractor shall be responsible for all employee personal protective equipment as required by all applicable federal, state, and local regulations.

The Contractor shall coordinate with the District's designated representative in areas of suspected or known contaminated soil.

300-4 Unclassified Fill

300-4.7 Compaction

Amend the second paragraph to read as follows:

Each layer of earth fill shall be placed in 8-inch maximum lifts and compacted to obtain a relative compaction of not less than 90 percent as determined by ASTM D-1557, latest revision, or as specified by the Soils Engineer.

SECTION 301 - TREATED SOILS, SUBGRADE PREPARATION, AND PLACEMENT OF BASE MATERIALS

301-1 Subgrade Preparation

301-1.2 Preparation of Subgrade

Supplement as follows:

After the subbase has been prepared, a weed killer shall be applied to the entire subbase surface. Weed killer shall be Poly-Bor-Chlorate as manufactured by Coast Borax Company, Borascu concentrated type as manufactured by Pacific Coast Borax Company, or equal. The weed killer shall be applied according to the manufacturer's published instructions.

301-1.3 Relative Compaction

Amend as follows:

Unless otherwise superseded by other jurisdictional agency, permit requirements, or Special Provisions requirements, subbase shall be compacted to not less than the minimum relative density shown on the applicable trench pavement sections on the Plans or the Standard Drawings, or per the local jurisdictional agency requirements.

SECTION 302 - ROADWAY SURFACING

302-4 Emulsion Aggregate Slurry

Add new subsection as follows:

302-4.7 Final Course

The final course of asphalt concrete pavement shall be slurry sealed with an asphalt emulsion after compaction. The asphalt emulsion shall be Type SS-1h applied at a rate of 0.25 gallons per square yard, in accordance with Subsection 203-3.

302-5 Asphalt Concrete Pavement

302-5.1 General

Supplement as follows:

Unless otherwise superseded by other jurisdictional agency permit requirements or Special Provisions requirements, the minimum asphalt concrete pavement thickness shall be 3-inches placed upon a 6-inch aggregate base. The asphalt concrete shall be placed in two courses: a base course and a final course. The base course shall be constructed 2-inches in thickness to within 1-inch of the existing surface. The final course shall be a minimum 1-inch in thickness over the trench or as directed by the District.

The final course of the asphalt concrete pavement shall be fog sealed with an asphalt emulsion after compaction. The asphalt emulsion shall be Type SS-1h applied at a rate of 0.25 gallons per square yard, in accordance with Subsection 203-3.

302-5.3 Prime Coat

Amend as follows:

A prime coat consisting of SC-250 liquid asphalt shall be applied at a rate of 0.25 gallons per square yard. Grade SC-70 liquid asphalt may be used when approved by the District.

SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

306-1 Open Trench Operations

306-1.1 Trench Excavation

306-1.1.1 General

Amend the third paragraph as follows:

All excavation shall be considered unclassified and shall include the removal of all water and materials of any nature, including rock, which interfere with the construction work. Removal of groundwater to a level below the structure subgrade is required.

Supplement as follows:

Excavate the trench to the lines and grades shown or as established by the District with proper allowance for pipe thickness and special bedding when required. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade at no additional cost to the District, with 2½-inch minus crushed rock or gravel reasonably well graded from coarse to fine, and free from excessive topsoil or other organic material.

306-1.1.2 Maximum Length of Open Trench

Amend the first paragraph as follows:

The maximum length of open trench shall be limited to that length that will permit pipe installation, compacted backfilling, and placement of temporary pavement at the end of each working day. Plating will be allowed only at the join points for the next day's work (maximum 20-feet), or as required and/or approved by the local jurisdictional agency.

306-1.1.3 Maximum and Minimum Width of Trench

Supplement first paragraph as follows:

For recycled water pipelines, the overall trench width for pipes with diameter of 12-inches or less shall not be more than 16-inches nor less than 12-inches wider than the outside diameter of the pipe barrel (pipe O.D.) to be laid, therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavation and trenching shall be true to line so that the pipe is centered within the trench and a clear space of not more than 8-inches nor less than 6-inches in width is provided on each side of the pipe O.D.

For recycled water pipelines, the overall trench width for pipes with diameters of 14-inches or greater shall not be more than 24-inches nor less than 16-inches wider than the outside diameter of the pipe barrel (pipe O.D.) to be laid, therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavation and trenching shall be true to line so that the pipe is centered within the trench and a clear space of not more than 12-inches nor less than 8-inches in width is provided on each side of the pipe O.D.

306-1.1.5 Removal and Replacement of Surface Improvements

Amend as follows:

For areas with 36-inches or less of asphalt remaining between the edge of the recycled water line trench and the lip of the existing gutter, the existing asphalt shall be removed to the lip of the gutter.

306-1.1.6 Bracing Excavations

Supplement as follows:

Sheet and brace the trench when necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public. Increase trench widths accordingly by the thickness of the sheeting. Maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone. Shoring and

sheeting shall be removed, as the backfilling is done, in a manner that will not damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the federal, state, or local public agency having jurisdiction. The most stringent of these requirements shall apply.

Add new Subsection as follows:

306-1.1.7 Removal of Subsurface Obstructions

Remove obstructions within the trench area or adjacent thereto such as tree roots, stumps, abandoned piling, buildings and concrete structures, concrete rubble, logs, and debris of all types without additional compensation. The District may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the intended function of the facility. The Contractor shall pay all additional costs or credit the District for any savings resulting from such alignment changes. Dispose of obstructions removed from the excavation in accordance with Subsection 300-1

Add new Subsection as follows:

306-1.1.8 Location of Excavated Materials

During trench excavation, place the excavated material only within the construction easement, right-of-way, or approved working area. Do not obstruct any traveled roadways or streets. Stockpiling excavated material in landscaped or turf areas will not be permitted. The Contractor shall conform to all federal, state, and local codes governing the safe loading of all trenches with excavated material.

306-1.2 Installation of Pipe

306-1.2.1 Bedding

Add a new paragraph at the beginning of this subsection as follows:

All soft, spongy, and unstable material within bottom of the trench shall be removed to a depth not exceeding 2 feet and, as determined by the District, be replaced with 2½-inch minus crushed rock or river gravel, reasonably well graded from coarse to fine and free from excessive topsoil or other organic material.

Amend the fourth and fifth sentence in paragraph three as follows:

Pipe bedding shall be compacted to a minimum of 90 percent relative density. Densify bedding in the pipe zone by hand or mechanical means prior to backfilling above the pipe zone. The densification method shall provide a uniformly compacted embedment of the pipe. Bedding in the pipe zone may be water densified by jetting, only when the

groundwater table is below the subgrade of the pipe base and the soils are porous and well draining and when approved by the District.

Amend the eighth paragraph as follows:

Special bedding shall be provided for all recycled water pipelines, including PVC, steel and ductile iron pipe (DIP). Bedding shall extend 4-inches below the bottom of DIP less than 14-inches in diameter and 6-inches below all steel, PVC and DIP over 14-inches in diameter. Except as provided in the paragraph below, bedding material for all pipes shall have a minimum SE of 30. Bedding shall be imported sand with 100 percent passing a 3/8-inch sieve and not more than 20 percent passing a 200-mesh sieve.

Two-and-one-half-inch minus crushed rock foundation material shall be placed, when groundwater table is above the bedding subbase and when, in the opinion of the District, the ground is insufficiently stable to support the pipe. The required depth below the grade of the bottom of the pipe will be ordered by the District. The crushed rock foundation material shall be carefully placed and sufficiently compacted by tamping so as to provide support without settlement of the pipe. 3/4-inch maximum crushed rock conforming to Subsection 200-1.2 shall be used from the top of the bedding subgrade to the springline of the pipe.

Cement slurry backfill, if required by the District, shall consist of the one sack (94 pounds) Type II Portland cement added per cubic yard of import sand, except within 6-inches of a buried flexible pipe coupling. In which case, use one-half sack (25 pounds) hydrated lime added per cubic yard of imported sand.

306-1.2.2 Pipe Laying

Supplement as follows:

Unless otherwise specified, all pipes shall be transported; handled, and installed in strict accordance with the manufacturer's recommendations and with approved tools and facilities. Pipe laying shall also conform to the requirements of ANSI/AWWA C905 and C900 for PVC pipe, AWWA M11 for steel pipe, and ANSI/AWWA C600 for ductile iron pipe. Pipe shall not be dropped into trench.

306-1.2.6 Field Jointing of Iron Pipe

Supplement with the following:

Ductile iron pipe and ductile iron fittings shall be installed in accordance with the applicable sections of ANSI/AWWA C600 and as specified herein. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Under no conditions shall cable, rope, or other devices used for lowering pipe or fittings be attached through the pipe or fittings interior. Combined deflections at rubber gasket or flexible coupling joints shall not exceed 2 degrees or 75 percent of that recommended

by the manufacturer, if smaller. Fittings shall be supported independently of the pipe. Until thrust blocks and supports are poured, fittings shall be temporarily supported by placing earth mounds or sandbags under the bells so that the pipe is not subjected to the weight of the fitting. All nut and bolt threads shall be lubricated with oil and graphite, "No-Oxide Grease" or "Never-Seize" prior to installation.

306-1.2.13 Installation of Plastic Pipe and Fittings

Supplement with the following :

PVC pipe construction shall conform to AWWA Manual No. M23, "PVC Pipe - Design and Installation," and the manufacturer's installation guide. Combined deflections at PVC pipe joints with factory-assembled bell couplings shall not exceed 2 degrees or 75 percent of that recommended by the manufacturer, if smaller. All fittings and valves shall be supported so that the pipe is not subjected to the weight of those appurtenances.

Add the following Subsection:

306-1.2.14 Flexible Coupling (All Pipe)

Flexible couplings shall be installed according to the following:

- 1) Clean each pipe end for a distance of 6 to 8-inches. Remove oil, dirt, loose scale, and rust so that the gaskets will seat on the pipe barrel to provide a positive seal. Wire brushes or non-oily rags may be used, depending on the condition of pipe ends.
- 2) Slip the follower rings over the pipe ends and slide them back over the cleaned area.
- 3) Wipe the gaskets clean, immerse them in soapy water or approved gasket lubricant, and slide them over the pipe ends.
- 4) Clean the coupling middle ring, paying particular attention to flare on the ends where the gasket will seat. Slip the middle ring entirely over one end of the pipe.
- 5) Position the end of the pipe to be joined to the other pipe such that a 1/2-inch gap is maintained between pipes. Center the coupling middle ring over the gap.
- 6) Lubricate the pipe and the flares of the middle ring with soapy water or gasket lubricant. Slide the gaskets and followers into place making sure the gaskets are pushed under the middle ring flare all the way around.
- 7) Insert the bolts. Nuts should be run on with the rounded or chamfered edge toward the follower ring.

- 8) Wrenching should be done progressively, drawing up the bolts on opposite sides a little at a time and returning to retighten until all bolts have a uniform tightness. During wrenching it is advisable to strike the follower rings with a hammer occasionally to make sure they are seating properly.

Torque application shall be in accordance with the manufacturer's recommendations.

306-1.3 Backfill and Densification

306-1.3.1 General

Delete the seventh paragraph and replaced with the following :

Rocks greater than 3-inches in any dimension will not be permitted in backfill placed between 1 foot above the top of any pipe or box and the bottom of pavement subgrade.

306-1.3.2 Mechanically Compacted Backfill

Supplement the first paragraph by adding the following:

Impact, free fall, or stomping equipment shall not be used for backfill compaction until at least 3 feet of cover is placed over the top of the pipe.

306-1.3.3 Jetted Backfill

Amend as follows:

Water densification of backfill by means of flooding or jetting will not be allowed, except as permitted, in writing, by the District for designated areas. In areas where densified backfill is permitted, it shall be in accordance with the unamended Subsection 306-1.3.3 or as directed by the District.

306-1.3.6 Mechanical Compaction Requirements

Amend as follows:

Delete 1) 85-percent relative compaction:

Insert 1) 90-percent relative compaction:

Except as specified otherwise, trench backfill shall be compacted as required by the permitting agency but in no case less than 90-percent relative compaction.

All pipe and backfill shall be compacted to the minimum relative compaction. Compaction testing will be provided by the District.

306-1.4 Testing Pipelines

306-1.4.1 General

Supplement as follows:

The testing requirements for recycled water pipelines shall be as indicated for water pipelines herein.

306-1.4.5 Water Pressure Test

Supplement as follows:

C = 0.25 for PVC with elastomeric gasket joints

C = 0.25 for DIP and steel with push on joints

It is the responsibility of the Contractor to obtain all water for filling and testing and to remove excess water from the project area. The Contractor is responsible for any damages as a result of testing operations.

The new pipeline shall be swept clean and/or rinsed by hand, as directed by the District, to remove dirt, silt, mud, and any other foreign material from inside the pipeline prior to filling and pressure testing. The Contractor may clean pipelines by flushing with clean water. It is the Contractor's responsibility to obtain and dispose of all flushing water. Pipeline flushing velocity shall not be less than 2.0 ft/sec.

All tests shall be done in the presence of the District. The Contractor shall notify the District not less than forty-eight (48) hours in advance of the actual time of testing so that the District may observe the procedure. All blowoffs, combination air valves, services, and appurtenant facilities shall be tested with the main line pipe.

When the pressure test fails to meet the requirements of the specifications, the Contractor shall make necessary repairs, replacements, or repetition of procedures to conform to the specified requirements at his own expense.

Before testing, the backfill material shall have been compacted to the required compaction to the ground surface. All concrete anchor and thrust blocks shall be allowed to cure sufficient time to develop adequate resistance to thrust developed during testing (minimum three days).

The Contractor shall assume all responsibility for locating leaks and repairing damage to the pipe bedding, backfill, and pavement section resulting from leaks discovered during the pressure test or subsequent pipe failures.

All noticeable leaks shall be stopped regardless of the results of the test and all defective pipes, fittings, valves, and other accessories discovered in consequence of the test shall be removed and replaced. Repair clamps of any kind or type shall not be allowed.

The pump, pipe connection, water, water meter, measuring devices, gauges, and all other equipment, labor, and materials required for performing the leakage test shall be furnished by Contractor. The District may, however, use District's measuring device in place of Contractor's equipment. In case of a difference in the measured leakage rate between the measuring devices, the District's measured leakage shall govern.

The test pressure shall be applied by means of a pump connected to the pipeline in a manner approved by the District. The time duration of the pressure test for different nominal diameter pipeline systems shall be as follows:

<u>Time</u>	<u>Pipe Diameter</u>
4 hours	18-inch diameter pipelines and smaller

The test pressure shall be maintained for the duration of the test. Whenever test pressure falls an amount of 5 psi, it shall be restored. The Contractor may, at his convenience, conduct a preliminary test at any time prior to the District's pressure test. The results of the preliminary test will not be considered by the District.

The test pressure for all pipelines shall be 200 psi as measured at the lowest elevation of the pipeline under test, or as directed by the District. No pipeline shall be tested at less than 200 psi unless authorized, in writing, by the District.

The amount of pipeline footage to be tested at one time shall be determined by the District. The leakage test shall be held concurrently with the pressure test.

Each section of the pipeline to be tested shall be slowly filled with water from the nearest source by means approved by the District. The pipelines shall be filled with water and placed under a light pressure for at least twenty-four (24) hours before the pressure test.

All air shall be vented from all high spots in the pipeline before making any pressure test. If hydrants or other outlets are not available, taps shall be made at the high points to expel the air by the Contractor at his own expense. These taps shall be capped after testing.

All valves shall be tested for leakproof tightness after the mainline pressure test with the test pressure on one side of the valve and atmospheric pressure on the other side.

Add new subsection as follows:

306-9 Recycled Water Pipeline Installation

306-9.1 Connection to Existing Recycled Water Lines

306-9.1.1 General

All connections shall be made in the presence of the District and no connection work shall proceed until the District has given notice to proceed. The Contractor shall furnish all pipe, materials, equipment, and labor required to make the connection, as well as assist the District in alleviating any hardships occurred during the shutdown for connections. Standby equipment or materials may be required by the District. The District may postpone or reschedule any shutdown operation if, for any reason, the District believes that the Contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work. If progress is inadequate during the connection operations to complete the connections in the time specified, the District shall order necessary corrective measures. All costs for corrective measures shall be paid by the Contractor. The District will operate all existing valves. The Contractor shall dewater existing mains, as required, in the presence of the District. The Contractor shall be aware that existing valves (if present) may leak and that the installation of connections may be made under wet conditions. All valves, existing and newly installed, shall be readily accessible at all times to the District for emergency operations.

Contractor shall notify the District a minimum of 10 working days prior to the date of connection. The Contractor shall be responsible for determining in advance the grade, station, and offset of the existing pipelines prior to laying the last 100 feet of the new pipeline. The Contractor, upon approval from the District, shall make necessary cut-to-fit changes, adjusting line and grade as necessary. Where the changes create a high or low point in the pipeline profile, a standard combination air release or blowoff assembly shall be installed if directed by the District. In no event shall the new pipelines be connected to existing facilities until the new pipelines have been successfully pressure tested and flushed.

306-9.1.2 Tapping Sleeves and Valves

Tapping valves shall conform to all requirements for gate valves and the additional requirements listed herein. One end of the tapping valve shall have slotted bolt holes to fit all standard tapping machines. Seat rings shall be oversized to permit the use of full-size cutters. Tapping sleeves shall be Mueller H-615 mechanical joint tapping sleeve, or approved equal. Gaskets shall be Buna-N rubber with a wide cross section. All bolts and nuts shall be stainless steel (316 SS) and coated with two coats of Carbolite Bitumastic No. 50. Double nuts shall be provided on all sleeve bolts. Tap size on existing pipeline shall be minimum one size less and located a minimum of 5-feet from a joint, collar or service. The tapping sleeve shall be installed in accordance

with manufacturer's instructions and to the satisfaction of the District. The pipe barrel shall be thoroughly cleaned with a wire brush to provide a smooth, hard surface for the sleeve. The sleeve shall be pressure tested in the presence of the District prior to tapping. Thrust blocks shall be provided at the tapping sleeve.

306-9.2 Valve Installations

306-9.2.1 General

- 1) The Plans shall show the station, size, type, and end condition of all main line valves. The Standard Drawings show such information for appurtenant installations.
- 2) The Contractor shall install the valves at the locations shown on the Plans and on Standard Drawings.
- 3) Valves shall be installed in a level position with the operating stem vertical, except where shown on the Plans.
- 4) Butterfly valves operators shall be located on the left-hand side of the valve when standing on the flanged end of the valve (at the tee or cross) and looking through the valve toward the pipe end. Otherwise, the operator shall be installed on the street centerline side of the pipeline.
- 5) The Contractor shall coat all buried bolts with two coats of Carboline Bitumastic No. 50, or an approved equal. Wrap buried valves with two wraps of 8-mil polyethylene wrap per ANSI/AWWA C105.
- 6) Valves shall be stabilized and supported separately from the pipeline, as shown on the Plans or on the Standard Drawings.
- 7) Main line and appurtenant valves shall be tested for leak-proof tightness after the main line pressure test, at the test pressure.
- 8) The Contractor shall install valve boxes at all valve locations, except where shown otherwise on the Plans.
- 9) Valve location ties shall be made by the Contractor and shall be measured from the valve to two locations. One set of Plans shall be marked with the tie locations and dimensions and submitted to the District upon completion of the work.
- 10) Tie locations shall be a chiseled "V" on the curb or a white 4-inch by 4-inch witness post set at the property line, or as required by the District.

306-9.2.2 Valve Box Installations

- 1) The Contractor shall install valve box cap and rim, sleeves, and valve operator extensions of the type indicated in the Standard Drawings at each valve location shown on the Plans.
- 2) Operator extensions and sleeves shall be centered and set plumb over the valve operator nut.
- 3) Operator extensions, where required, shall be fitted with an AWWA 2-inch square operating nut and a tapered socket end for the valve operating nut.
- 4) Operator extension shaft, nut, socket, and centering guide shall be painted with one coat of zinc chromate primer after fabrication.
- 5) The valve box caps shall be set flush with finished pavement surface.
- 6) The valve box cap shall be painted with two coats of purple paint according to the requirements of Section 310.

306-9.3 Blowoff Assemblies

306-9.3.1 General

- 1) The Plans shall show the outlet station, size, direction, and location of the outlets.
- 2) The Contractor shall install blowoff installations at the location shown on the Plans and in accordance with Standard Drawings.
- 3) The piping between the outlet valve and the riser shall be at a continuous downgrade of not less than 1/4-inch per foot.
- 4) Where blowoffs are placed in sidewalk areas, the sidewalk shall be saw cut and removed to the nearest score line. The cover shall be set to sidewalk grade and the sidewalk replaced.
- 5) Where blowoffs are placed in unpaved areas, the cover and rim shall be set at the existing ground surface or as directed by the District.

306-9.4 Combination Air Release and Vacuum Valve Assembly

306-9.4.1 General

- 1) The Plans shall show the outlet station, size, direction, and location of the combination air valve assembly.

- 2) The Contractor shall install combination air release and vacuum valve assembly installations at the location shown on the Plans and in accordance with Standard Drawings.
- 3) The piping between the outlet valve and the elbow on the air valve riser shall be at a continuous up grade of 1/4-inch per foot.
- 4) The long axis of the valve shall be set parallel to the street.
- 5) The exposed vent pipe and guard posts, where used, shall be painted according to the requirements of Section 310.
- 6) The number and position of guard posts, when required shall be shown on the Plans or Standard Drawings.
- 7) The tap for the combination air valve shall be made in a level section of the pipe no closer than 18-inches to a bell, coupling, joint, or fitting.

306-9.5 Service Installations

- 1) The Plans shall indicate the recycled water service station, size, direction, and location of the meter box.
- 2) The Contractor shall install recycled water services at the locations shown on the Plans and in accordance with Standard Drawings.
- 3) The Contractor may open cut or bore service laterals as approved by the District.
- 4) Splicing of copper pipe for 1-inch services is not allowed.

306-9.6 Precast Vault, Manhole, and Meter Box Installation

- 1) The Plans or Standard Drawings shall show the station, location, and size of the installation.
- 2) The Contractor shall install precast vaults and manholes at the locations shown on the Plans or Standard Drawings.
- 3) Reinforcement steel shall be Grade 40 or Grade 60 billet steel conforming to ASTM A-615 and shall be deformed according to ASTM A-305.
- 4) Concrete for vaults or meter boxes shall use Type II cement, and shall develop a minimum strength of 3,250 psi at 28 days in conformance to ASTM C-150. All course and fine aggregate shall conform to ASTM C-33.

- 5) Concrete for vault and manhole footings shall be Type II 450-C-2000, and poured against undisturbed or well-compacted soil to the dimensions shown on the Plans or Standard Drawings.
- 6) Manholes
 - (a) Fill joints between precast sections with dry pack crystalline waterproofing plus an outside gun grade elastomeric sealant. The entire manhole shall be waterproof. After backfilling is completed and dewatering is stopped the Contractor shall check for any leakage. All leakage shall be repaired by the Contractor.
 - (b) Set each precast concrete manhole unit plumb on a bed of drypack crystalline to make a watertight joint at least 1-inch thick with the concrete base or with the preceding unit. Point the inside joint and wipe off the excess sealant. Secure the manhole frame to the grade ring with grout and cement mortar fillet. Backfill and compact and replace pavement.
 - (c) Assemble units so that the cover conforms to the elevation determined by the manhole location as follows:
 - (1) In Paved Areas: Top of cover shall be flush with paving surface.
 - (2) In Shoulder Areas: Top of cover shall be flush with existing surface where it is in traveled way of shoulder and 0.1 foot above existing surface where outside limits of traveled way but not in the existing roadside ditch.
 - (d) Backfill and compact around the manholes per Section 300 and pipe specification Section 306.
- 7) Coat interior and exterior of manholes and vaults with crystalline waterproofing per Section 210. The interior surface of the walls and roof shall be coated white. The exterior walls shall be coated gray.

306-9.7 Concrete for Thrust Blocks, Anchors and Pipe Cradles

306-9.7.1 General

- 1) Concrete thrust blocks, anchors, or pipe cradles shall be poured at the locations and with the dimensions shown on the Standard Drawings.
- 2) Portland Cement concrete Type II 450-C-2000 shall be poured against undisturbed soil and shall make positive contact with the pipe with a minimum thickness of 12-inches.

- 3) Sandbags may be used to provide form works for thrust blocks or anchors unless otherwise specified.
- 4) Concrete shall be placed such that bell ends of fittings shall be available for repairs. Concrete placed over joints shall be removed.
- 5) Reinforcing steel exposed directly to the soil shall be coated Carboline Bitumastic No. 50, or approved equal.

306-9.8 Recycled Water Pipeline Identification

All buried PVC, DIP and steel recycled water pipelines shall be identified directly on the pipe by one of the following means as specified in the Standard Drawings:

For PVC Pipe:

1. Purple colored pipe marked with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" on opposite sides of the pipe in accordance with Section 207-25.9.
2. As an alternative to purple colored pipe, purple identification tape with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" may be attached directly to the top of the PVC pipe with plastic adhesive tape in accordance with Section 207-26.13.
3. As an alternative to the two options described above, encase PVC pipe with purple colored polyethylene encasement with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" in accordance with Section 207-26.13.

For DI Pipe:

1. Attach purple colored identification tape with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" directly to the top of the DI pipe and polyethylene encasement with plastic adhesive tape in accordance with Section 207-26.13.
2. As an alternative to purple identification tape, encase DI pipe with purple colored polyethylene encasement with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" in accordance with Section 207-26.13.

For Steel Pipe:

1. Attach purple colored identification tape with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" directly to the top of the steel pipe with plastic adhesive tape in accordance with Section 207-26.13.

In addition to the above identification requirements, all PVC, DIP and steel buried recycled water pipelines shall have purple colored warning tape placed in the trench 12-inches

above the pipe with the wording **CAUTION: RECYCLED WATER LINE BELOW** in accordance with Section 207-26.13 and the Standard Drawings.

SECTION 310 - PAINTING

310-1 General

310-1.5 Painting Schedule

Add as follows:

<u>Item</u>	<u>Color</u>	<u>No. of Coats</u>
Valve Box Covers	Purple	2
Air Valve Blowoff Valves	Purple	2
Vault Covers (Top)	Zinc Chromate Primer Aluminum	1
Vault Covers (Underside)	Carboline Bitumastic No. 50	2
Piping and Valves (In Vault)	Tnemec 66	2
Guard Posts	Safety Yellow	2
Aboveground or Exposed Pipe	See Section 310-6.5	---

Add new Subsection as follows:

310-6 Protective Coatings (Ferrous Metals)

310-6.1 General

The Contractor shall furnish all material, labor, and equipment necessary to line and coat all piping, valves, fittings, pipe hangers, and other ferrous metal surfaces not shop lined and coated.

310-6.2 Surface Preparation

All ferrous surfaces to receive protective coatings shall be sandblasted to commercial standards per Subsection 310-2.5 of the Standard Specifications prior to the application of coatings. All surface irregularities such as weld spatter, sharp corners, rough welds, etc.,

shall be ground smooth. All surfaces shall be completely free of grease, oil, and other foreign material.

310-6.3 Interior of Ferrous Surfaces

The interior surfaces of iron pipe and fittings shall be cement lined in accordance with the latest revised edition of ANSI/AWWA C104.

310-6.4 Buried Exterior of Ferrous Surfaces

310-6.4.1 Field Coat

All buried ferrous metal fittings and joints (valves, couplings, flanges, etc.) in contact with the soil shall be coated with one (1) coat of Super Tank Solution or Carboline Bitumastic No. 50 after assembly to the main line pipe, or approved equal.

310-6.4.2 Polyethylene Encasement

All ductile iron pipe, fittings, and valves shall be encased with two wraps of minimum 8-mil polyethylene sheeting in accordance with ANSI/AWWA C105/A21.5.

310-6.5 Above Ground or Exposed Pipeline

Pipelines which will be above ground or permanently exposed to the environment will be prepared and coated using a Zinc Rich Primer/Epoxy/Urethane coating system as follows:

310-6.5.1 Preparation

Surfaces may be shop primed and coated or field coated. Preparation of metal surfaces shall be in accordance with the manufacturer's recommendations and in accordance with SSPC SP-10, "Near White Blast Cleaning".

Coated surfaces damaged during shop priming or installation shall be prepared and recoated in accordance with the coating manufacturer's recommendations and these specifications.

310-6.5.2 Coating System

The coating system shall be a 3-coat system as follows, or approved equal:

- 1) Primer: Tnemec; Series 90-97, "TnemeZinc," Zinc Rich Urethane Primer - 3 mils.
- 2) Intermediate: Tnemec; Series 66, "Hi-Build Epoxoline," Epoxy - Polyamide Coating - 4 mils.

- 3) Finish: Tnemec; Series 1075 "Endura-Shield II", Hi-Build Acrylic Polyurethane Enamel -4 mils.

310-6.5.3 Inspection

- 1) Shop primed or factory finished items shall be inspected at the job site before further painting or coating. Areas of chipped, peeled, or abraded coating shall be hand or power sanded, feathering the edges, then spot primed and coated in accordance with these requirements.
- 2) Contractor shall provide scaffolding and testing equipment to permit inspection.
- 3) Color shall be selected by the District's representative from submitted paint samples of the manufacturer's standard colors

New Subsection added as follows:

310-7 Waterproofing (Concrete)

310-7.1 General

The Contractor shall furnish all material, labor and equipment necessary to waterproof the interior and exterior of all manholes and vaults.

310-7.2 Surface Preparation

- 1) Do not treat concrete surfaces with chemical hardeners or curing agents prior to the application of waterproofing.
- 2) Examine surfaces to be waterproofed for form tie holes and structural defects, such as honeycombing, rock pockets, faulty construction joints, cracks, etc. Repair these areas in accordance with Section 303.
- 3) Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean, free from scale, form oil, latency, curing compounds, and any other foreign matter. Lightly sandblast, water blast, or acid etch with muriatic acid (15% to 20%) to provide a clean absorbent surface. Saturate surfaces to be acid etched with water prior to application of acid. Vertical surfaces may have a sacked finish. Do not apply a slurry coat of water materials to horizontal concrete deck surfaces that are less than 20 hours old.
- 4) Use light sandblasting or etching to remove the surface glaze of dense or steel troweled concrete.
- 5) Abrasive clean and wash construction joints.

310-7.3 Application

- 1) After completing repairs, apply a top-coat system to the concrete surfaces to be treated, apply after curing and finishes are complete. Application of waterproofing and any paint top coatings shall conform to the manufacturers recommended application procedures.
- 2) The Contractor shall have the manufacturer's representative advise and/or supervise the waterproofing application in person.
- 3) Apply crystalline waterproofing material to concrete, which has been thoroughly saturated with clean water. Moisten surfaces to be treated prior to application. Remove free water prior to application of waterproofing material.
- 4) Apply crystalline waterproofing to:
 - (a) Interior walls and roof of concrete vaults and manholes. Exterior walls of concrete vaults and manholes.
 - (b) Joints of precast concrete manholes as shown on the Plans.
 - (c) The interior surfaces shall have a white color and the exterior a gray color.
- 5) Apply second coat when the first coat has reached an initial set. Use light water spray on surfaces to be coated if rapid drying occurs.

310-7.4 Backfilling

- 1) Do not backfill against structures for at least seven days after application of waterproofing.
- 2) Prior to backfilling, check treated surfaces for newly developed cracks. Repair cracks and cure surface for 48 hours before backfilling. Do not backfill with dry material until after complete cure of coating.

*** END OF SECTION ***

DEFINITIONS

Whenever the following words, phrases, or pronouns used in their place, occur in these Standard Specifications, or in any documents that these Standard Specifications govern, the intent and meaning shall be interpreted as follows:

Air-Gap Separation: A physical break between a supply pipe and a receiving vessel. The air gap shall be at least double the diameter of the supply pipe, measured vertically above the top rim of the vessel, and in no case less than one inch.

Approved Backflow Preventer: A device installed to protect the Potable Water supply from contamination by Recycled Water, such as Treated Wastewater. This device shall be approved by the SDHS and the Distributor in conformance with Title 17.

AWWA: The American Water Works Association.

AWWA Guidelines: American Water Works Association Guidelines for Distribution of Nonpotable Water, California-Nevada Section, latest edition.

AWWA Standards: American Water Works Association Standards for Construction Materials, latest edition.

CBMWD: Central Basin Municipal Water District.

Contractor: A Person(s) or firm entering into a legal agreement with a Supplier, Distributor, Owner, or User for the performance of Work on all or any portion of facilities subject to these Specifications.

Discharge Permit: A permit issued by the Los Angeles RWQCB for the Discharge of Recycled Water.

District: The West Basin Municipal and Central Basin Municipal Water Districts.

Inspector: Any Person(s) authorized to perform inspection of either onsite or Offsite Facilities prior to construction, during construction, after construction and during operation.

Off site Facilities: Existing or proposed facilities under the control of the Supplier or Distributor, from the source of supply to the point of connection with the User's Onsite Facilities, normally up to and including the Distributor's meter and meter box.

Onsite Facilities: Existing or proposed facilities within property under the control of the User, normally downstream of the Distributor's meter.

Owner: Any holder of legal title, contract purchaser, or lessee under a lease with an unexpired term of more than one (1) year, of property for which Recycled Water Service has been requested or established.

Pantone: Color standard system.

Plans: The plans, working drawings, detail drawings, profiles, typical cross sections and supplemental drawings or reproductions thereof which show locations, character, dimensions or details of the Work.

Recycled Water: As defined in Title 22, Division 4, Chapter 3, of the California Code of Standard Specifications, water which as a result of treatment of wastewater, is suitable for direct beneficial use or a controlled use that otherwise would not occur. The treatment of wastewater is accomplished in accordance with the criteria set forth in the code.

Service: The furnishing of recycled water to a user through a metered connection to the onsite facilities.

Service Connection: The facilities between the Recycled Water distribution system and the customer's Recycled Water Service valve, including, but not limited to, the meter, meter box, valves, and piping equipment.

Standard Specifications: Specifications adopted by the District for construction of water and recycled water facilities.

SDHS: State Department of Health Services.

User: Any Person, group, firm, partnership, corporation, association or agency accepting Recycled Water from the Distributor's Recycled Water facilities for use in accordance with these Standard Specifications.

Work: The entire improvement proposed to be constructed pursuant to a legal agreement and consistent with these Standard Specifications.

WBMWD: West Basin Municipal Water District.

ABBREVIATIONS

List of General Abbreviations

A	Area
AASHTO	American Association of State Highway and Transportation Officials
AB	Anchor Bolt/Aggregate Base
ABAN	Abandoned
ABC	Asphalt Base Course
ABT	About
AC	Acce/Asphaltic Concrete
ACI	American Concrete Institute
ACP	Asbestos-Cement Pipe
ADDL	Additional
AHD	Ahead
AI	The Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AL	Aluminum
ALIGN	Alignment
ALTN	Alternate
ANCH	Anchor
ANG	Angle
ANSI	American National Standards Institute
APPROX	Approximate
APWA	American Public Works Association
ARCH	Architecture/Architectural
AREA	American Railway Engineering Association
ARV	Air-Release Valve
ARVV	Air-Release/Vacuum Valve Abbreviation Term
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASPH	Asphalt
ASSY	Assembly
ASTM	American Society of Testing and Materials
AVE	Avenue
AVG	Average
AWG	American Wire Gauge
AWS	American Welding Society
AWWA	American Water Works Association
BC	Beginning of Curve
BCR	Begin Curb Return
BEG	Begin
BETW	Between

BF	Blind Flange
BK	Back
BL	Base Line
BLDG	Building
BLK	Block
BM	Bench Mark/Beam
BO	Blowoff
BOCA	Building Officials Code Administration International, Inc.
BOT	Bottom
BRG	Bearing
BUR CBL	Buried Cable
BV	Butterfly Valve
BVC	Begin Vertical Curve
BW	Block Wall

C	Conduit
CAB	Crushed Aggregate Base
CALTRANS	California Department of Transportation
CAP	Capacity
CATV	Cable Television
CB	Catch Basin
C-C	Center-to-Center
CCB	Concrete Block
CCP	Concrete Cylinder Pipe
CD	Cross Drain
CEM	Cement
CF	Cubic Feet/Curb Face
CFH	Cubic Feet Per Hour Abbreviation Term
CFM	Cubic Feet Per Minute
CFS	Cubic Feet Per Second
C & G	Curb and Gutter
CHG	Change
CHKD PL	Checkered Plate
CI	Cast Iron
CIP	Cast in Place/Cast-Iron Pipe
CISP	Cast Iron Soil Pipe
CISPI	Cast-Iron Soil Pipe Institute
CJ	Construction Joint
CL	Centerline/Class/Clearance
CLR	Clear
CMC	Cement-Mortar Coated or Coating
CML	Cement-Mortar Lined or Lining
CMLCSP	Cement-Mortar Lined and Coated Steel Pipe
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CMU	Concrete Masonry Unit

CO	Cleanout/Conduit Only
COL	Column
COMPL	Complete
CONC	Concrete
CONN	Connection
CONST	Construct or Construction
CONT	Continuous
CONTR	Contractor
COORD	Coordinate/Coordinated
COP	Copper
COR	Corner
CPLG	Coupling
CRES	Corrosion Resistant Steel
CRSI	Concrete Reinforcing Steel Institute
CS	Carbon Steel/Commercial Standard
CSP	Corrugated Steel Pipe
CT	Center Top
CTG	Coating
CTR	Center
CTV	Cable Television
CULV	Culvert
CU YD,	CY Cubic Yard
CYL	Cylinder
D	Degree of Curvature
DB	Direct Buried
DBL	Double
DEPT	Department
DET	Detail/Detour
DI	Drop Inlet/Ductile Iron Abbreviation Term
DIA	Diameter
DIM	Dimension
DIMJ	Ductile-Iron Mechanical Joint
DIP	Ductile-Iron Pipe
DIPRA	Ductile-Iron Pipe Research Association
DISCH	Discharge
DIST	Distance
DMH	Drop Manhole
DN	Down
DR	Drain/Door
DWG	Drawing
DWY	Driveway
E	East
EA	Each
EC	End of Curve

ECC	Eccentric
ECR	End of Curb Return
ED	External Distance
EE	Each End
EF	Each Face
EFF	Efficiency
EFL	Effluent
EGL	Energy Grade Line
EL	Elevation
E/L	Easement Line
ELEC	Electric
ELEV	Elevation
ELP	Elliptical
ENC	Encasement
ENCL	Enclosure
EOP	Edge of Pavement
EOS	Equivalent Opening Size
EP	Edge of Pavement
EPA	Environmental Protection Agency (Federal)
EQ	Equation
EQL	Equal
ESMT	Easement
EST	Estimate or Estimated
ETC	And so Forth
EVC	End Vertical Curve
EW	Each Way
EXC	Excavate or Excavation
EXP	Expansion
EXST	Existing
EXT	Exterior/Extension Abbreviation Term

F	Fahrenheit/Floor
FAB	Fabricate
FCO	Floor Cleanout
FCV	Flow Control Valve
FD	Floor Drain
FE	Flanged End
FF	Finished Floor/Flat Face
FG	Finished Grade
FHY	Fire Hydrant
F&I	Furnish and Install
FIG	Figure
FIN	Final
FIT	Fitting
FL	Floor/Flow Line
FLG	Flange

FM	Force Main/Factory Mutual
FNSH	Finish
FPC	Flexible Pipe Coupling
FPM	Feet Per Minute
FPS	Feet Per Second
FPT	Female Pipe Thread
FS	Finished Surface/Federal Specifications
FT	Feet or Foot
FTG	Footing
FUT	Future
FWY	Freeway

G	Gas
GA	Gauge
GAL	Gallon
GALV	Galvanized
GB	Grade Break
GDR	Guard Rail
GE	Grooved End
GENL	General
GM	Gas Main
GND	Ground
GPD	Gallons Per Day
GPM	Gallons Per Minute
GR	Grade
GRTG	Grating
GSKT	Gasket
GUT	Gutter
GV	Gate Valve Abbreviation Term

HARN	Harness
HB	Hose Bibb
HD	Heavy Duty
HDPE	High Density Polyethylene
HGL	Hydraulic Grade Line
HGT	Height
HORIZ	Horizontal
HP	High Pressure
HPT	High Point
HR	Hour/Handrail
HS	High Strength
HV	Hose Valve
HVY	Heavy
HW	Headwall
HWL	High Water Level
HWY	Highway

HYDR	Hydraulic
I	Intersection Angle Officials
ID	Inside Diameter
IE	Invert Elevation
IN	Inches
INCL	Include
INL	Inlet
INS	Insulating
INSTL	Install or Installation
INTR	Interior/Intersection
INV	Invert
IP	Iron Pipe
IPS	Iron Pipe Size
IPT	Iron Pipe Thread
IRR	Irrigation
JCT	Junction
IN	Join
JT	Joint
KIPS	Thousands of Pounds Abbreviation Term
L	Length of Curve/Long/Left
LATL	Lateral
LB	Pound
LF	Linear Foot
LG	Long
LOC	Location/Locate
LP	Light Pole
LPT	Low Point
LR	Long Radius
LS	Lift Station
LT	Left/Light
LWL	Low Water Level
MATL	Material
MAX	Maximum
MB	Machine Bolt
MECH	Mechanical
MFR	Manufacturer
MG	Million Gallons/Milligram
MGD	Million Gallons Per Day
MH	Manhole
MI	Malleable Iron/Mile
MIL	Military Specifications

MIN	Minimum
MISC	Miscellaneous
MJ	Mechanical Joint
MOD	Modification
MON	Monument
MPT	Male Pipe Thread
MSL	Mean Sea Level
MSS	Manufacturer's Standardization Society
N	North
NA	Not Applicable
NBFU	National Board of Fire Underwriters
N & C	Nail and Cap
NC	Normally Closed
NE	Northeast
NIC	Not in Contract
NIP	Nipple
NO	Number/Normally Open
NOM	Nominal Abbreviation Term
NPT	National Pipe Taper
NRS	Nonrising Stern
NTS	Not to Scale
NW	Northwest
NWL	Normal Water Level
OA	Overall
OC	On Center
OD	Outside Diameter
OE	Or Equal
OF	Outside Face
OPNG	Opening
OPP	Opposite
ORIG	Original
OSHA	Occupational Safety and Health Administration
OVFL	Overflow
P	Pole
PC	Point of Curvature
PCA	Portland Cement Association
PCC	Point of Compound Curvature/Portland Cement Concrete
PE	Plain End/Polyethylene/Professional Engineer
PI	Point of Intersection
PKWY	Parkway
PL	Plate/Property Line
PLF	Pounds Per Lineal Foot
POB	Point of Beginning

POC	Point of Connection
POJ	Push-On Joint
PP	Power Pole/Polypropylene
PRC	Point of Reverse Curve
PRESS	Pressure
PRL	Parallel
PROV	Provisions
PRPSD	Proposed
PRVC	Point of Reverse Vertical Curve
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gauge
PSF	Pounds Per Square Foot
PT	Point of Tangency
PV	Plug Valve
PVC	Polyvinyl Chloride Abbreviation Term
PVMT	Pavement

Q	Flow Rate
QTY	Quantity

R	Right/Radius
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
RD	Road
ROC	Reduce
RDCR	Reducer
REF	Reference
REINF	Reinforce or Reinforced
RELOC	Relocated
REQ	Required/Requirement
REQD	Required
RF	Raised Face
RND	Round
RJ	Restrained Joint
RPM	Revolutions Per Minute
RR	Railroad
RST	Reinforcing Steel
RT	Right
RW	Recycled Water
R/W	Right-of-Way

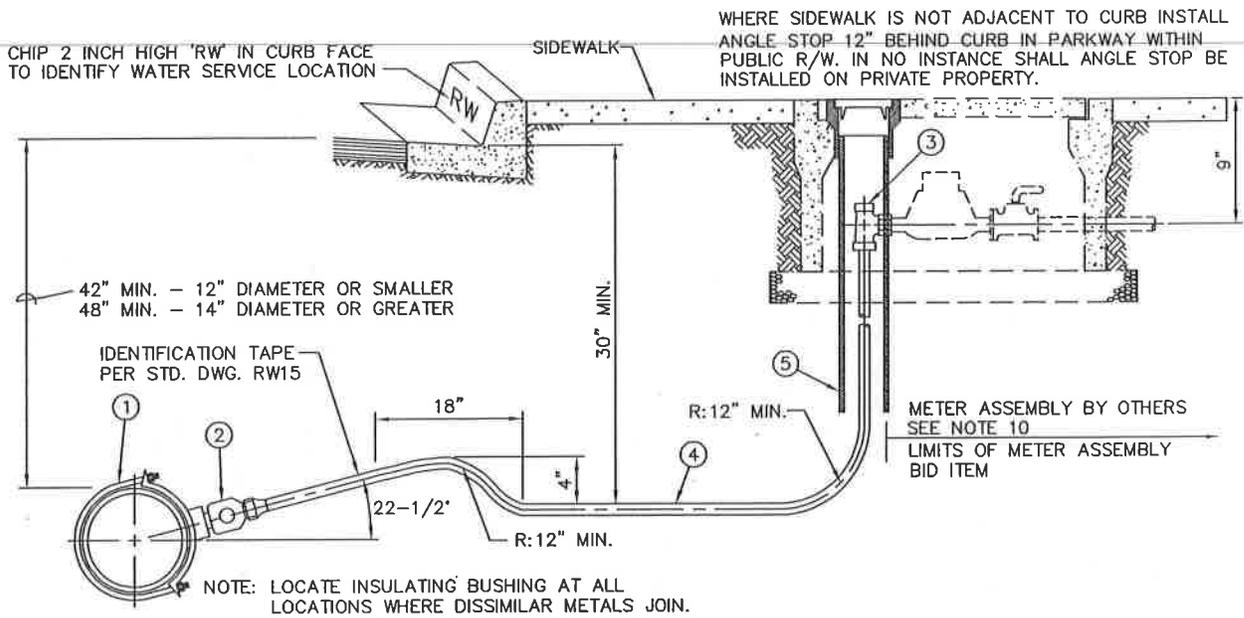
S	South/Slope in Feet Per Foot/Sewer
SAN	Sanitary
SCHED	Schedule
SO	Storm Drain

SDG	Siding
SDWK	Sidewalk
SE	Southeast
SECT	Section
SF	Square Feet
SGL	Single
SH	Sheet/Sheeting
SIM	Similar
SLP	Slope
SLV	Sleeve
SOL	Solenoid
SOV	Solenoid-Operated Valve Abbreviation Term
SP	Steel Pipe
SPCG	Spacing
SPEC	Specification
SPLC	Splice
SPRT	Support
SQ	Square
SQ FT	Square Feet
SR	Short Radius
SS	Sanitary Sewer
SSPC	Steel Structures Painting Council
SST	Stainless Steel
ST	Street
STA	Station
STD	Standard
STK	Stake
STL	Steel
STR	Straight
STRL	Structural
STRUCT	Structure
SURF	Surface
SW	Southwest
SYMM	Symmetrical
SYS	System

T	Tangent Length of Curve/Telephone
TAN	Tangent
TB	Top of Bank
T & B	Top and Bottom
TBG	Tubing
TBM	Temporary Bench Mark
TC	Top of Curb
TDH	Total Dynamic Head
TEL	Telephone
TEMP	Temperature/Temporary

THB	Thrust Block
THD	Thread or Threaded
THH	Thrust Harness
THK	Thick
T/O	Top of
TOC	Top of Concrete
TOS	Top of Slab
TOT	Total
TP	Telephone Pole
TV	Television
TYP	Typical Abbreviation Term
UBC	Uniform Building Code
UD	Underdrain
UG	Underground
UL	Underwriters' Laboratories, Inc.
UNO	Unless Noted Otherwise
UTC	Underground Telephone Cable
V	Vent/Valve/Volt
VC	Vertical Curve
VCP	Vitrified Clay Pipe
VEL	Velocity
VERT	Vertical
VOL	Volume
VPC	Vertical Point of Curve
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangency
W	West/Wide/Water
W/	With
WL	Waterline
WLD	Welded
WM	Water Meter
W/O	Without
WSE	Water Surface Elevation
WT	Weight
WTR	Water
WWF	Welded Wire Fabric
WWM	Woven Wire Mesh
YD	Yard
YR	Year
YS	Yield Strength

APPENDIX B
WBMWD STANDARD DRAWINGS



CONSTRUCTION ITEMS / MATERIALS LIST			
ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	SERVICE SADDLE WITH CC THR'D. FOR: POLYVINYL-CHLORIDE PIPE (PVC) DUCTILE-IRON PIPE (D.I.P.)	MUELLER JAMES JONES MUELLER FORD	H-13000 SERIES J-996 DR 2A SERIES F-202B
②	1" BRONZE CORPORATION STOP, INSULATING BUSHING	MUELLER JAMES JONES	H-15000 J-1930
③	1" BRONZE ANGLE BALL METER VALVE WITH LOCKWING	FORD MUELLER JAMES JONES	BA 23-444W B-24255 J-1964W
④	1" COPPER TUBING	---	TYPE "K" SOFT
⑤	VALVE BOX AND COVER PER STANDARD DRAWING RW7	---	---

NOTE:

- DOUBLE STRAP SERVICE SADDLE FOR ALL MAINS.
- INSTALL CORPORATION STOP WITH KEY SIDEWAYS, IN OPEN POSITION (FOR HOT TAP).
- THE CORPORATION STOP TAP WILL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER. ALL DRY TAPS WILL BE MADE USING MACHINE GUIDE OR PILOT TAP.
- THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP EXCEPT IN CUL-DE-SAC ENDS, WHERE NON-PERPENDICULAR INSTALLATION IS ALLOWED.
- NO TAP TO MAIN SHALL BE WITHIN 24" OF VALVE, COUPLING, JOINT, OR FITTING.
- NO SPLICES WILL BE PERMITTED BETWEEN CORPORATION STOP AND ANGLE METER STOP EXCEPT WHEN SERVICE RUN EXCEEDS 60 FEET, IN WHICH CASE A SILVER SOLDER COUPLING SHALL BE USED.
- SERVICE TERMINATION POINT SHALL NOT BE PLACED IN DRIVEWAYS.
- WARNING TAG SHALL BE PLACED ON THE METER.
- TRENCH BACKFILL SHALL BE ONE SACK SLURRY (100-E-100) AS REQUIRED BY LOCAL JURISDICTIONAL AGENCY/CITY, UNLESS OTHERWISE SHOWN.
- METER BOX AND ASSEMBLY TO BE FURNISHED AND INSTALLED BY PURVEYOR.
- ALL SWEAT FITTINGS SHALL BE ASSEMBLED WITH SILVER SOLDER.
- FINAL LOCATION OF METER ASSEMBLY SHALL BE CONFIRMED WITH THE DISTRICT AND THE PURVEYOR PRIOR TO CONSTRUCTION.

REVISION	DRAWN	APP'D.	DATE
MARCH 2010			
APPROVED			
DISTRICT ENGINEER		RCE	DATE

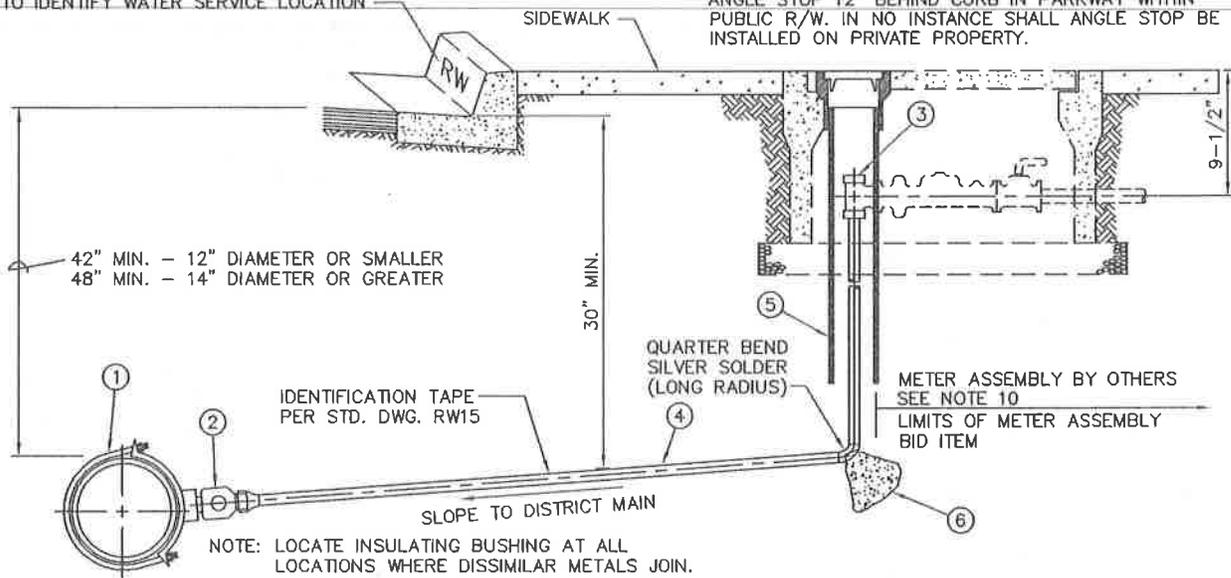
WEST BASIN MUNICIPAL WATER DISTRICT

1-INCH RECYCLED WATER SERVICE

STANDARD
DRAWING
RW1

CHIP 2 INCH HIGH 'RW' IN CURB FACE TO IDENTIFY WATER SERVICE LOCATION

WHERE SIDEWALK IS NOT ADJACENT TO CURB INSTALL ANGLE STOP 12" BEHIND CURB IN PARKWAY WITHIN PUBLIC R/W. IN NO INSTANCE SHALL ANGLE STOP BE INSTALLED ON PRIVATE PROPERTY.



CONSTRUCTION ITEMS / MATERIALS LIST

ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	SERVICE SADDLE WITH CC THR'D. FOR: POLYVINYL-CHLORIDE PIPE (PVC) DUCTILE-IRON PIPE (D.I.P.)	MUELLER JAMES JONES MUELLER FORD	H-13000 SERIES J-996 DR 2A SERIES F-202B
②	1-1/2" BRONZE CORPORATION STOP, INSULATING BUSHING	MUELLER JAMES JONES	H-15000 J-1930
③	1-1/2" BRONZE ANGLE BALL METER VALVE WITH LOCKWING	FORD MUELLER JAMES JONES	FV23-777W B-24286 J-1973W
④	1-1/2" COPPER TUBING	---	TYPE "K" SOFT
⑤	VALVE BOX AND COVER PER STANDARD DRAWING RW7	---	---
⑥	THRUST BLOCK -- 0.7 CU. FT.	---	---

NOTE:

- DOUBLE STRAP SERVICE SADDLE FOR ALL MAINS.
- INSTALL CORPORATION STOP WITH KEY SIDEWAYS, IN OPEN POSITION (FOR HOT TAP).
- THE CORPORATION STOP TAP WILL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER. ALL DRY TAPS WILL BE MADE USING MACHINE GUIDE OR PILOT TAP.
- THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP EXCEPT IN CUL-DE-SAC ENDS, WHERE NON-PERPENDICULAR INSTALLATION IS ALLOWED.
- NO TAP TO MAIN SHALL BE WITHIN 24" OF VALVE, COUPLING, JOINT, OR FITTING.
- NO SPLICES WILL BE PERMITTED BETWEEN CORPORATION STOP AND ANGLE METER STOP EXCEPT WHEN SERVICE RUN EXCEEDS 60 FEET, IN WHICH CASE A SILVER SOLDER COUPLING SHALL BE USED.
- SERVICE TERMINATION POINT SHALL NOT BE PLACED IN DRIVEWAYS.
- WARNING TAG SHALL BE PLACED ON THE METER.
- TRENCH BACKFILL SHALL BE ONE SACK SLURRY (100-E-100) AS REQUIRED BY LOCAL JURISDICTIONAL AGENCY/CITY, UNLESS OTHERWISE SHOWN.
- METER BOX AND ASSEMBLY TO BE FURNISHED AND INSTALLED BY PURVEYOR.
- ALL SWEAT FITTINGS SHALL BE ASSEMBLED WITH SILVER SOLDER.
- FINAL LOCATION OF METER ASSEMBLY SHALL BE CONFIRMED WITH THE DISTRICT AND THE PURVEYOR PRIOR TO CONSTRUCTION.

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MARCH 2010			
APPROVED			
DISTRICT ENGINEER	RCE		DATE

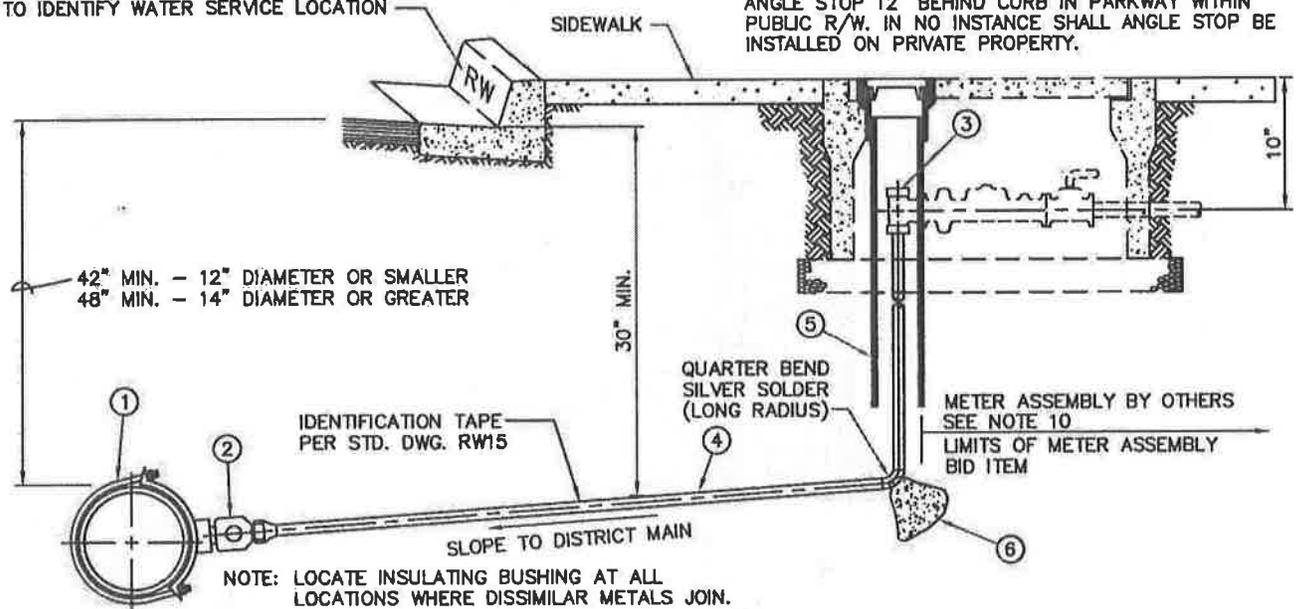
WEST BASIN MUNICIPAL WATER DISTRICT

1-1/2-INCH RECYCLED WATER SERVICE

STANDARD DRAWING
RW2

CHIP 2 INCH HIGH 'RW' IN CURB FACE TO IDENTIFY WATER SERVICE LOCATION

WHERE SIDEWALK IS NOT ADJACENT TO CURB INSTALL ANGLE STOP 12" BEHIND CURB IN PARKWAY WITHIN PUBLIC R/W. IN NO INSTANCE SHALL ANGLE STOP BE INSTALLED ON PRIVATE PROPERTY.



NOTE: LOCATE INSULATING BUSHING AT ALL LOCATIONS WHERE DISSIMILAR METALS JOIN.

CONSTRUCTION ITEMS / MATERIALS LIST

ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	SERVICE SADDLE WITH CC THR'D. FOR: POLYVINYL-CHLORIDE PIPE (PVC) DUCTILE-IRON PIPE (D.I.P.)	MUELLER JAMES JONES MUELLER FORD	H-13000 SERIES J-996 DR 2A SERIES F-202B
②	2" BRONZE CORPORATION STOP, INSULATING BUSHING	MUELLER JAMES JONES	H-15000 J-1930
③	2" BRONZE ANGLE BALL METER VALVE WITH LOCKWING	FORD MUELLER JAMES JONES	FV23-777W B-24286 J-1973W
④	2" COPPER TUBING	---	TYPE "K" SOFT
⑤	VALVE BOX AND COVER PER STANDARD DRAWING RW7	---	---
⑥	THRUST BLOCK - 0.7 CU. FT.	---	---

NOTE:

- DOUBLE STRAP SERVICE SADDLE FOR ALL MAINS.
- INSTALL CORPORATION STOP WITH KEY SIDEWAYS, IN OPEN POSITION (FOR HOT TAP).
- THE CORPORATION STOP TAP WILL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER. ALL DRY TAPS WILL BE MADE USING MACHINE GUIDE OR PILOT TAP.
- THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP EXCEPT IN CUL-DE-SAC ENDS, WHERE NON-PERPENDICULAR INSTALLATION IS ALLOWED.
- NO TAP TO MAIN SHALL BE WITHIN 24" OF VALVE, COUPLING, JOINT, OR FITTING.
- NO SPLICES WILL BE PERMITTED BETWEEN CORPORATION STOP AND ANGLE METER STOP EXCEPT WHEN SERVICE RUN EXCEEDS 60 FEET, IN WHICH CASE A SILVER SOLDER COUPLING SHALL BE USED.
- SERVICE TERMINATION POINT SHALL NOT BE PLACED IN DRIVEWAYS.
- WARNING TAG SHALL BE PLACED ON THE METER.
- TRENCH BACKFILL SHALL BE ONE SACK SLURRY (100-E-100) AS REQUIRED BY LOCAL JURISDICTIONAL AGENCY/CITY, UNLESS OTHERWISE SHOWN.
- METER BOX AND ASSEMBLY TO BE FURNISHED AND INSTALLED BY PURVEYOR.
- ALL SWEAT FITTINGS SHALL BE ASSEMBLED WITH SILVER SOLDER.
- FINAL LOCATION OF METER ASSEMBLY SHALL BE CONFIRMED WITH THE DISTRICT AND THE PURVEYOR PRIOR TO CONSTRUCTION.

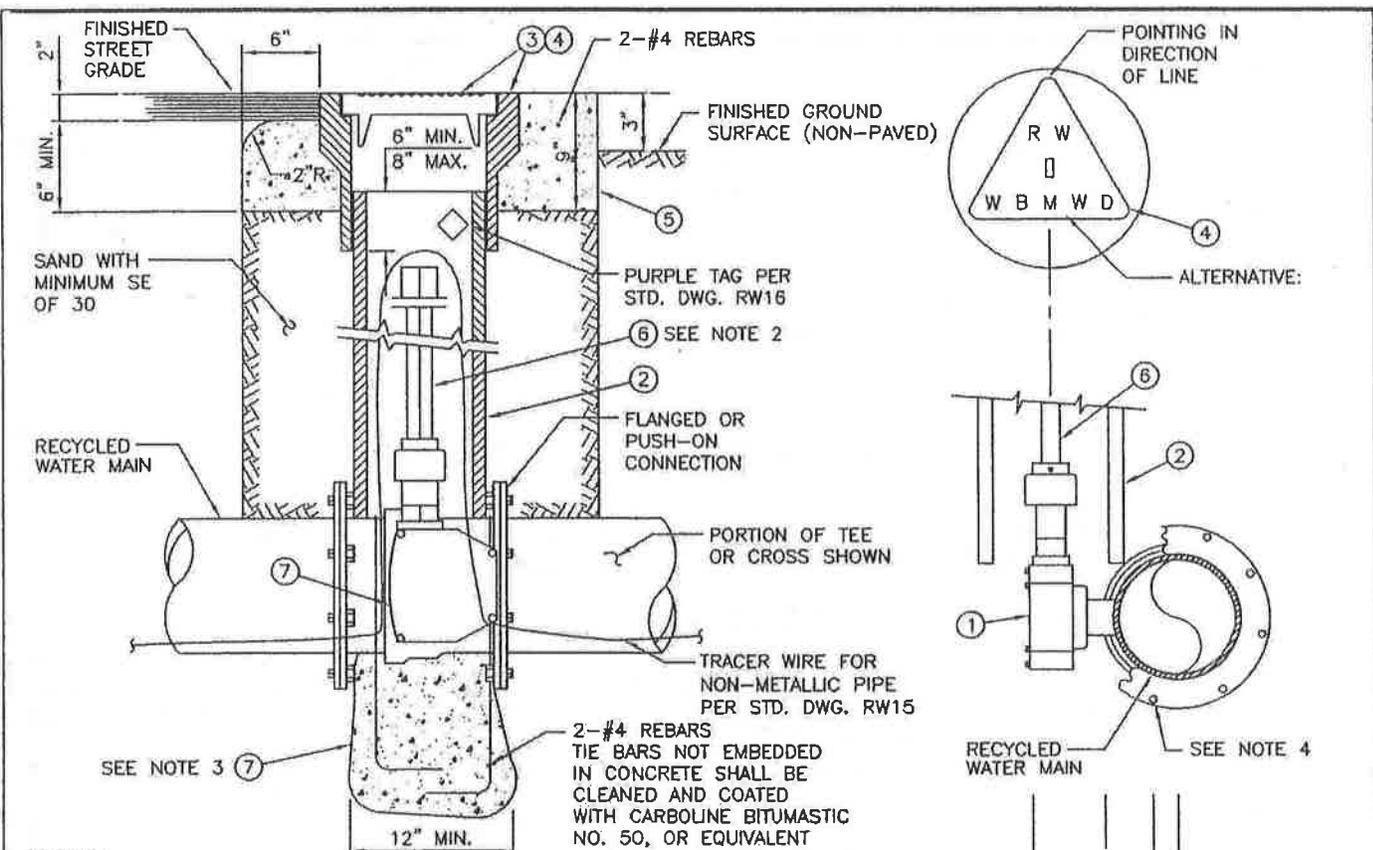
REVISION	DRAWN	APP'D.	DATE
MARCH 2010			
APPROVED			
DISTRICT ENGINEER		RCE	DATE

WEST BASIN MUNICIPAL WATER DISTRICT

2-INCH RECYCLED WATER SERVICE

STANDARD
DRAWING
RW3

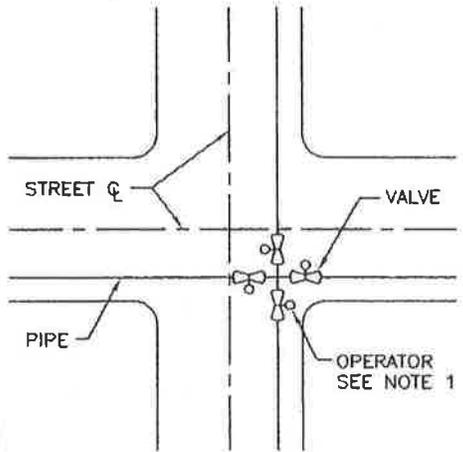
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NOTES:

1. BUTTERFLY VALVE OPERATORS SHALL BE LOCATED ON THE LEFT HAND SIDE OF THE VALVE WHEN STANDING ON THE FLANGED END OF THE VALVE (AT THE TEE OR CROSS) AND LOOKING THROUGH THE VALVE TOWARD THE PIPE END. AT STREET INTERSECTIONS WHERE VALVE BOX LOCATION MAY INTERFERE WITH PROPOSED CONCRETE CROSS GUTTER, PIPELINE SHALL BE MOVED AWAY FROM STANDARD LOCATION AS REQUIRED PER DETAIL HEREON.
2. PROVIDE VALVE STEM EXTENSION IF DEPTH TO VALVE NUT EXCEEDS 4 FEET.
3. ANCHOR BLOCK REQUIRED AT ALL TIMES. ANCHOR BLOCK SHALL BE TRENCH WIDTH PLUS TWO PIPE DIAMETERS WIDE AND SHALL EXTEND VALVE SIZE PLUS SIX INCHES BELOW BOTTOM OF TRENCH.
4. ALL CONTRACTOR PROVIDED BURIED BOLTS SHALL BE 316 STAINLESS STEEL AND COATED WITH CARBOLINE BITUMASTIC NO. 50 OR EQUIVALENT.

CONSTRUCTION ITEMS / MATERIALS LIST			
ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	BUTTERFLY VALVE OR RESILIENT WEDGE GATE VALVE PER STD. SPECIFICATIONS	---	---
②	8" PVC SDR35 PIPE	---	---
③ ④	10 1/4" BODY AND COVER (BOX LID)	BROOKS	4-TT
⑤	CONCRETE RING, CLASS 560-C-3250	---	---
⑥	VALVE STEM EXTENSION PER STANDARD DRAWING RW8 (SEE NOTE 2)	---	---
⑦	ANCHOR BLOCK PER STANDARD DRAWING RW19 (SEE NOTE 3)	---	---



BUTTERFLY VALVE OPERATOR POSITIONS

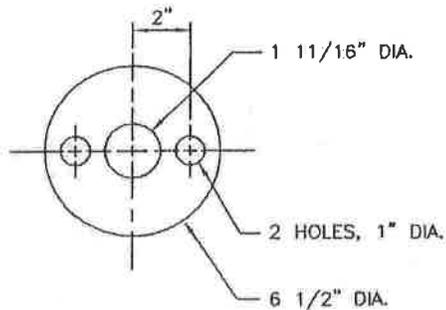
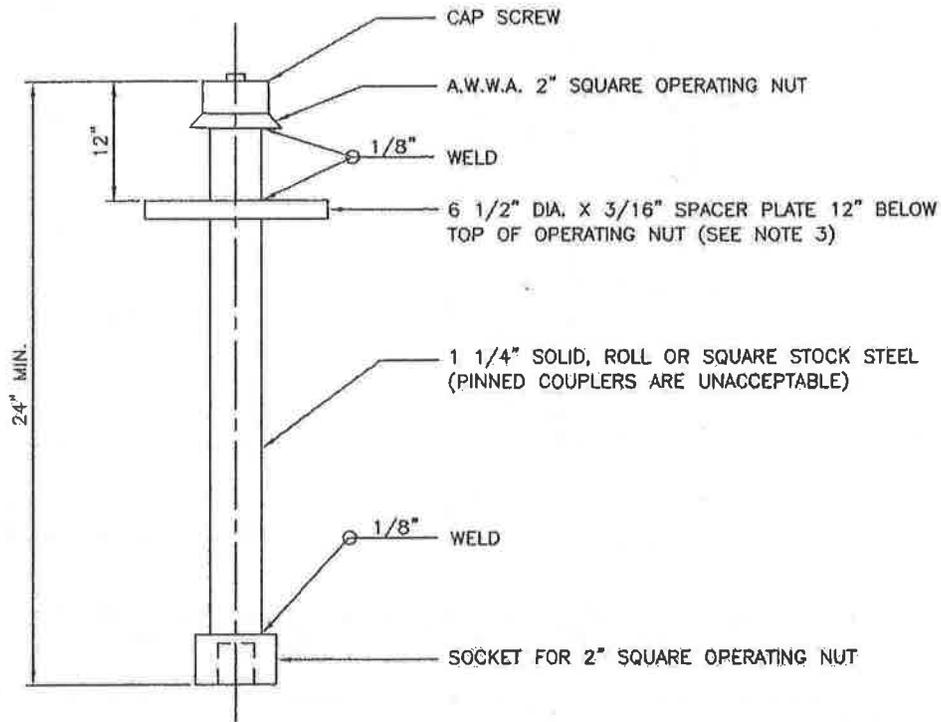
REVISION	DRAWN	APP'D.	DATE
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APPROVED			
DISTRICT ENGINEER	RCE	DATE	

WEST BASIN MUNICIPAL WATER DISTRICT

VALVE, VALVE BOX, AND COVER

STANDARD DRAWING
RW7

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SPACER PLATE
PLAN

NOTES:

1. PROVIDE VALVE STEM EXTENSION WHEN DEPTH TO OPERATING NUT EXCEEDS 48" (FABRICATE EXTENSION TO FIELD MEASUREMENT - SEE NOTE 2).
2. NO VALVE STEM EXTENSION SHALL BE LESS THAN 2 FEET IN LENGTH. TERMINATE EXTENSION 24" TO 36" FROM FINISHED GRADE.
3. PROVIDE ADDITIONAL SPACER PLATE WHEN DISTANCE TO BOTTOM SOCKET EXCEEDS 5 FEET.
4. HOT DIP GALVANIZE EXTENSION AFTER FABRICATION.

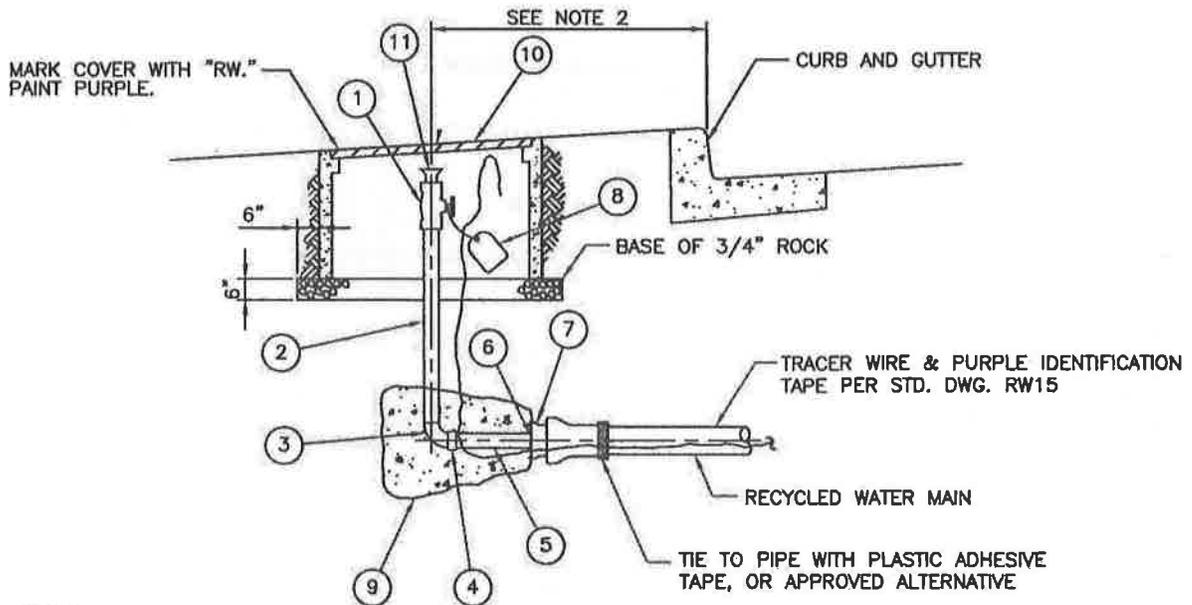
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APPROVED			
DISTRICT ENGINEER		RCE	DATE

WEST BASIN MUNICIPAL WATER DISTRICT

VALVE STEM EXTENSION

STANDARD
DETAIL
RW8

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NOTE:

1. WHEN BLOW OFF VALVE IS PLACED BEHIND CURB USE BROOKS 66T OR EISEL 6T METER BOX WITH STEEL LID OR APPROVED EQUAL. WHEN BLOW OFF VALVE IS PLACED IN STREET USE 24" PRECAST CONCRETE MANHOLE WITH ALHAMBRA A-1254B COVER OR APPROVED EQUAL.
2. EXACT LOCATION OF BLOWOFF TO BE AS PROVIDED ON CONSTRUCTION PLANS AND AS APPROVED BY THE DISTRICT.

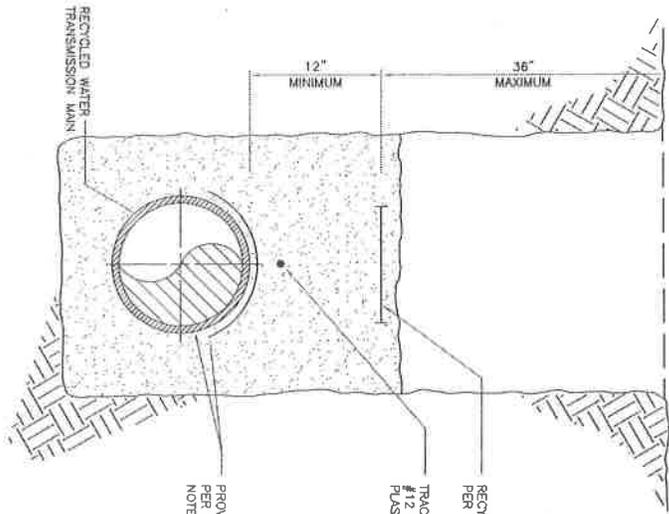
CONSTRUCTION ITEMS / MATERIALS LIST			
ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	2" BRONZE BALL VALVE	MUELLER FORD	B-25174 B-21-777
②	2" COPPER TUBING	---	TYPE "K" SOFT
③	2" COPPER 90° ELBOW S.J. x S.J. (LONG RADIUS)	---	---
④	2" BRONZE COUPLING - COPPER TO IP THREAD	---	---
⑤	2" BRASS NIPPLE, IP, THREAD x IP THREAD	---	---
⑥	RIGID PVC REDUCING BUSHING (2-1/2" x 2")	---	---
⑦	DUCTILE IRON PLUG, PIPE SIZE x 2-1/2" IP. THREAD TAP	---	---
⑧	WARNING TAG PER STANDARD DRAWING RW16	---	---
⑨	THRUST BLOCK, PER STANDARD DRAWING RW19	---	---
⑩	PRECAST CONCRETE VAULT WITH COVER (SEE NOTE 1)	---	---
⑪	2" COPPER/PVC THREADED PLUG	---	---

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WEST BASIN MUNICIPAL WATER DISTRICT

DEAD END WITH TEMPORARY
2-INCH BLOW OFF

STANDARD
DRAWING
RW12



RECYCLED WATER TRANSMISSION MAIN

12" MINIMUM

36" MAXIMUM

RECYCLED WATER PIPE WARNING TAPE PER STANDARD DRAWING RW15

TRACER WIRE FOR NON-METALLIC PIPE #12 CU. HAMPE. SECURE TO PIPE WITH PLASTIC ADHESIVE TAPE EVERY 10 FEET.

PROVIDE RECYCLED WATER PIPE IDENTIFICATION PER THE STANDARD SPECIFICATIONS AND NOTES HEREON

NOTES:
 ALL RECYCLED WATER PRELINES, INCLUDING SERVICE LINES AND ATTACHED APPURTENANCES SHALL BE PROVIDED WITH IDENTIFICATION PER ONE OF THE FOLLOWING ALTERNATIVES:
 PVC PIPE ALTERNATIVE:

1. PIPE SHALL BE COLORED PURPLE AND INTEGRALLY STAMPED/MARKED WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" PRINTED IN 5/8" BLACK LETTERING ON OPPOSITE SIDES OF THE PIPE.
 2. AS AN OPTION TO PURPLE PIPE, PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW15.
 3. AS AN OPTION TO EITHER OF THE ABOVE ALTERNATIVES, PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE USED TO ENCASE THE PIPE PER STANDARD DRAWING RW15.
- DUCTILE IRON PIPE ALTERNATIVE:

1. PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" SHALL BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW15.
 2. AS AN OPTION TO THE ABOVE ALTERNATIVE, PURPLE COLORED POLYETHYLENE WRAP WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE USED TO ENCASE THE PIPE PER STANDARD DRAWING RW15. PURPLE POLYETHYLENE ENCASEMENT SHALL BE USED AS THE SECOND LAYER OF ENCASEMENT REQUIRED FOR DUCTILE IRON PIPE CONSTRUCTION PER THE STANDARD SPECIFICATIONS.
- STEEL PIPE ALTERNATIVE:
1. PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" SHALL BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW15.

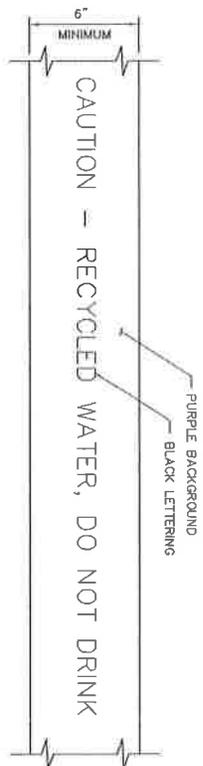
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WEST BASIN MUNICIPAL WATER DISTRICT

RECYCLED WATER PIPE IDENTIFICATION

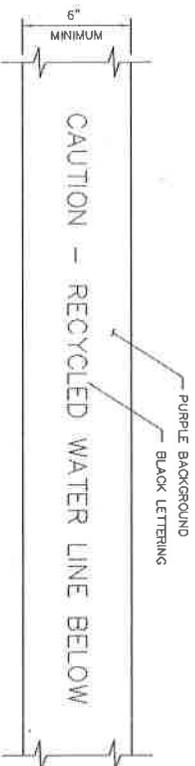
STANDARD DRAWING RW15



FOR ATTACHMENT TO PIPE

RECYCLED WATER PIPE IDENTIFICATION TAPE

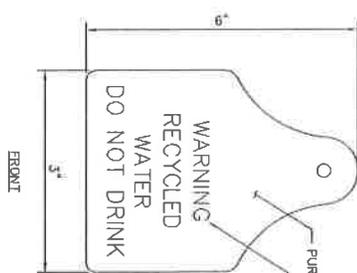
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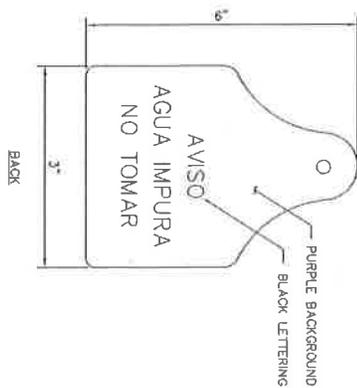
FOR BURIAL 12" MINIMUM ABOVE PIPE

RECYCLED WATER PIPE WARNING TAPE

N.T.S.



FRONT



BACK

RECYCLED WATER WARNING TAGS

N.T.S.

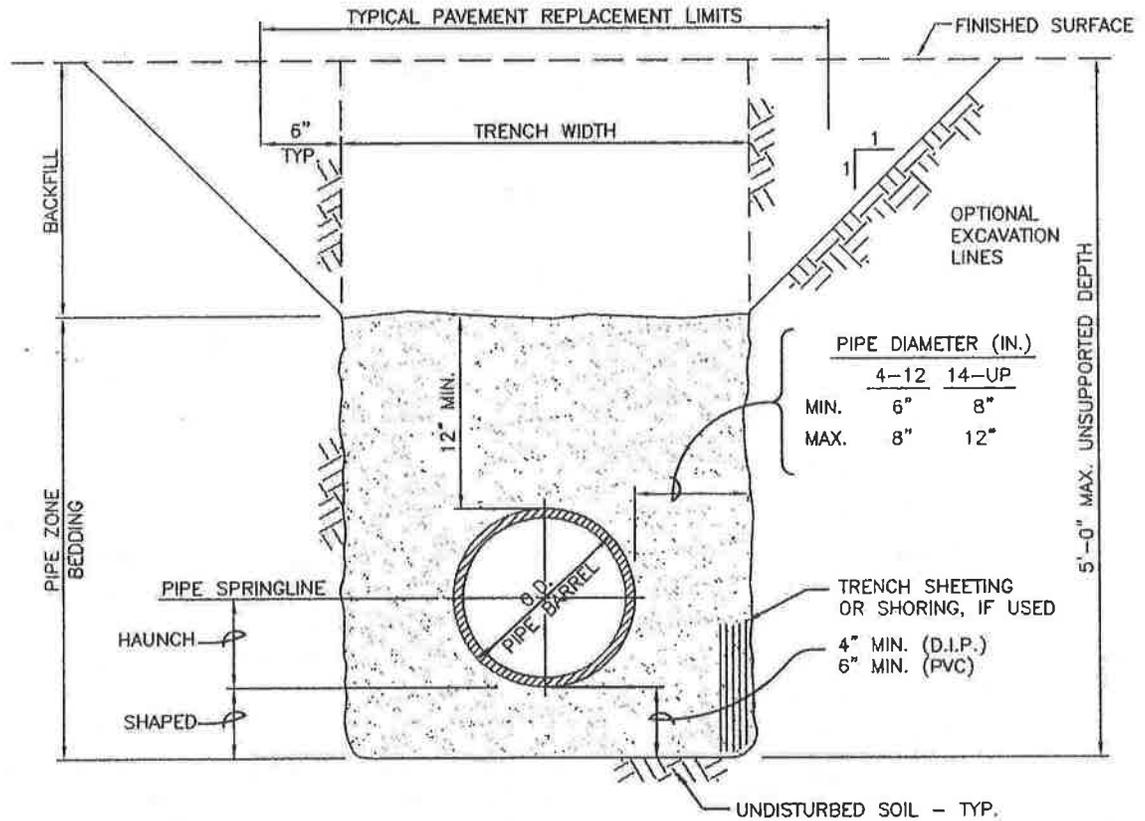
NOTES:

1. RECYCLED WATER WARNING TAGS SHALL CONSIST OF WEATHERPROOF PLASTIC, 3-INCH BY 4-INCH, WITH PURPLE BACKGROUND AND BLACK LETTERING. WARNING TAGS SHALL BE ATTACHED TO EACH RECYCLED WATER DEVICE WITH A NYLON TIE WRAP.
2. RECYCLED WATER IDENTIFICATION TAPE SHALL CONSIST OF A MINIMUM 4 MIL POLYETHYLENE WITH METALLIC FINISHING, WITH PURPLE BACKGROUND AND BLACK LETTERING. TAPE WIDTH SHALL BE 6-INCHES FOR PIPE 6-INCH AND SMALLER AND 12-INCHES FOR PIPE 8-INCH AND LARGER. LETTERING SHALL BE 2-INCHES HIGH AND THE MESSAGE SHALL REPEAT EVERY 36-INCHES. IDENTIFICATION TAPE SHALL BE FASTENED TO THE PIPE WITH PLASTIC ADHESIVE TAPE BANNED AROUND THE PIPE AT NO MORE THAN 5-FOOT INTERVALS, OR AS APPROVED THE DISTRICT.
3. PURPLE COLORED POLYETHYLENE ENCASUREMENT WITH A MINIMUM THICKNESS OF 8 MILS MAY BE SUBSTITUTED FOR IDENTIFICATION TAPE SPECIFIED IN NOTE 2 ABOVE. MESSAGE SHALL CONTAIN 1-INCH HIGH LETTERING REPEATING EVERY 24-INCHES.
4. RECYCLED WATER WARNING TAPE MEETING THE SAME SPECIFICATIONS AS NOTE 2 ABOVE SHALL BE BURIED ABOVE THE PIPE ZONE BEDDING A MINIMUM OF 12-INCHES ABOVE THE PIPE.
5. WARNING TAGS, IDENTIFICATION/WARNING TAPE AND POLYETHYLENE ENCASUREMENT SHALL BE AS MANUFACTURED BY T. CHRISTY ENTERPRISES, TERESA TAPE (DIVISION OF REEF INDUSTRIES) OR APPROVED EQUAL.
6. RECYCLED WATER PIPELINES LOCATED IN NON-PAVED AREAS OUTSIDE STREET RIGHT-OF-WAY SHALL ALSO BE IDENTIFIED WITH MARKER POSTS PER STD. DWG. RW261.
7. PURPLE COLOR SHALL BE PANTONE 512.

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STANDARD DRAWING RW16

REPLACE PAVED SURFACE AND BASE PER RW18 OR JURISDICTIONAL REQUIREMENTS AND PERMITS (WHICHEVER IS MORE STRINGENT).



NOTE:

1. SHOULD LARGE GRAVEL OR COBBLES BE ENCOUNTERED AT THE TRENCH BOTTOM, THEY SHALL BE REMOVED AND REPLACED WITH GRANULAR MATERIAL WHICH SHALL BE COMPACTED TO PROVIDE UNIFORM SUPPORT AND A FIRM FOUNDATION.
2. IF EXCESSIVELY WET, SOFT, SPONGY, UNSTABLE, OR SIMILARLY UNSUITABLE MATERIAL IS ENCOUNTERED AT THE TRENCH BOTTOM, IT SHALL BE REMOVED AND REPLACED BY CRUSHED ROCK OR GRAVEL OF SUFFICIENT THICKNESS TO FORM A FIRM FOUNDATION.
3. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEETING IS REQUIRED FOR ALL VERTICAL TRENCH WALLS.
4. TRENCH SHEETING OR SHORING SHALL BE A MINIMUM OF 6 INCHES FROM THE PIPE BARREL AT SPRINGLINE.
5. VERTICAL TRENCH WALLS
 - a) FOR DEPTHS UP TO 5'-0", NO TRENCH SUPPORT IS REQUIRED UNLESS UNSTABLE OR RUNNING SOIL IS ENCOUNTERED.
 - b) FOR DEPTHS EXCEEDING 5'-0", SHEETING, SHORING OR OTHER EQUIVALENT BRACING SHALL BE PROVIDED IN ACCORDANCE WITH THE CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CAL/OSHA) CODE OF REGULATIONS TITLE 8, SUB CHAPTER 4 "CONSTRUCTION SAFETY ORDERS".
6. OPTIONAL COMBINATION OF VERTICAL AND SLOPING TRENCH WALLS
 - a) TRENCH DEPTHS EXCEEDING 5'-0" SHALL HAVE VERTICAL WALLS IN PIPE ZONE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
 - b) FOR TRENCHES WITH COMBINED WALLS AND ANY DEPTH EXCEEDING 3'-6", THE CONTRACTOR SHALL PROTECT IN ACCORDANCE WITH THE CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CAL/OSHA) CODE OF REGULATIONS TITLE 8, SUB CHAPTER 4 "CONSTRUCTION SAFETY ORDERS".
7. BEDDING SHALL BE PER STANDARD SPECIFICATIONS, EXCEPT THAT
 - a) ALL PIPE SHALL HAVE A BEDDING WITH AN SE OF 30 MINIMUM.
 - b) SE OF 30 AND HAUNCH BEDDING SHALL BE HAND TAMPED TO 90% RELATIVE COMPACTION MIN. FOR PVC AND ALL OTHER FLEXIBLE PIPE INSTALLATIONS, WHEREUPON BEDDING ABOVE SPRINGLINE SHALL BE COMPACTED CONCURRENTLY WITH THE BACKFILL.

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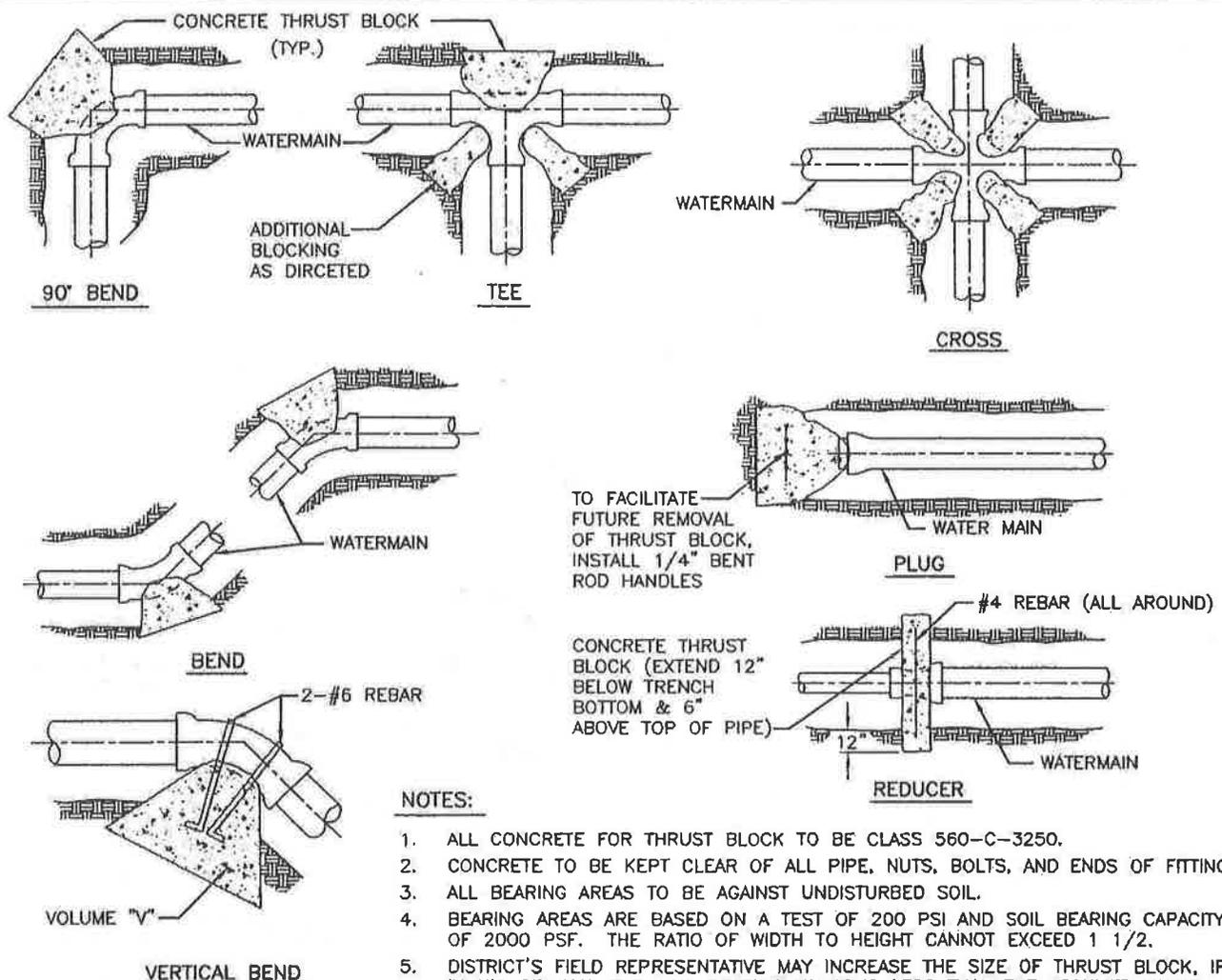
WEST BASIN MUNICIPAL WATER DISTRICT

PIPE TRENCHING AND BEDDING

STANDARD DRAWING

RW17

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NOTES:

1. ALL CONCRETE FOR THRUST BLOCK TO BE CLASS 560-C-3250.
2. CONCRETE TO BE KEPT CLEAR OF ALL PIPE, NUTS, BOLTS, AND ENDS OF FITTINGS.
3. ALL BEARING AREAS TO BE AGAINST UNDISTURBED SOIL.
4. BEARING AREAS ARE BASED ON A TEST OF 200 PSI AND SOIL BEARING CAPACITY OF 2000 PSF. THE RATIO OF WIDTH TO HEIGHT CANNOT EXCEED 1 1/2.
5. DISTRICT'S FIELD REPRESENTATIVE MAY INCREASE THE SIZE OF THRUST BLOCK, IF IN HIS OPINION, THE SOIL BEARING VALUE IS LESS THAN THE ASSUMED VALUE.
6. TIE BARS NOT EMBEDDED IN CONCRETE SHALL BE CLEANED AND COATED WITH BITUMASTIC NO. 50 OR EQUIVALENT.
7. THRUST BLOCK ON CROSSES SHALL ONLY BE USED WHEN THERE IS A STUB-OUT ON ONE OR MORE SIDES.
8. PROVIDE POLYETHYLENE (8 MIL MIN) BETWEEN FITTING AND CONCRETE.

PIPE SIZE	HORIZONTAL/VERTICAL ANCHOR AND THRUST BLOCK								
	90°		45°		22 1/2°		11 1/4°		TEE/PLUG
	"A"	"V"	"A"	"V"	"A"	"V"	"A"	"V"	"A"
3 3/4"	3	1.4	2	1.0	2	.5	1	.3	2
6"	6	2.9	3	2.0	2	1.1	1	.6	4
8"	10	5	5	3.5	3	1.9	1.5	1.0	7
10"	16	7.5	8	5.3	5	2.9	2.5	1.5	12
12"	21	10.6	12	7.5	6	4.0	3	2.1	16
14"	30	14.2	16	10	8	5.4	4	2.8	21
16"	38	18.3	21	13	10	7	5	3.6	27

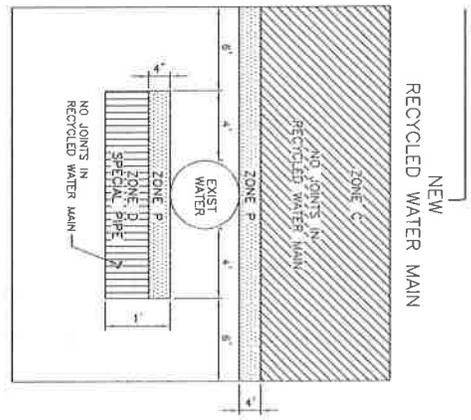
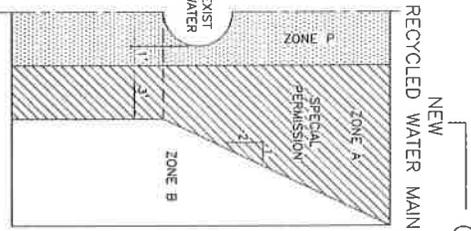
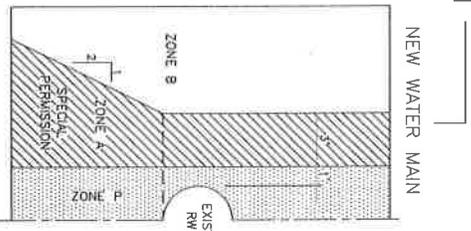
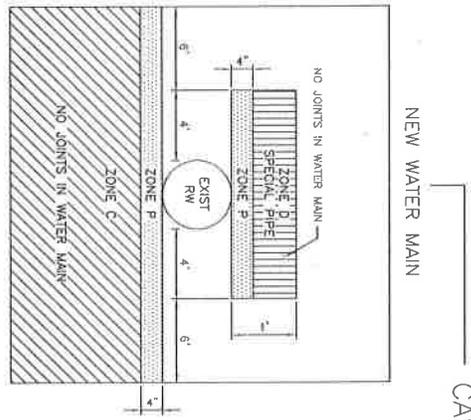
"A" DESIGNATES AREA IN SQ. FT. OF HORIZONTAL THRUST BLOCK.
 "V" DESIGNATES VOLUME IN C.Y. OF VERTICAL ANCHOR BLOCK.

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WEST BASIN MUNICIPAL WATER DISTRICT

TYPICAL THRUST BLOCKS

**STANDARD DRAWING
RW19**



CROSSINGS

PARALLEL CONSTRUCTION

CROSSINGS

CONSTRUCTION REQUIREMENTS FOR DOMESTIC WATER MAINS

CONSTRUCTION REQUIREMENTS FOR RECYCLED WATER MAINS

- ZONE**
- A - SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL WATER MAIN IN THIS AREA WITHOUT DISTRICT AND STATE HEALTH DEPARTMENT APPROVAL.
 - B - NOT APPLICABLE
 - C - IF THE SEWER OR RECYCLED WATER MAIN DOES NOT MEET THE REQUIREMENTS OF CASE I, ZONE C THE WATER MAIN SHALL BE CONSTRUCTED AS DESCRIBED FOR ZONE B ABOVE, WITH THE EXCEPTION THAT THE WATER MAIN SHALL CONTAIN NO JOINTS IN ZONE C.
 - D - IF THE SEWER OR RECYCLED WATER MAIN DOES NOT MEET THE REQUIREMENTS OF CASE I, ZONE D THE WATER MAIN SHALL ALSO BE CONSTRUCTED AS DESCRIBED FOR ZONE B ABOVE, WITH THE EXCEPTION THAT THE WATER MAIN SHALL CONTAIN NO JOINTS IN ZONE D.
 - P - PROHIBITED ZONE: NO DOMESTIC WATER MAINS SECTION 64630 (4) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

- ZONE**
- A - SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL SEWER OR RECYCLED WATER MAIN IN THIS AREA WITHOUT DISTRICT ENGINEER AND STATE HEALTH DEPARTMENT APPROVAL.
 - B - NOT APPLICABLE
 - C - DIP POLYETHYLENE LINED WITH MECHANICAL JOINTS, A CONTINUOUS SECTION OF 3000 PVC PIPE CLASS 200 CENTERED OVER THE PIPE BEING CROSSED, OR ANY SEWER PIPE IN A 1/4" THICK CONTINUOUS STEEL CASING WITH ANNUAL SPACE PRESSURE RATED FOR SEWER LINES FOR RECYCLED WATER MAINS USE ANY OF THE REQUIREMENTS DESCRIBED FOR CASE I, ZONE C.
 - D - A CONTINUOUS SECTION OF DIP POLYETHYLENE LINED WITH PUSH-ON TYPE RUBBER RING JOINTS, A CONTINUOUS SECTION OF 3000 PVC PIPE CLASS 200 CENTERED ON THE PIPE BEING CROSSED, ANY SEWER PIPE IN A 1/4" THICK CONTINUOUS STEEL CASING WITH ANNUAL SPACE PRESSURE RATED FOR SEWER LINES FOR RECYCLED WATER MAINS USE ANY OF THE REQUIREMENTS DESCRIBED FOR CASE I, ZONE D.
 - P - PROHIBITED ZONE: NO SEWERS OR RECYCLED WATER MAINS: SECTION 64630 (4) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

NOTES:

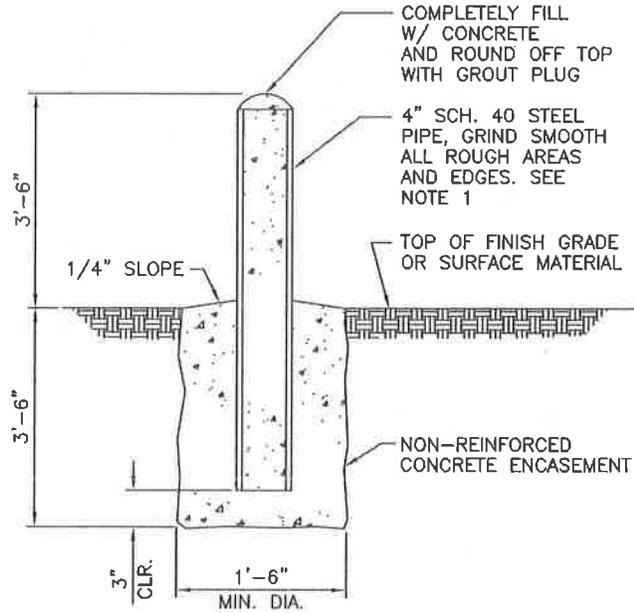
1. THE DESIGN AND INSTALLATION OF SEWER FORCE MAINS REQUIRE SPECIAL DISTRICT REVIEW AND APPROVAL.
 2. THE DESIGN AND INSTALLATION OF SEWER FORCE MAINS SHALL BE REVIEWED AND APPROVED BY THE STATE HEALTH DEPARTMENT PRIOR TO CONSTRUCTION.
- REF. SOURCE: "GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PRELINES", STATE OF CALIFORNIA, DEPARTMENT OF HEALTH SERVICES, DATED APRIL 14, 2003.

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WEST BASIN MUNICIPAL WATER DISTRICT
CRITERIA FOR THE SEPARATION
OF WATER MAINS FROM
RECYCLED WATER MAINS

STANDARD
DRAWING
RW21

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NOTES:

1. PAINT WITH TWO COATS SCHOOL BUS YELLOW WITH SPECIFIED COATING AND STENCIL WITH 2" HIGH BLACK LETTERS THE STATION OF THE PIPELINE STRUCTURE.

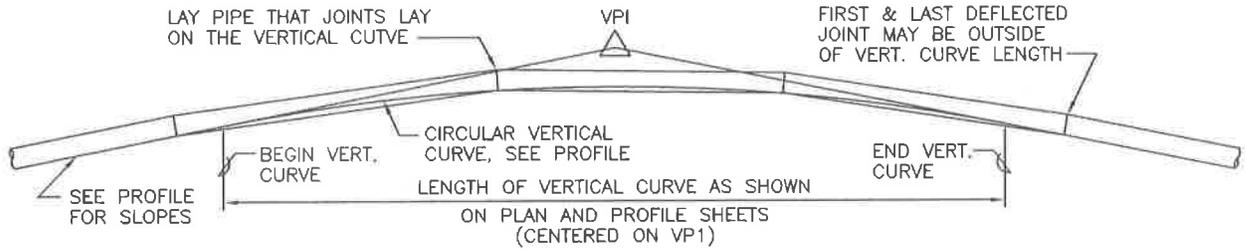
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DISTRICT ENGINEER		RCE	DATE

WEST BASIN MUNICIPAL WATER DISTRICT

GUARD POST

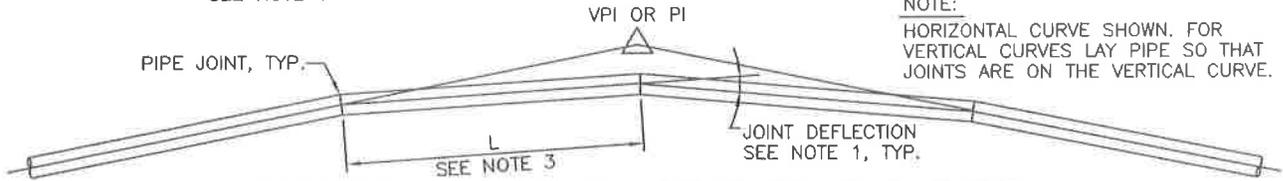
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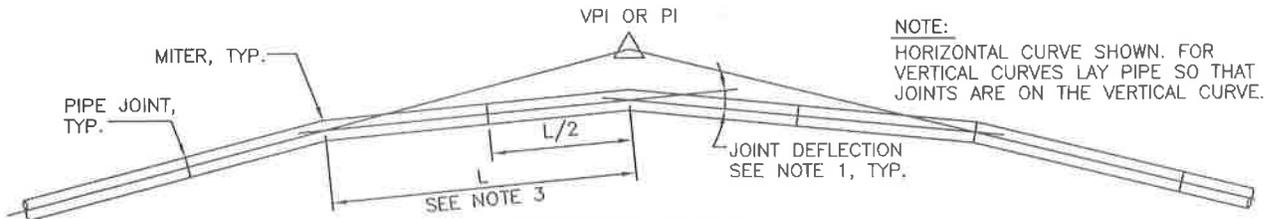


TYPICAL VERTICAL CURVE (VC) UP OR DOWN

SEE NOTE 1



DEFLECTED JOINT OR BEVELED END TYPE



MITERED TYPE

NOTES:

1. WHERE CURVES CANNOT BE INSTALLED BY JOINT DEFLECTIONS OF STANDARD PIPE LENGTH, THE CONTRACTOR MAY SELECT FROM THE FOLLOWING OPTIONS:
 - a) USE SHORTER PIPE LENGTHS (SEE NOTE 3) AND THE ALLOWABLE JOINT DEFLECTION (SEE NOTES 4a & 4b).
 - b) USE SPECIAL BEVELED ENDS OR MITERED PIPE LENGTHS (SEE NOTE 4c).
2. DEFLECTION OF VERTICAL CURVES:

CURVE DOWN

CURVE UP
3. THE DISTANCE BETWEEN JOINTS OR MITERS SHALL BE:
 - a) FOR VERTICAL CURVES UP - 10 FT. MIN. & 10 FT. MAX.
 - b) FOR VERTICAL CURVES DOWN FROM DEFLECTED POINTS - 10 FT. MIN. & 40 FT. MAX.
 - c) FOR VERTICAL CURVES DOWN FROM BEVELED END OR SINGLE MITERED PIPE SECTION - 30 FT. MIN. & 40 FT. MAX.
 - d) FOR HORIZONTAL CURVES - 10 FT. MIN. & 40 FT. MAX.
4. THE MAXIMUM ALLOWABLE JOINT DEFLECTIONS FOR CURVES SHALL BE:
 - a) FOR WSP CURVES FROM DEFLECTED JOINTS. THE JOINT DEFLECTIONS SHALL BE NO MORE THAN 75 PERCENT OF THE MAXIMUM ALLOWABLE AS RECOMMENDED BY THE PIPE MANUFACTURER.
 - b) FOR DIP CURVES FROM DEFLECTED JOINT. THE MAXIMUM DEFLECTED ANGLE SHALL BE 5.0 DEGREES OR 75 PERCENT OF THE MANUFACTURER'S RECOMMENDED JOINT DEFLECTION, WHICHEVER IS LESS.
 - c) FOR CURVES FROM BEVELED JOINTS OR SINGLE MITERED PIPE SECTIONS, THE PIPE BEVELS OR MITERS SHALL BE MORE THAN 5.0 DEGREES.
5. ALL ELEMENTAL ANGLES AND LENGTHS SHALL BE EQUAL IN A BEND.
6. CURVES DO NOT REQUIRE SPECIAL BEDDING OR BACKFILL. USE STANDARD TRENCH BACKFILL AS SPECIFIED.
7. FOR COMBINATION VERTICAL AND HORIZONTAL CURVES THE REQUIREMENTS FOR BOTH CONDITIONS SHALL BE COMBINED.

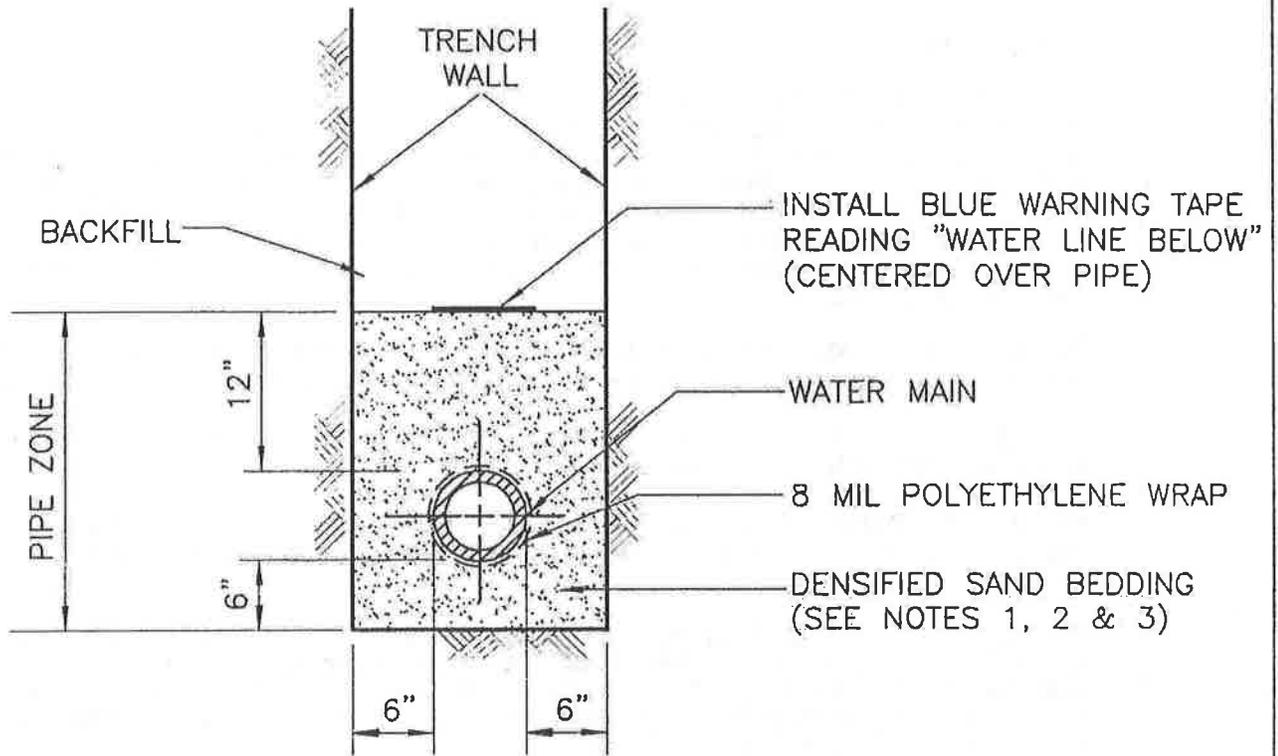
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WEST BASIN MUNICIPAL WATER DISTRICT

PIPELINE CURVES

STANDARD
DRAWING
RW42

APPENDIX C
CITY OF TORRANCE
STANDARD DRAWINGS



NOTES:

1. SAND BEDDING SHALL CONFORM TO SECTIONS 200-1.5.3 AND 200-1.5.5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
2. DENSIFICATION OF BEDDING SHALL BE ACCOMPLISHED IN CONFORMANCE WITH 306-1.2.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
3. BEDDING SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY UNDER STRUCTURES AND 90% ELSEWHERE.

ACCOMPANYING STD.'S T700 AND T116

CITY OF TORRANCE

JY/EM/T701--1

DATE ISSUED

JAN 2011

BEDDING FOR WATER PIPE

ROBERT J. BESTE
PUBLIC WORKS DIRECTOR
P.C.E. NO. 50737

RTA/BA

STANDARD NO.

T 701

SHEET 1 OF 1

5B. THE NEW FINISH COURSE SHALL BE PLACED FLUSH WITH THE EXISTING ADJACENT PAVING SURFACE - MAXIMUM VARIANCE FROM FLUSH IS 1/8". NEW AC PAVEMENT ADJACENT TO EXISTING EDGE OF PCC GUTTER SHALL BE 3/8" HIGHER THAN EDGE OF GUTTER.

6B. FOR PCC ROADWAY PAVEMENT, DOWEL AT 24" O.C., #4 DEFORMED BAR, 6" EMBEDMENT, AND CENTERED IN EXISTING SLAB WITH 1-1/2" MINIMUM CONCRETE COVER. DOWEL SHALL BE EPOXIED IN EXISTING SLAB AND CAST IN NEW SLAB.

METHODOLOGY:

1C. AT THE END OF EACH WORK DAY, ANY TRENCH IN AN ARTERIAL OR IN ROLLING HILLS ROAD, MAPLE/235TH ST. OR ARLINGTON AVE. SHALL BE COVERED BY NON-SKID STEEL PLATES OR BE PAVED WITH TEMPORARY OR PERMANENT PAVEMENT FLUSH WITH ADJACENT PAVEMENT SURFACES. WHEN NON-SKID STEEL PLATES ARE USED, THEY SHALL BE WELDED, SECURED IN PLACE, RAMPED WITH AC, AND NOT USED FOR MORE THAN 48 CONSECUTIVE HOURS ON THE SAME SEGMENT OF TRENCH. "PLATE AHEAD" SIGN SHALL BE PROPERLY INSTALLED WHEN PLATES ARE IN USE. OTHER CITY STREETS MAY HAVE LESSER REQUIREMENTS AND WILL BE CONSIDERED ON A CASE BY CASE BASIS.

2C. ALL TRAFFIC LANES SHALL BE CLEANED AND RESTORED FOR USE IMMEDIATELY UPON PLACEMENT OF TEMPORARY AC PAVEMENT, TRENCH PLATES AND/OR FINAL AC PAVEMENT.

3C. ALL TRAFFIC STRIPING AND/OR MARKINGS REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AS DIRECTED BY THE ENGINEER.

4C. TRAFFIC CONTROL SHALL BE PER CITY OF TORRANCE "CONSTRUCTION TRAFFIC CONTROL PROCEDURES ON CITY STREETS" AVAILABLE FROM THE ENGINEERING DEPARTMENT PERMIT COUNTER.

5C. MORATORIUM FOR CUTTING NEW OR RECONSTRUCTED STREETS IS 5 YEARS WITHOUT SPECIAL APPROVAL FROM THE ENGINEERING DIRECTOR. NEW UTILITY SERVICE CONNECTIONS AND SERVICE LINE REPAIRS ARE EXCEPTED IF NOT ABLE TO BE FORSEEN AT THE TIME THE ROADWAY WAS RECONSTRUCTED. APPROVED LONGITUDINAL EXCAVATIONS IN NEW STREETS SHALL REQUIRE THE FULL LANE TO BE GROUND AND OVERLAID.

6C. SLURRY SEALING OF TRENCH AREA MAY BE OMITTED IF PROJECT IS COORDINATED WITHIN ONE YEAR OF A CITY STREET REHABILITATION OR SLURRY SEAL PROJECT.

7C. A COLLECTION DEVICE SHALL BE USED TO COLLECT SEDIMENTS GENERATED DURING SAWCUTTING OPERATION.

8C. TRENCHES WITH "W" LESS THAN 8" WIDE AND LESS THAN OR EQUAL TO 24" DEEP ARE NOT REQUIRED TO USE T-SECTION PAVEMENT CONSTRUCTION, OR APPLY SLURRY SEAL.

9C. ALL PAVEMENT REMOVALS SHALL USE STRAIGHT LINE SAW CUTS A MINIMUM OF 1.5" DEEP.

10C. BORING SHALL BE CONSIDERED AS A CONTINUOUS TRENCH AS FAR AS EXCAVATION REPAIR. POTHoles LOCATED INTERMITTENTLY WILL NOT BE TREATED AS SEPARATE EXCAVATIONS BUT AS A CONTINUOUS EXCAVATION. THE CITY SHALL RESERVE THE RIGHT TO REQUIRE BORING OR OPEN TRENCH AS THE SITUATION MAY ARISE.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED
27 SEP 2002

TRENCH BACKFILL & PAVEMENT REPAIRS

STANDARD NO.

T116-2

RICHARD W. BURTT
ENGINEERING DIRECTOR
R.C.E. NO. 32862
R.T.E. NO. 1538



SHEET 4 OF 4

TT\116-2

NOTES:

BELOW GROUND:

1A. SEE STD. PLAN NO'S T204, T302, AND T701 FOR BEDDING REQUIREMENTS.

2A. FOR TRENCHES WITH "W" GREATER THAN 2' OR IF TRENCH WALLS ARE SLOPED, BACKFILL SHALL BE CRUSHED AGGREGATE BASE, OR NATIVE OR OTHER EXCAVATION MATERIAL WITH AN SE VALUE OF 30 OR GREATER. BACKFILL MATERIAL SHALL BE DENSIFIED TO A RELATIVE COMPACTION OF 95% IN THE UPPER 3 FEET AND TO 90% BELOW THE UPPER 3 FEET. FOR TRENCHES LONGER THAN 200' OR LARGER THAN 1,000 SQUARE FEET A LICENSED SOILS ENGINEER SHALL BE PRESENT TO MONITOR THE NATIVE OR IMPORTED BACKFILL OPERATION AND TEST FOR COMPACTION AT 100' OR 200 SQUARE FOOT MAXIMUM INTERVALS

FOR TRENCHES WITH "W" LESS THAN OR EQUAL TO 2' IN THE ROADWAY, A SAND-CEMENT SLURRY (100-E-100) BACKFILL SHALL BE USED. SLURRY SHALL CURE 16 HOURS MINIMUM PRIOR TO BASE PLACEMENT. RAPID SET CEMENT SLURRY SHALL CURE 1 HOUR MINIMUM PRIOR TO BASE PLACEMENT.

IN AREAS NOT IN EXISTING ROADWAY, BACKFILL SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 90%.

3A. NEW CRUSHED AGGREGATE BASE SHALL BE 2" THICKER THAN EXISTING BASE, BUT NOT LESS THAN 8" THICK.

4A. EXCAVATED MATERIAL NOT APPROVED FOR USE IN TRENCH BACKFILL SHALL BE REMOVED FROM JOB SITE UNLESS OTHERWISE USED IN THE WORK.

5A. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEATHING IS REQUIRED FOR ALL VERTICAL TRENCH WALLS.

6A. ANY SHORING REQUIRED SHALL BE DESIGNED BY A REGISTERED CIVIL OR STRUCTURAL ENGINEER.

7A. "W" SHALL BE MEASURED AT TOP OF BEDDING.

VISIBLE SURFACE:

1B. IF REMAINING AC PAVEMENT BETWEEN EDGE OF TRENCH AND EXISTING GUTTER, CURB, CROSS GUTTER, OR CUT LINE IS LESS THAN 3 FEET IN WIDTH, THEN THIS AC SHALL BE REMOVED AND REPLACED WITH NEW AC PAVEMENT.

2B. THE ENGINEER MAY REQUIRE WIDER REMOVAL AREA THAN THAT SHOWN ABOVE TO SUIT FIELD CONDITIONS.

3B. CRACKS SHALL BE SEALED AND A TYPE 2 SLURRY SEAL COATING WITH 2% LATEX SHALL BE APPLIED FROM LANE LINE TO LANE LINE FOR LONGITUDINAL TRENCHES GREATER THAN 200' IN LENGTH FOR ANY LANE AFFECTED.

4B. THE THICKNESS OF REPLACEMENT ASPHALT SHALL BE A MINIMUM OF 1" GREATER THAN EXISTING AC (2" GREATER IF EXISTING STREET IS PAVED WITH RUBBERIZED AC) BUT NOT LESS THAN 4" (5" FOR RUBBERIZED AC). IF EXISTING PAVEMENT IS PCC, REPLACEMENT CONCRETE SHALL BE AS PER SECTION 201.1 OF THE STANDARD SPECS AND 1" THICKER THAN EXISTING.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED

10 SEP 2002

TRENCH BACKFILL & PAVEMENT REPAIRS

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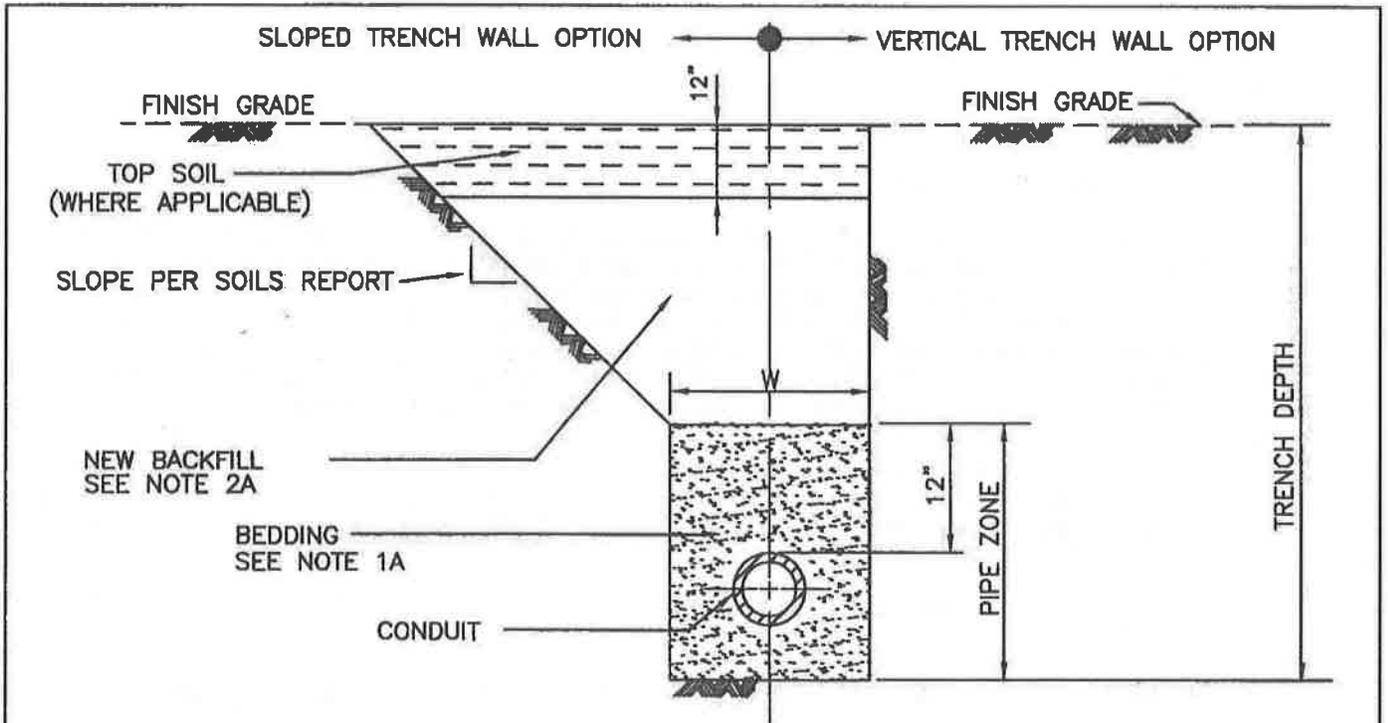


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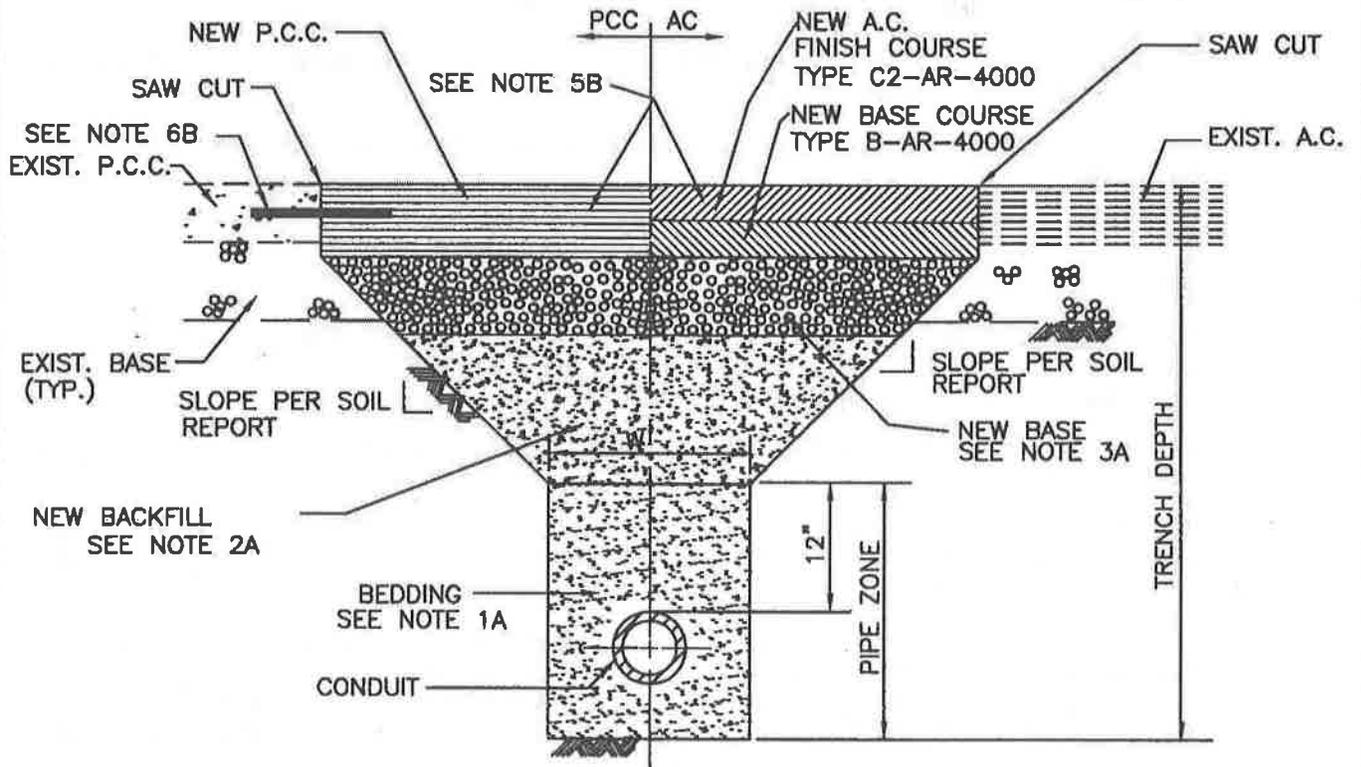
T116-2

SHEET 3 OF 4

TT\T116-2



TYPICAL TRENCH SECTION OUTSIDE ROADWAY



**TYPICAL TRENCH SECTION WITHIN ROADWAY
SLOPED TRENCH WALL OPTION**

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TT116-2

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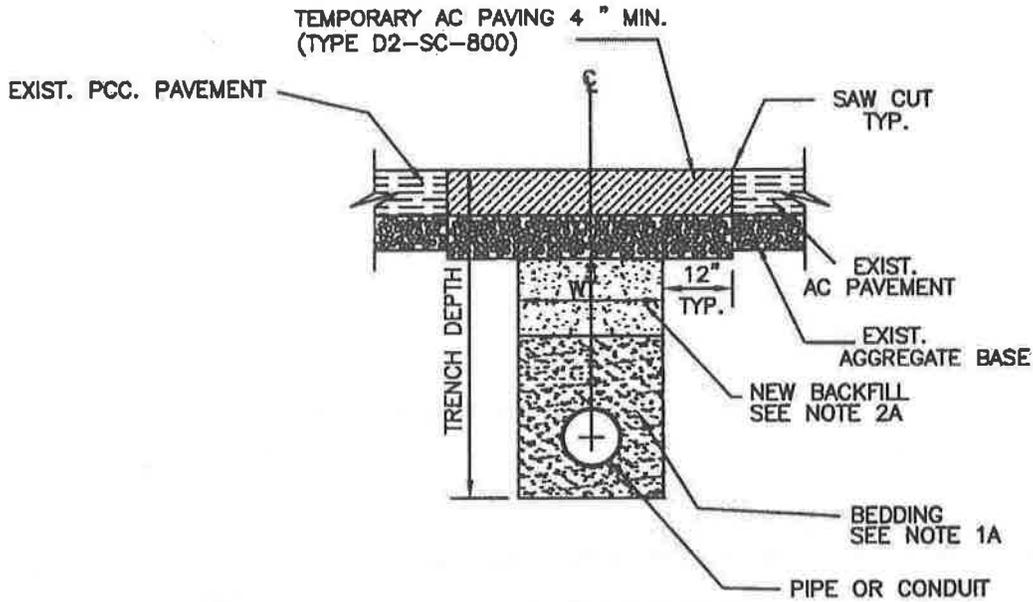
TRENCH BACKFILL & PAVEMENT REPAIRS

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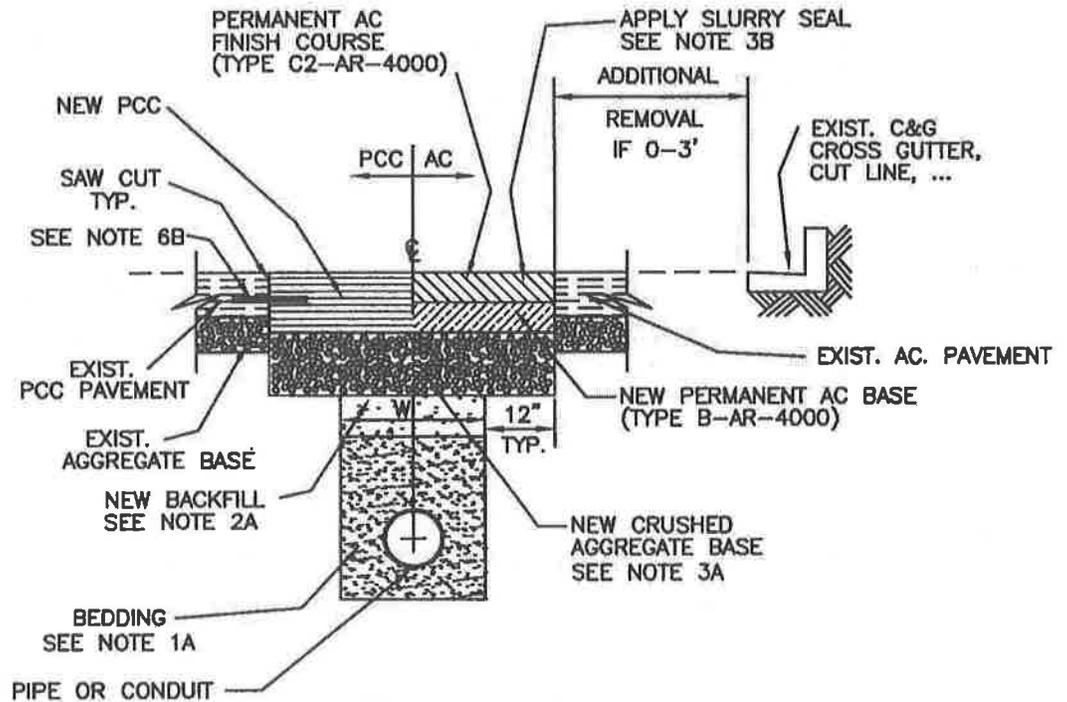
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SHEET 2 OF 4



TEMPORARY ASPHALT REPAIR



PERMANENT TRENCH REPAIR

**TYPICAL TRENCH SECTION WITHIN ROADWAY
(SEE NOTE 8C FOR EXCEPTION)**

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10 SEP 2002

TRENCH BACKFILL & PAVEMENT REPAIRS

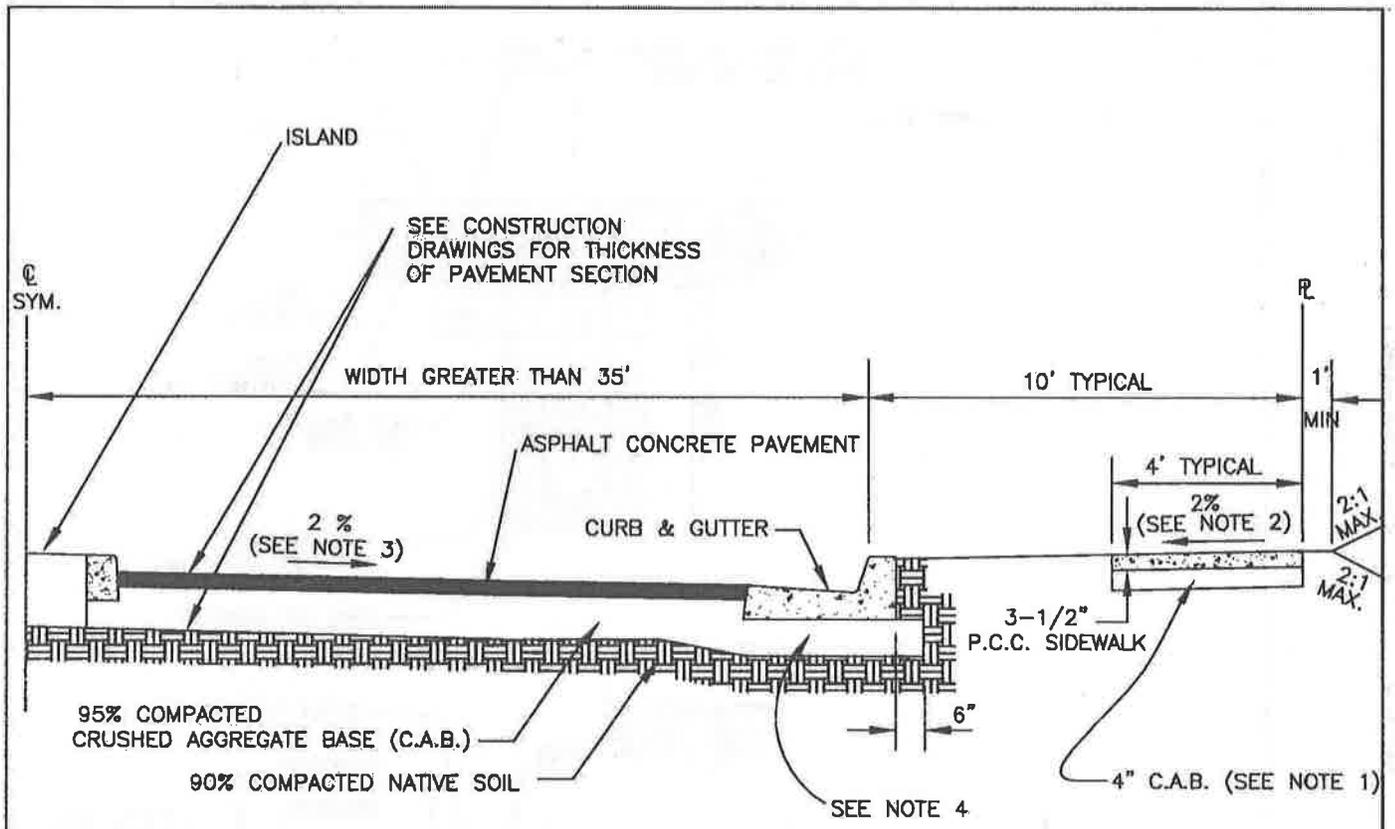
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R.T.E. NO. 1538

STANDARD NO.

T116-2

SHEET 1 OF 4

TT116-2



MINOR AND MAJOR ARTERIAL

NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL - MAY VARY 0.5% MIN. TO 2% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL - MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOIL.

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16 NOV 1998

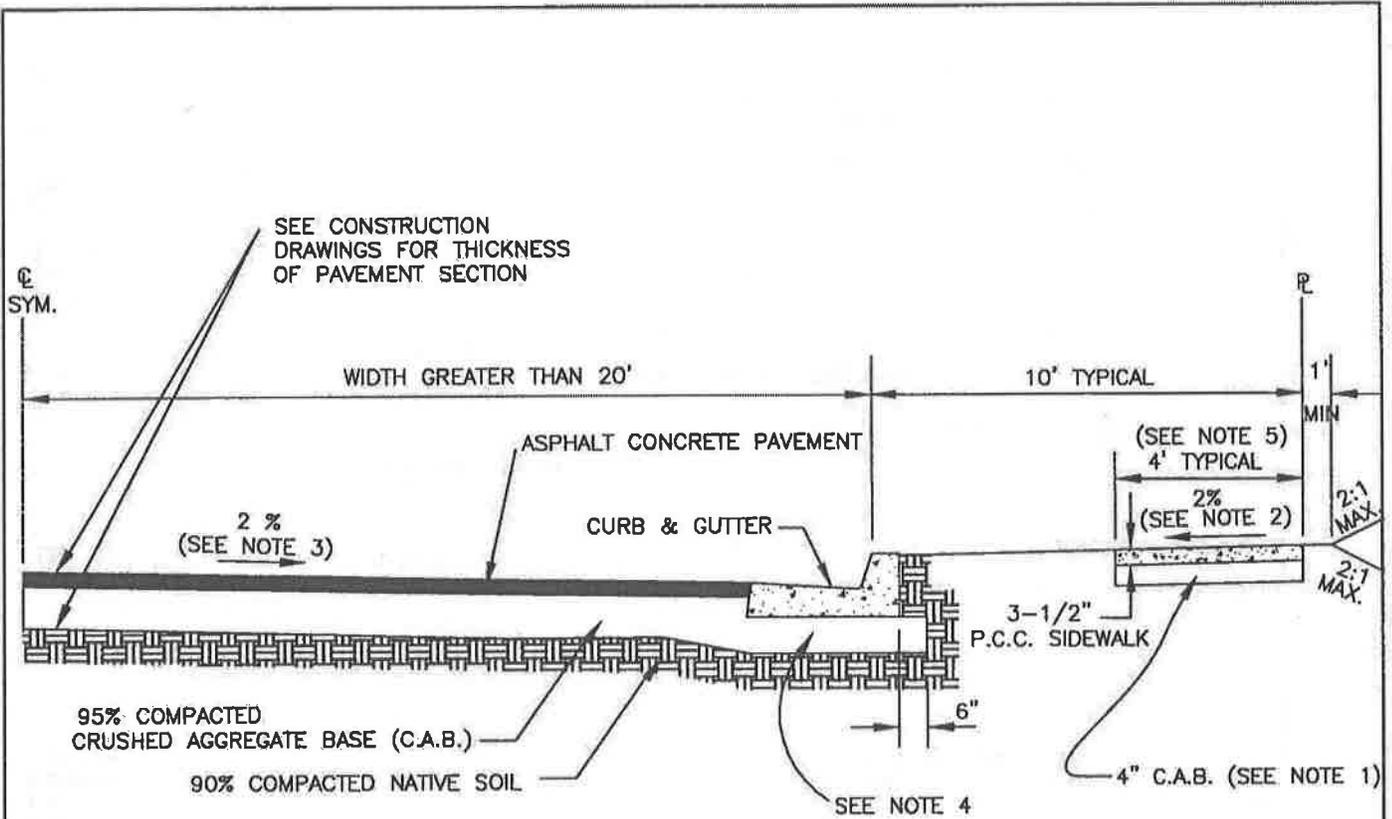
**TYPICAL SECTION
COLLECTOR AND ARTERIAL STREET**

STANDARD NO.
T103-2

RICHARD W. BURTT
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R.C.E. NO. 32862

SHEET 2 OF 2

TT/T103-22



COLLECTOR

NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL - MAY VARY 0.5% MIN. TO 2% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL - MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOIL.
5. IF SIDEWALK IS ADJACENT TO CURB, SIDEWALK WIDTH SHALL BE 5' MINIMUM AND HAVE 4' CLEAR AROUND ANY OBSTRUCTION. ALSO SEE T108 AND T109.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

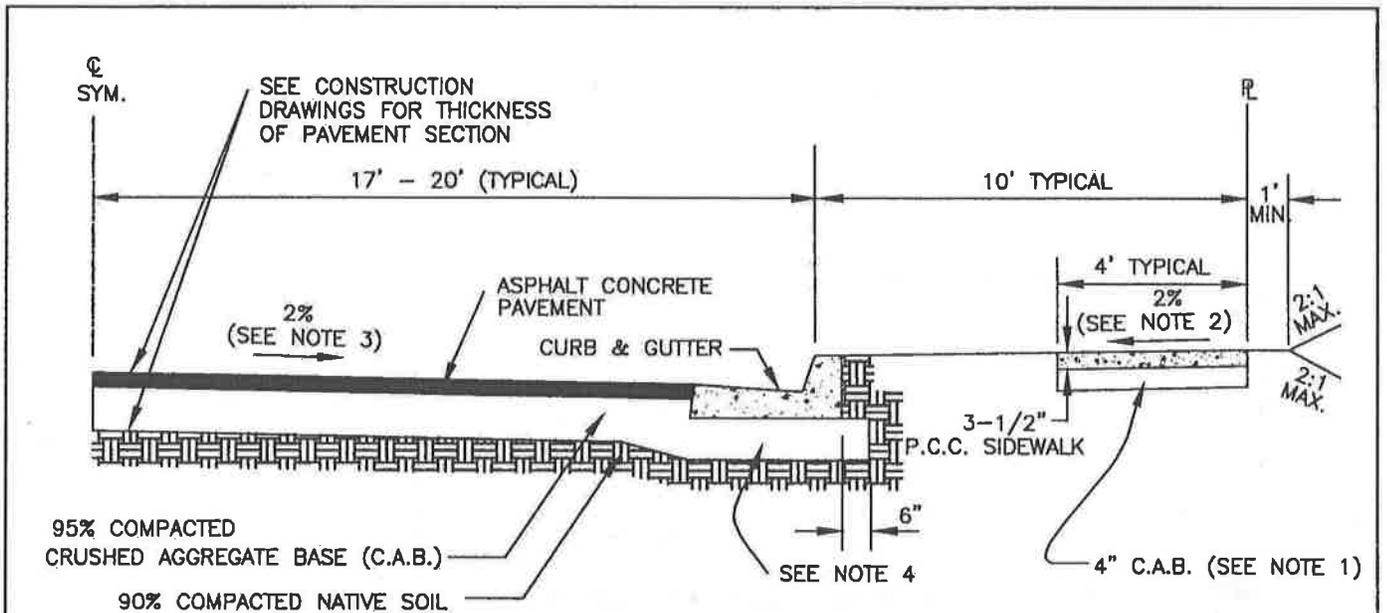
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TYPICAL SECTION COLLECTOR AND ARTERIAL STREET

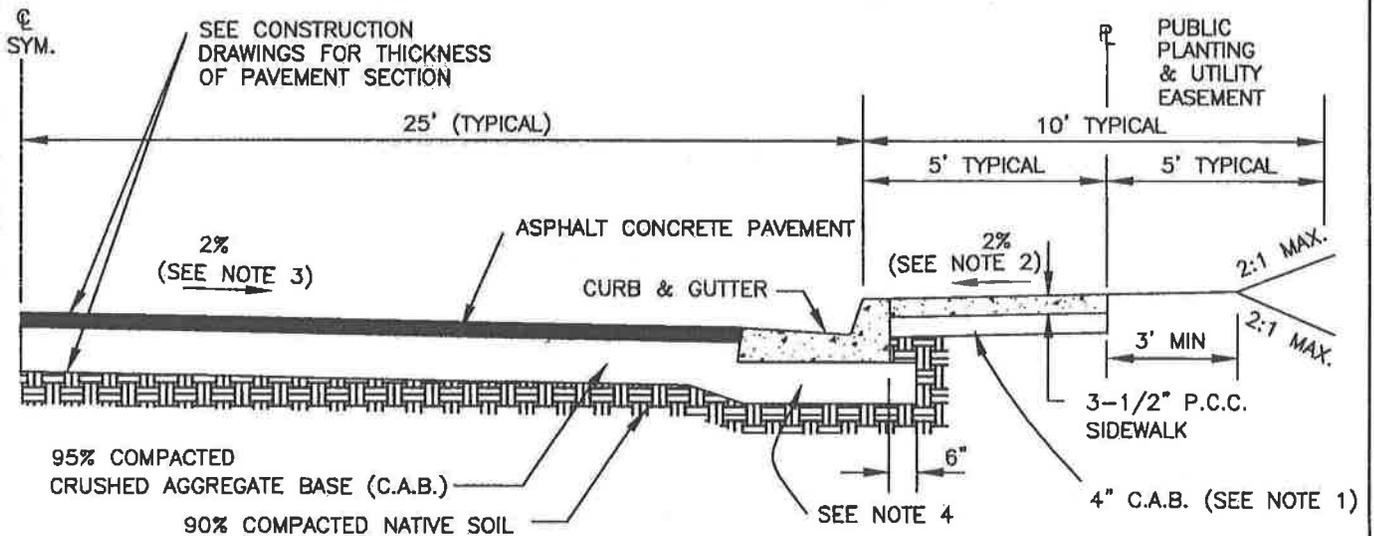
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T103-2

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SHEET 1 OF 2



RESIDENTIAL STREET



INDUSTRIAL STREET

NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL - MAY VARY 0.5% MIN. TO 2.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL - MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOILS.

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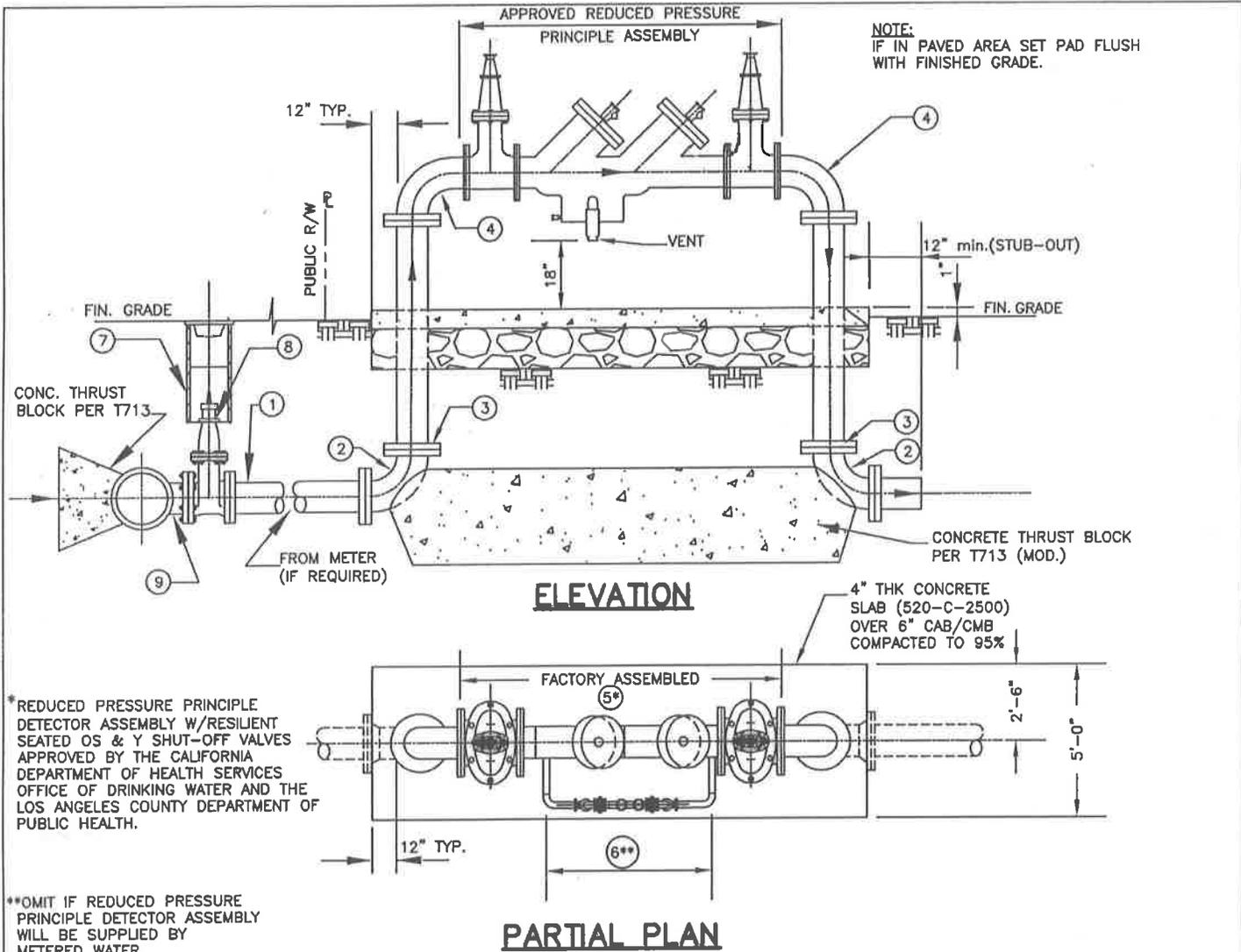
**TYPICAL SECTION
LOCAL STREET**

STANDARD NO.
T102-2

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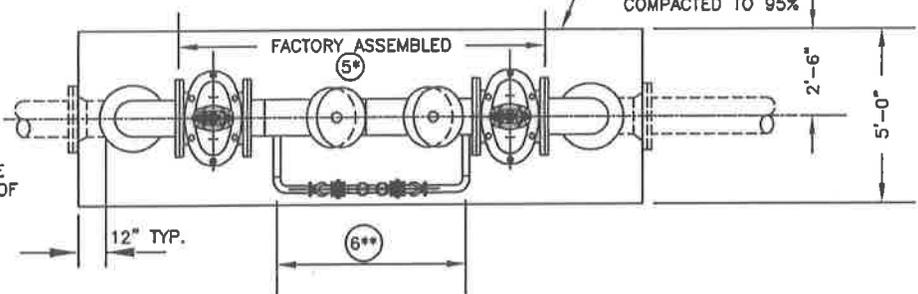
SHEET 1 OF 1

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NOTE:
IF IN PAVED AREA SET PAD FLUSH
WITH FINISHED GRADE.

ELEVATION



PARTIAL PLAN

*REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY W/RESILIENT SEATED OS & Y SHUT-OFF VALVES APPROVED BY THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES OFFICE OF DRINKING WATER AND THE LOS ANGELES COUNTY DEPARTMENT OF PUBLIC HEALTH.

**OMIT IF REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY WILL BE SUPPLIED BY METERED WATER.

ASSEMBLY SHALL BE TESTED BY A CITY APPROVED TESTER CERTIFIED BY THE LOS ANGELES COUNTY DEPT. OF PUBLIC HEALTH. THE DEVELOPER/OWNER IS RESPONSIBLE FOR THE COST OF TESTING THE ASSEMBLY.

ITEM	DESCRIPTION	SIZE
①	D.I. WATER PIPE (CLASS 350)	
②	90°, D.I. ELBOW, MJ X FLG, CLS 350	SERVICE SIZE
③	D.I. SPOOL, CLS 350 (BOTH ENDS SHALL BE FLANGED) (UNI-FLANGE SHALL NOT BE USED)	
④	90°, D.I. ELBOW, FLG. CLS 350.	
⑤	REDUCED PRESSURE PRINCIPLE ASSEMBLY	
⑥	3/4" COPPER BY-PASS ASSEMBLY (NEPTUNE WATER METER, E-CODER) R900i WITH STUBBY ANTENNA CUBIC FEET REGISTER). (3)-3/4" FIP BALL VALVES W/LOCKWING (JONES E1908, FORD B13-332WNL)	5/8"
⑦	VALVE BOX ASSEMBLY PER T712	
⑧	MUELLER NO.2360-16 GATE VALVE, MJxFLG, W/EVERDUR STEM & SS 316 FASTENERS W/2" NUT & NRS OPENING CCW.	
⑨	M.J. x FLG. DUCTILE IRON TEE OR TAPPING SLEEVE (MUELLER: H615, H616 OR H619)	

CITY OF TORRANCE

REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY > 2"

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SEPT 2011

STANDARD NO.

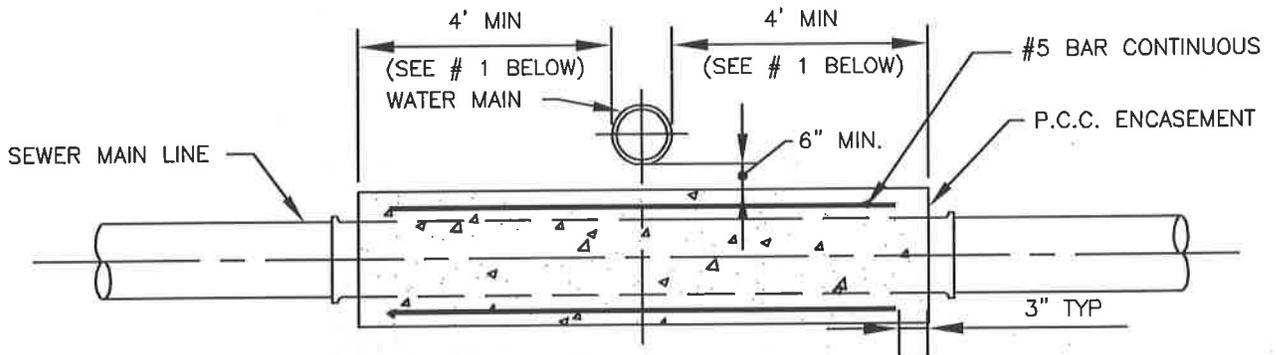
T 711

ROBERT J. BESTE
PUBLIC WORKS DIRECTOR
R.C.E. NO. 50737

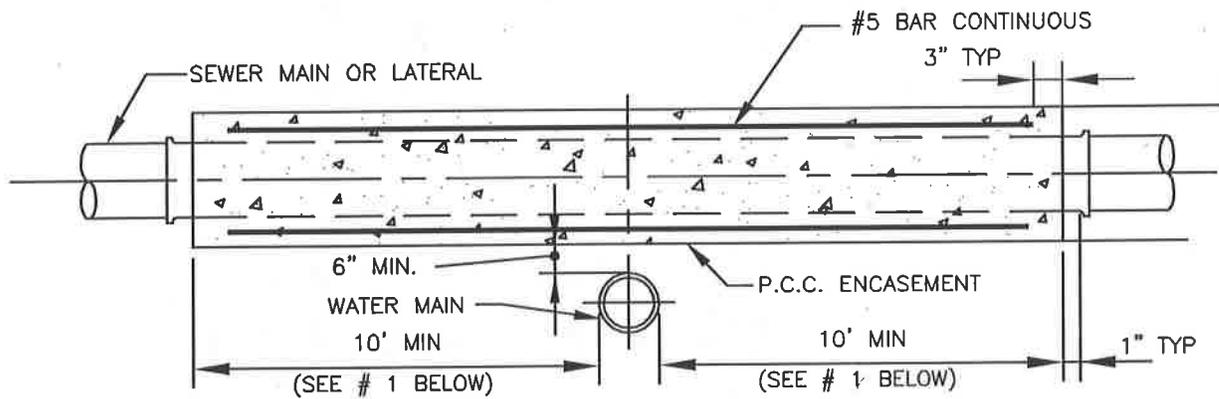
SHEET 1 OF 1

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SEWER PROTECTION ALTERNATIVE CONCRETE ENCASEMENT



SEWER LINE ENCASEMENT DETAIL FOR WATER LINE ABOVE SEWER



SEWER LINE ENCASEMENT DETAIL FOR WATER LINE BELOW SEWER

GENERAL NOTES:

1. EXTEND BOTH ENDS OF ENCASEMENT TO A POINT 1" SHORT OF FIRST PIPE JOINT BEYOND LOCATION SPECIFIED ON PLAN.
2. APPLY FORM OIL, THIN PLASTIC SHEET, OR OTHER ACCEPTABLE MATERIAL TO PIPE, TO PREVENT BOND BETWEEN PIPE AND CONCRETE.
3. USE MINIMUM CLASS 520-C-2500 CONCRETE FOR ALL CASES.

ACCOMPANYING STD. T714

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DATE ISSUED
16 NOV 1998

SEWER ENCASEMENT

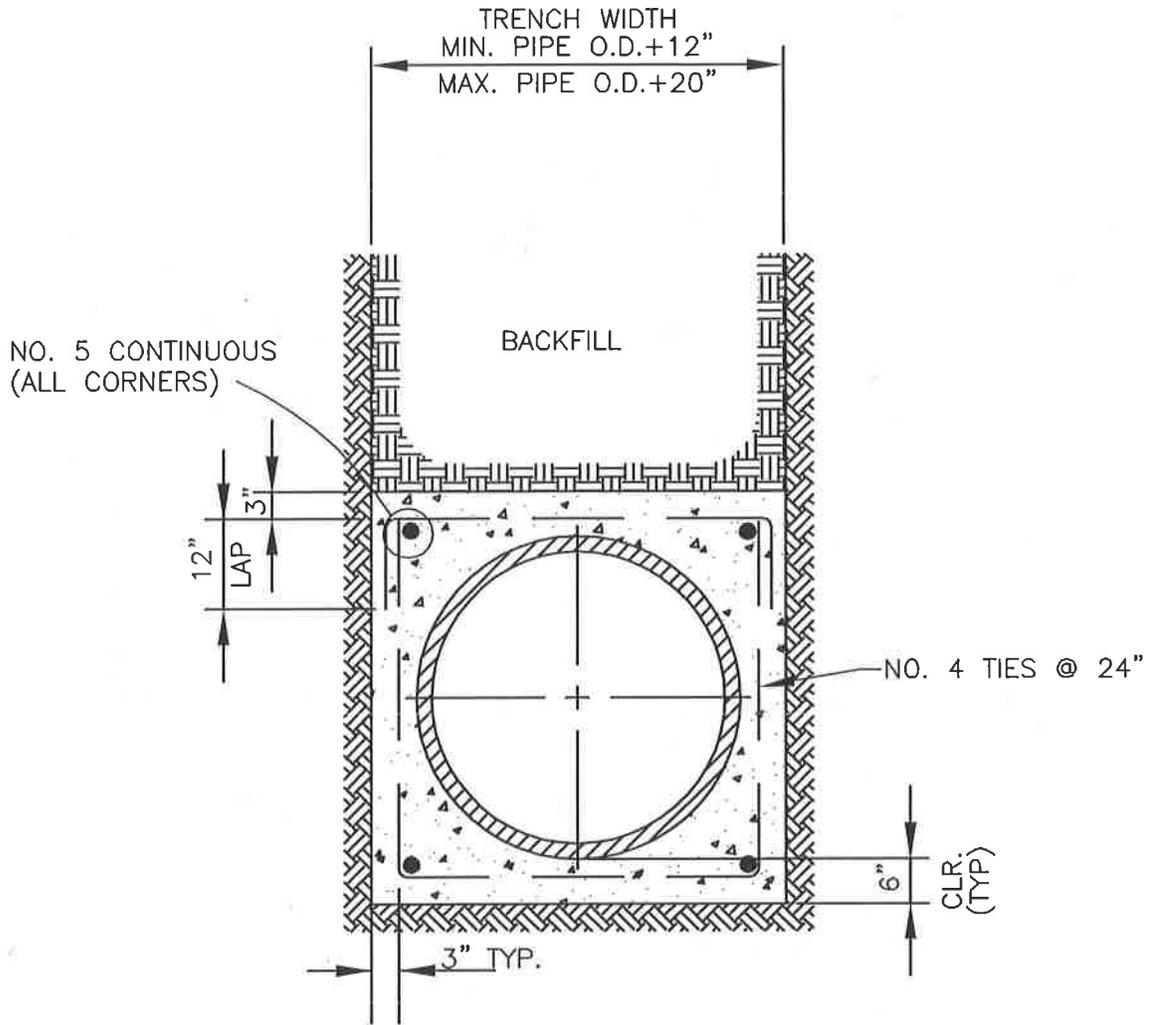
STANDARD NO.

T716-1

RICHARD W. BURTT
ENGINEERING DIRECTOR
R.C.E. NO. 32862

SHEET 1 OF 2

DV/EM/T716-1



CONCRETE ENCASEMENT DETAIL

NOT TO SCALE

ACCOMPANYING STD. T700

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED
16 NOV 1998

CONCRETE ENCASEMENT

STANDARD NO.

T716-1

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SHEET 2 OF 2

DV/EM/T716-1

APPENDIX D
RECYCLED WATER URBAN
IRRIGATION USER MANUAL

RECYCLED WATER URBAN IRRIGATION USER MANUAL



EDITION
2014

DEVELOPED BY: **LOS ANGELES WATER REUSE CALIFORNIA**

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“On-Site” Supervisor Do's and Don'ts

Do's

- Install and maintain signs at all points of entry (both pedestrian and vehicular)
- Install and maintain labels and tags on recycled, non-potable and potable water systems
- Operate irrigation system:
 - Between 10 p.m. – 6 a.m., or when site is unoccupied, if automatically controlled (unless other restrictions apply)
 - At other times if manually controlled and supervised (that is, trained use site staff is present) to ensure the recycled water doesn't come in contact with the public
 - At any time if use site has restricted public access
- Use quick couplers instead of hose bibbs on recycled water systems
- Contact water purveyor if any water system (non-potable, potable or recycled) modifications are anticipated
- Immediately contact water purveyor, recycled water producer and local Health Department if any of the following has occurred:
 - A recycled water line break, spill or off-site discharge of recycled water
 - A violation of water recycling requirements
 - A cross-connection between the recycled and potable water systems
- Educate/train site workers on safe use and restrictions of recycled water
- Keep site records and as-built drawings up-to-date and accessible
- Assist and cooperate during Periodic Visual Inspections
- Assist and cooperate during periodic Cross-Connection Testing

Don'ts

- Don't drink recycled water
- Don't use recycled water to wash hands or any other parts of body
- Don't remove recycled water identification signs, tags or labels
- Don't cross-connect two dissimilar water systems (recycled to potable)
- Don't allow recycled water to contact drinking fountains, eating areas, or any area in which food may contact the recycled water
- Don't allow recycled water to pond or puddle
- Don't allow excessive amounts of recycled water to runoff the use site property by either overspray or overwatering
- Don't use recycled water on an unapproved site
- Don't put hose bibbs on recycled water systems (unless public access is restricted)
- Don't use the same equipment on both recycled water and domestic water systems (for example, quick couplers, tools, etc.)
- Don't modify any water system without prior approval of water purveyor and local Health Department

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FOREWORD

The Recycled Water Urban Irrigation User Manual (Manual) has been prepared to convey the general rules, regulations and guidelines regarding the safe introduction and use of recycled water for landscape irrigation in Los Angeles and other areas in the State of California. This document was prepared by the Los Angeles Chapter of the California Section of the WaterReuse Association (LACWRA), which is comprised of water utilities, regulatory interests, and other entities interested in the safe introduction and use of recycled water. At the time of this publication, LACWRA included:

AECOM	Los Angeles Regional Water Quality Control Board
Black and Veatch	Metropolitan Water District of Southern California
Burbank Water and Power	MWH Americas, Inc.
California Department of Public Health	NALCO
California Department of Water Resources	Newhall Land and Farming Company
California Regional Water Quality Control Board	Pacifica Services, Inc.
California State Water Resources Control Board	City of Palmdale - Public Works Program Management
Calleguas Municipal Water District	City of Pasadena
Cannon	City of Pomona
Carollo Engineers	Precise Landscape Water Conservation, Inc.
Castaic Lake Water Agency	Psomas
CDM Smith	RBF Consulting, a Baker Company
Central Basin Municipal Water District	Red Wolf Studio
City of Cerritos	RMC Water and Environment
CH2M Hill	Rose Hills Memorial Park
Dudek	Rowland Water District
Environmental Now	SA Associates
Eurofins Eaton Analytical	Sanitation Districts of Los Angeles County
Forest Lawn	City of Santa Monica
Glendale Water and Power	Sequia Technologies
Irvine Ranch Water District	Separation Processes, Inc. (SPI)
John Robinson Consulting, Inc.	Surfrider Foundation
Kennedy/Jenks Consultants	Test America
City of Lancaster	Three Valleys Municipal Water District
Las Virgenes Municipal Water District	United Water
LEE & RO, Inc.	Upper San Gabriel Valley Municipal Water District
Long Beach Health Department	Valencia Water Company
Long Beach Water Department	City of Vernon
Los Angeles Bureau of Sanitation	Walnut Valley Water District
Los Angeles Department of Public Health	Water Replenishment District of Southern California
Los Angeles Department of Public Works	WaterReuse California
Los Angeles Department of Water and Power	West Basin Municipal Water District

Each recycled water customers' representative ("Site Supervisor") is responsible to read and understand this Manual and any water reclamation requirements applicable to their particular site. Questions about the use of recycled water or the Manual should be directed to the "Recycled Water Agency" that serves the customer.

INTRODUCTION

PURPOSE

The purpose of this Manual is to provide the recycled water “User” and “Site Supervisor” a resource for the day-to-day operation and control of that system, in order to protect the health and welfare of the personnel involved with its use, as well as that of the general public, and to protect the quality of local water resources. Recycled water is an important resource for the State of California and, in many cases, its use for non-potable applications is mandated by State law. This Manual provides necessary information to meet existing regulations for the operation of the User’s recycled water system.

Every effort has been made to ensure that this Manual is in compliance with, and is not intended to supersede, existing codes, laws, statutes and regulations of the State of California, Regulatory Agencies and local governing bodies, concerning the currently approved use of recycled water. This Manual is also not intended to supersede, but rather augment, the American Water Works Association (AWWA) California-Nevada Section’s Guidelines for Distribution of Non-potable Water or Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water.

Since legal and regulatory requirements can change without either the approval or knowledge of the Recycled Water Agency (the local producer or purveyor of recycled water), the Recycled Water Agency assumes no liability for errors in this Manual. It is the responsibility of the User to check with its Recycled Water Agency before initiating any operational or physical changes to the use site’s system.

This Manual is organized in the following manner:

- The *User’s Summary* provides a brief commentary on major topics and indicates a page number to find additional information.
- *General Provisions* covers the basic administrative requirements including authorities, responsibilities and liabilities.
- *Design and Construction* covers the considerations needed when an on-site recycled water system is first installed or modified.
- *Operation and Maintenance* covers the basic conditions for service contained in the State of California’s Water Recycling Criteria.
- *Identification and Equipment* gives the basic requirements for marking the water systems and providing signage for the use area.
- *Cross-connection Controls and Pressure Testing Procedure* outline the requirements for protecting the potable water system and keeping it separate from the recycled water system.
- *Sample Forms and Site-Specific Details* provides a summary of steps to obtain recycled water, templates of sample forms to help with inspections and a location for information specific to the use site.
- *Local Governing Agencies* provides the names, addresses and phone numbers of agencies responsible for the regulatory administration of water recycling activities.
- *Definitions* are included for terms used within this Manual.

WHAT IS RECYCLED WATER?

“Recycled water,” (also called “reclaimed water”) as used in this Manual and defined in the Water Recycling Criteria of Title 22, Division 4, Chapter 3 of the California Code of Regulations, (Title 22) refers to tertiary-treated water produced from the three-stage treatment of municipal wastewater (see box, right). *(Although secondary-treated effluent may also be reused, its applications are limited and subject to much greater restrictions, and it will not be addressed in this Manual.)* The facilities that produce recycled water are known as Water Recycling (or Reclamation) Plants that are owned and operated by “Recycled Water Producers”. The recycled water produced by these plants is delivered to users through distribution systems owned and operated by “Recycled Water Agencies.” Recycled Water Producers and Agencies can be one and the same entity.

Recycled water is virtually colorless and odorless, and is allowed for full-body human contact but *not* for direct human consumption. The sensible use of recycled water affords an excellent choice for essentially all non-potable applications. Properly managed, recycled water is safe to use.

WHAT ARE “DUAL SOURCE” SITES?

“Dual source” sites are reuse sites where both potable (domestic or drinking) water and recycled water are present. Dual sources might be necessary on sites where water is normally available for public use. For example, an elementary school may use recycled water for irrigation of its athletic fields, but would need a separate potable system to supply drinking water to its school buildings.

The Recycled Water Treatment Process

- ◆ **Primary Treatment** removes 70 to 85 percent of the organic and inorganic solids that either settle out or float to the top.
- ◆ **Secondary Treatment** mixes the remaining suspended waste solids with microorganisms and air. The micro-organisms convert the waste solids to biomass that settles out.
- ◆ **Tertiary Treatment** filters out most of the remaining solids through a granular media (for example, sand or anthracite coal) or a membrane, with the final product water being disinfected with chlorine or ultraviolet light to kill off bacteria, virus and other microorganisms.

“Dual plumbed sites” is a separate term which refers specifically to a) buildings that have both recycled and potable water serving (separate) interior fixtures, or b) individual residences that use recycled water for outside irrigation, which is dealt with later under *Periodic Cross-Connection Testing* (page 32). The public must not be allowed access to the recycled water system (such as from hose bibbs).

Water quality needs at the use site might also call for two water sources. For example, golf courses may elect to use a potable water supply to irrigate the greens and use recycled water on the fairways. (**Note:** The potable water used for this purpose is referred to as “non-potable irrigation water” after it has passed through the irrigation system backflow preventer. These water lines are to be used only for irrigation and must not be connected to restrooms, drinking fountains, food service areas, etc.)

On sites with dual sources, the potable supply must be protected with an approved backflow prevention device at the parcel boundary.

Cross-connections between the recycled water system and the potable water system are strictly prohibited.

In some cases, the interior plumbing of new buildings has been “dual-plumbed” with the site’s recycled water irrigation supply. In these instances, a separate recycled water meter serving the building is required to be installed so that any problems at the site can be isolated and fixed. It also provides the added benefit that should the irrigation need to be shut off at the meter for any reason; it will not interfere with the function of the restrooms. Title 22 requires that this dual-plumbed system must be tested for cross-connections every four (4) years (page 32). ***Retrofits of existing buildings for toilets, urinals, etc. are not permitted.***

BENEFITS OF RECYCLED WATER IRRIGATION

As population growth increases the demand for potable water and the reliability of imported water supplies decreases, the future availability of potable water for irrigation is questionable. Also, the costs of potable water supplies continue to climb, making recycled water more attractive as an alternative water supply.

The amount of recycled water available is generally not affected by drought, meaning customers don’t risk losing their expensive landscaping investment due to water shortages and potential mandatory rationing.

Tertiary-treated recycled water can be used for virtually all non-potable applications (see box, right).

Recycled water may also contain an appreciable nutrient content, such as nitrogen, potassium, calcium, magnesium, sulfur, and other macro and micronutrients, which may provide some level of fertilization during the irrigation process. A full recycled water quality analysis can be obtained from the local Recycled Water Agency.

Irrigating with recycled water is making use of a valuable resource that would otherwise be disposed.

TITLE 22 USES FOR TERTIARY-TREATED WATER

Urban Landscape – Parks and playgrounds, schoolyards, unrestricted access golf courses, residential landscaping, freeway and roadway landscaping, cemeteries, ornamental nurseries, sod farms.

Agriculture – Food crops for human consumption, orchards, vineyards, fodder, fiber and seed crops, box nurseries, non-fruit bearing trees, pasture for milking animals, water supply for livestock.

Impoundments – Restricted and unrestricted (full-body contact) recreational impoundments, decorative lakes and fountains, fish hatcheries.

Industrial – Industrial processes (such as paper manufacturing, carpet and textile dyeing, boiler feed), cooling towers and air conditioning, non-residential toilet, urinal and floor drains, structural and non-structural fire fighting, commercial laundries, commercial car washes, concrete mixing, construction (dust control, soil compaction, backfill consolidation around pipelines, including potable), street and sidewalk cleaning, flushing sanitary sewers, snow making.

ARE THERE DISADVANTAGES TO USING RECYCLED WATER?

Unlike potable water, recycled water can only be used for approved uses at approved locations, and under the provisions of established regulations, guidelines, agreements and/or permits. Because of its origins and the level of treatment provided, recycled water is not suitable for direct human consumption. According to the State DPH, there have been no known cases of illness in the State of California due to the proper use of recycled water as of the time of this writing.

In very rare occasions, there may be temporary interruptions of recycled water deliveries, as there are in any utility. Such instances are generally short in duration, and many recycled water purveyors have a back-up water supply for such events.

NEED FOR REGULATIONS

Regulations make the use of recycled water possible by ensuring consistent, reliable water quality while at the same time being fully protective of the public health. California Code of Regulations Titles 22 and 17 are the two sets of State DPH regulations that accomplish this. Title 22 establishes the requirements for recycled water treatment, quality and allowable use, while Title 17 establishes the requirements for backflow protection of the potable water supply.

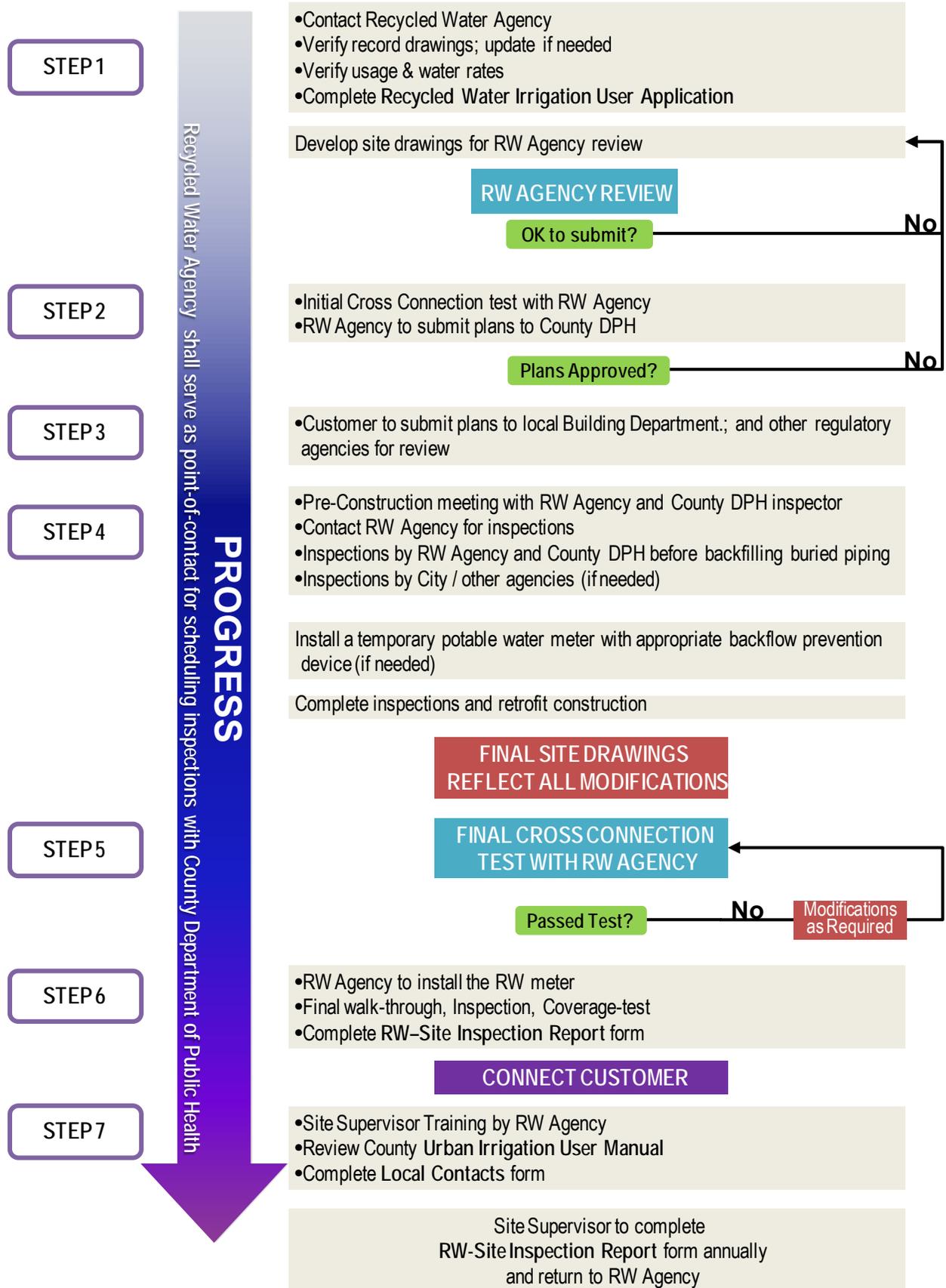
Copies of these regulations may be obtained from your Recycled Water Agency.

USER'S SUMMARY

Recycled water is a safe and effective resource for non-potable uses. Properly managed recycled water has a very limited health risk, if any. To help in the proper management of recycled water, the State of California, the local city or county Health Department and the Recycled Water Agency have developed rules and regulations for the safe use of recycled water. These rules and regulations are in place to insure that the User, its Site Supervisor and employees, and the public are protected from any health risk (real or perceived) that might be associated with the use of recycled water.

- Because recycled water is not suited for human consumption, every effort must be made to prevent the user's recycled water system from being cross-connected with the potable (drinking) water system.
- Plans must be carefully reviewed to ensure against cross-connections and that proper equipment is to be installed (*Design Approval*, page 11).
- The recycled water system must be operated under the authority of a "User's Agreement" (page 9) that outlines any special considerations or requirements for the particular use site.
- The User must designate a "Site Supervisor" (page 15) who is responsible for managing the on-site recycled water system. The Site Supervisor ensures the system is operated within the established guidelines and is properly maintained (*Maintenance*, page 18).
- In cooperation with the User, the Recycled Water Agency and/or Producer will make regular inspections of the site (*Periodic Site Inspections*, page 19).
- The User must instruct all persons using recycled water on its property of its proper use and precautions (*Personnel Training*, page 16).
- All piping and points of connection must be labeled with "**RECYCLED WATER – DO NOT DRINK**" (*Identification and Equipment*, page 22) and the universal "Do Not Drink" symbols (page 30).
- All recycled water use areas accessible to the public must be posted with signs visible to the public and must include the statement "**RECYCLED WATER – DO NOT DRINK**" (page 29) and the "Do Not Drink" symbol (page 30).
- An initial cross-connection test must be conducted to determine if there are any unknown connections between existing irrigation and potable piping prior to construction of retrofit work (*Initial Cross-Connection Test*, page 31).
- Prior to connection with the recycled water distribution system, a final cross-connection test must be performed to verify that construction or retrofit work was performed correctly (*Final Cross-Connection Test*, page 32).
- In the event of a cross-connection incident, the User must implement an emergency response plan (page 33).

For the steps that need to be taken in order to retrofit a site for recycled water use (as outlined in Section G), please refer to the flow-diagram on the following page.



SECTION A GENERAL PROVISIONS

REGULATORY AUTHORITY

Rules and regulations for the end use of recycled water are established and/or enforced by the California Regional Water Quality Control Board (Regional Board), the State DPH and the local city or county Health Department. These rules and regulations are typically contained in a permit from the Regional Board issued to the Recycled Water Agency and/or Producer. All facilities using recycled water must be designed and operated to meet the standards of the local governing codes, rules and regulations.

Various regulations for recycled water use may be outlined in the Recycled Water Agency's Recycled Water Ordinance. However, if recycled water service is provided by an Investor Owned Utility (a private water company), the various regulations for recycled water use are outlined in the Recycled Water Agency's Tariff Schedules as approved by the California Public Utilities Commission (CPUC).

From time to time there may be amendments to existing regulations. These amendments may be made without the knowledge or consent of the User or the Recycled Water Agency and will be enforced upon their effective date. The Recycled Water Agency will make every effort to make sure the User is made aware of these changes when they occur.

SYSTEM RESPONSIBILITY

The recycled Water Agency is responsible for the operation and maintenance of its recycled water distribution system up to the point of connection to the User. However, it is the responsibility of the User to

maintain its recycled water system downstream of the point of connection with the Recycled Water Agency's distribution system (usually at the meter). The User is responsible for ensuring that the recycled water is used on its site according to all the rules and regulations regarding such use. Specifically, the User is responsible for the following:

- Maintaining the use site's recycled water system.
- Ensuring that all materials used during the design, construction and maintenance of the system are approved or recommended for recycled water use by the AWWA California-Nevada Section's Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water.
- Obtaining all permits and payment of all fees required for the establishment, operation and maintenance of the User's recycled water system.¹
- Reporting all violations and emergencies to the required local governing agencies. A listing of these agencies is provided in Section H.
- Obtaining prior authorization from the Recycled Water Agency and any required regulatory agency before making any modifications to the approved recycled water system (or the potable water system if it is in close proximity to the recycled system).

¹ Permitting and/or fee assistance may be available from the Recycled Water Agency

USER AGREEMENT AND PERMITS

A potential User must complete all of the Recycled Water Agency's requirements (for example, permit application) prior to the issuance of a User Agreement. (**Note:** "User Agreement" is the term used to describe any agreement, contract, permit, ordinance, memorandum of understanding or other such document used by the Recycled Water Agency to present the terms and conditions for the use of recycled water by a User.) The Recycled Water Agency reserves the right to alter the User Agreement on a case-by-case basis.

RATE AND FEE SCHEDULE

If recycled water is provided by a public entity, such as a municipality or water district, all rates and fees concerning recycled water service will be established and fixed by the Recycled Water Agency.

If recycled water is provided by an Investor Owned Utility, all rates and fees concerning recycled water service shall be established and fixed through the CPUC.

PROTECTION OF PUBLIC HEALTH

The Recycled Water Agency reserves the right to take any action necessary with respect to the operation of the User's on-site recycled water system in order to safeguard the public health.

AUTHORIZED USES

The use of recycled water is limited to those uses approved by the Regional Board or the State DPH. Any other use of recycled water is prohibited without the prior approval, on a case-by-case basis, of the Recycled Water Agency and the appropriate Regulatory Agencies.

APPROVED USE AREAS

Recycled water may only be used in areas approved by the Recycled Water Agency, following the User's completion of the Recycled Water Agency's application procedure and its meeting all of the requirements of the applicable Regulatory Agencies.

A User may *never* supply recycled water to another owner's adjoining property or to the property of the same User across a street, alley or other public right-of-way without the prior written approval of the Recycled Water Agency and the local city or County Health Department. The User may not give or sell recycled water to another party. Should the property become sub-divided, the service will be considered as belonging to the parcel it enters directly. If such a subdivision occurs, or property ownership is transferred, the Recycled Water Agency must be notified.

In any case, recycled water lines are not permitted to cross lot lines. All recycled water delivered to any site must pass through a recycled water meter.

QUENCHING ARTIFICIAL TURF

Artificial turf in place of real grass is becoming more popular on school athletic fields. "Quenching" of an artificial turf typically occurs during daytime hours and when the athletic fields most likely are in use. In order to minimize public exposure, recycled water should not be used for this purpose. As a best management practice, potable water should be used to quench artificial turf. (*Protection of Potable Water Systems*, page 31 and *Back-up Water Source*, page 12).

LIABILITY

The User is responsible for the operation and maintenance of the recycled water system downstream of the Recycled Water Agency's point of connection with the User, unless such responsibility is clearly outlined in the User Agreement/Permit (*Enforcement*, page 21).

The Recycled Water Agency shall not be liable for any water damage or other damage caused by the User due to defective or broken plumbing or faulty service, nor shall the Recycled Water Agency be liable for damage caused by the User's facilities. This includes changes in the recycled water quality that may occur from sitting in ornamental lakes, storage tanks, pipelines, etc.

WATER SUPPLY CONTINGENCY

If at any time during construction or operation of the recycled water system, real or potential hazards are found, the Recycled Water Agency has the right and the responsibility to immediately suspend, with or without notice, recycled water service in the interest of protecting the public health.

The Recycled Water Agency may supply water to the affected area either temporarily or permanently from the potable water system with appropriate backflow protection (*Protection of Potable Water Systems*, page 31 and *Back-up Water Source*, page 12).

SECTION B DESIGN & CONSTRUCTION

DESIGN APPROVAL

Before the construction of any new or major modifications of an existing recycled water system, the design must be submitted for approval by: a) the Recycled Water Agency, b) the State and local city or county Health Departments, and c) the local city building department. Approval will be contingent upon evidence that all applicable design requirements, rules and regulations for a recycled water system are satisfied. Plans and specifications should include, but not be limited to, the following:

- A detailed description of the intended use of recycled water, including identification of the area of use.
- Details showing the complete potable and recycled water systems. For existing facilities converting to recycled water use, details must include the exact location of all existing water piping systems.
- Details of the intended installation procedures, including as a minimum: backflow preventer locations, color and type of pipe and additional signage to be used.

CONSTRUCTION

The appropriate regulatory and recycled water agencies shall have the opportunity to make periodic inspections of the User's site during the construction phase, if applicable, to ensure both materials and installations are done according to the approved plans and specifications.

The Recycled Water Agency and/or the State, local city or county Health Department or their authorized agents shall inspect the construction and startup of the

User's recycled water system to ensure that it is in compliance with the approved construction plans, rules and regulations. In addition, representatives of the Regional Board and the State DPH may be involved.

This site inspection is to ensure that proper equipment was used, spray patterns are adjusted to ensure proper coverage without excessive overspray and there are no cross-connections with the on-site potable water system. Conditions that might create runoff, ponding or windblown spray, especially on slopes, must be corrected. Spray patterns must be checked to make sure that they don't encroach upon public facilities such as drinking fountains, picnic tables or areas outside the approved use area.

RECYCLED WATER DELIVERY SYSTEM OPERATION

The Recycled Water Agency reserves the right to control and schedule the use of recycled water, if control and scheduling are necessary to maintain acceptable working conditions within that agency's recycled water distribution system. The Recycled Water Agency will administer these and other service conditions.

If the available service pressure is higher than the User can accept, the User will be responsible for providing a pressure-reducing valve downstream of the service meter. If available pressure is lower than what the User needs, booster pumping downstream of the meter may be required. Any pumping of recycled water requires the prior written approval of the Recycled Water Agency.

The Recycled Water Agency must ensure that the quality of the recycled water in its distribution system is not compromised by any User. Therefore the Recycled Water Agency may require backflow protection on the User's recycled water system. This backflow protection must be in close proximity to and downstream of the recycled water meter at the parcel boundary or at specific, on-site location(s) where an activity of the User (such as fertilizer injection) could degrade the quality of the recycled water in the distribution system. If necessary, details will be included in the User Agreement.

Backflow prevention devices (almost always a "reduced pressure", or RP, device) must be approved by the Recycled Water Agency and the State DPH and local city or county Health Department. Devices must be properly maintained, inspected quarterly and tested at least annually. Backflow prevention assemblies, when required on recycled water systems, must be conspicuously labeled. Based on the provisions of the User Agreement, the Recycled Water Agency may provide the required test equipment.

Backup Water Source

If potable water is to be used as a backup source to the recycled water system at the use site, it must be done only through an air-gap separation between the two systems and with the prior approval of the State DPH and the local city or county Health Department. The State DPH permits the use of a "swivel-ell" assembly (see sample schematic, next page) that allows for the use site's water supply to be switched between the recycled and potable water systems, *if certain stringent requirements are met* (check with your Recycled Water Agency). The swivel-ell, if installed, must

be located at the point-of-connection and be visible for frequent inspections.

FIRE PROTECTION SYSTEMS

Some recycled water use sites may also have separate potable water service connections for dedicated, on-site fire protection systems. Depending on the Class of fire protection system on the reuse site, if the fire service includes piping for delivery systems outside of buildings and the manner of on-site recycled water usage, then either single check valve, double check valve or RP backflow assemblies may be required at the fire supply meter.

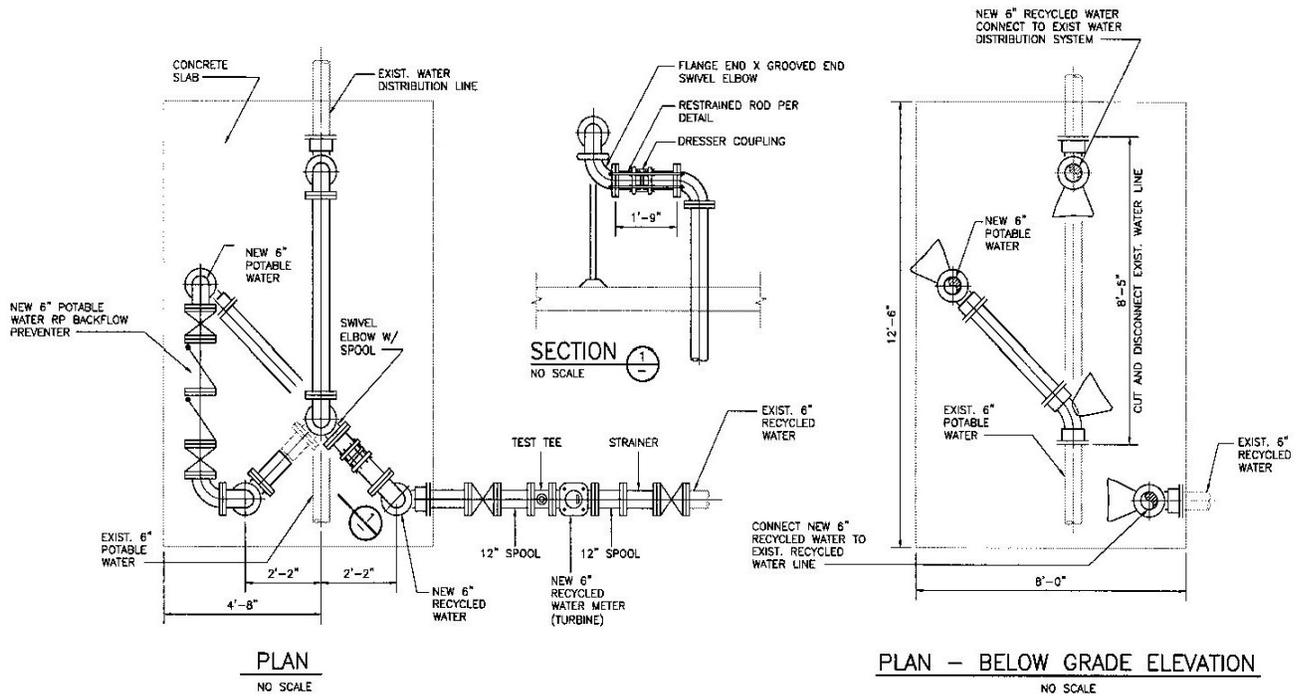
Since requirements vary from place to place, the exact requirements will be provided to the User by the Recycled Water Agency, Regulatory Agency and/or the local city or county Health Department.

PROTECTION OF GROUNDWATER

Irrigation with recycled water within 50 feet or impoundment of recycled water within 100 feet of any drinking water reservoir or well is prohibited. Proposed irrigation with recycled water within 50 feet or impounding recycled water within 100 feet of a non-potable water well requires the approval of the State DPH and local city or county Health Department.

SERVICE STARTUP

Following the acceptance of the User's recycled water system by the Recycled Water Agency, the User may request regular service startup. Upon receipt of the startup request, the Recycled Water Agency will notify the appropriate regulatory agencies, and schedule a final inspection. The startup request shall include the appropriate documentation and any payments and/or fees as indicated in the Recycled Water Agency's User Agreement.



Sample schematic drawing of a "swivel-ell" assembly for a back-up potable water supply.



Example photos of existing "swivel-ell" assemblies for a back-up potable water supply.

SECTION C OPERATION & MAINTENANCE

GENERAL

Recycled water service will be provided by the Recycled Water Agency only to those Users who have a current User Agreement for such service, unless otherwise determined by the Recycled Water Agency's Governing Board. This recycled water service can be revoked any time at the discretion of the Recycled Water Agency.

Recycled water service must be made available only in accordance with all applicable Federal, state and local statutes, ordinances, regulations and contracts, other requirements including the California Water Code, the California Code of Regulations Titles 17 and 22, and requirements and regulations imposed by the Regional Board, the State DPH, the local city or county Health Department and/or the Recycled Water Producer. The User must comply with the conditions of any User Agreement issued by the Recycled Water Agency.

Recycled Water Agencies may not deliver recycled water to Users that do not or will not comply with use site requirements.

CONDITIONS OF SERVICE

The User must comply with the following conditions.

Runoff Conditions

The irrigation systems must be designed, constructed and operated to minimize runoff outside the approved use area to the fullest extent practical. A small amount of irrigation return water leaving the site is not considered to be a violation.

Ponding Conditions

The irrigation systems must be designed, constructed and operated to minimize, ponding within or outside of the approved use area to the fullest extent practical. This does not apply to approved landscape or recreational impoundments such as golf course water hazards or decorative lakes.

Windblown and Overspray Conditions

The irrigation systems must be designed, constructed and operated to minimize windblown spray and irrigation overspray from leaving the approved use area to the fullest extent practical.

Unapproved Uses

Use of recycled water for any purposes other than those explicitly described in the Recycled Water Agency's water recycling permit is strictly prohibited.

Use in Unapproved Areas

The delivery and use of recycled water for any reason, including approved uses, in areas other than those explicitly approved in the current effective user permit and without the prior approval of the appropriate Regulatory Agencies, *is strictly prohibited.*

Supply to Separated Parcels

If a reuse site is separated into two or more distinct parcels by a public right-of-way, then each parcel must be supplied recycled water through its own individual meter. The exception to this rule is when the parcels are connected under the public right-of-way via a pedestrian or vehicular tunnel.

Cross-Connections

Cross-connections, as defined by the California Code of Regulations, resulting from the use of recycled water or from the physical presence of a recycled water service, whether by design, construction practice, or system operation, **are strictly prohibited**.

If any cross-connection is discovered, the User shall immediately depressurize the recycled water system **only**, notify the Recycled Water Agency and implement the *Emergency Cross-Connection Response Plan* (see page 33).

DESIGNATION OF SITE SUPERVISOR

It is the User's responsibility to provide surveillance and supervision of its on-site recycled water system in a way that assures compliance at all times with current regulations and the recycled water permit requirements. The User shall designate, with notification going to the Recycled Water Agency, a Site Supervisor to be the contact person with the Recycled Water Agency. The following are requirements of the Site Supervisor position:

- Receive training or be able to demonstrate knowledge of the application and maintenance of a recycled water system.
- Be familiar with the contents of this Manual.
- Be available to the Recycled Water Agency at all times and have the authority to carry out any requirements of the Recycled Water Agency.
- Be responsible for the installation, operation and maintenance of the recycled and potable water systems, and for the prevention of potential hazards.

- Ensure that notification signs at the use site are properly installed and maintained, and that all recycled and potable water facilities are properly labeled, tagged or otherwise identified.
- Be knowledgeable of the provisions contained in Titles 17 and 22 of the California Code of Regulations relating to the safe use of recycled water and maintain accurate records.
- Ensure that all site employees involved with the use of recycled water are instructed in the safe and responsible use and handling of the recycled water.
- Immediately inform the Recycled Water Agency of any failures, violations and/or emergencies that occur involving the recycled or potable water systems.
- Be familiar with the basic concepts of backflow and cross-connection prevention, system testing, and related emergency procedures, and participate in any cross-connection tests.

The Recycled Water Agency must be notified immediately of any change in personnel for the Site Supervisor position. If there is a change in the Site Supervisor, the Recycled Water Agency is responsible to assure that the new Supervisor has been trained in accordance with *Personnel Training* (page 16). The Recycled Water Agency will provide periodic inspections of the User's system and report all violations to the Site Supervisor and all appropriate Regulatory Agency according to applicable procedures established by law, code, permit or practice.

PERSONNEL TRAINING

All new employees must be trained in the proper use of recycled water. Supervisory personnel and the Site Supervisor should ensure that employees are not using recycled water carelessly or improperly. It is the responsibility of the User to train all operations personnel so they are familiar with the use of recycled water. Any training program should include, but not be limited to, the following:

- Operations personnel must be aware that recycled water, although highly treated, is non-potable. ***Recycled water may never be used for human consumption.***
- Operations personnel must understand that working with recycled water is safe if common sense is used and appropriate regulations are followed.
- Operations personnel must understand that conditions such as ponding and runoff are not allowed.
- Good personal hygiene must be followed (for example, washing hands after working with recycled water).
- Operations personnel must understand that there is ***never to be a direct connection*** between the recycled water system and the potable water system.

IRRIGATION SYSTEM OPERATION

Operation of the User's on-site recycled water system must adhere to the following requirements:

- The recycled water system must be operated to prevent overspray or windblown spray into unapproved areas.
- Automatic control systems are to be used and programmed to prevent ponding and runoff of recycled water.

- Even though tertiary-treated recycled water is approved for full-body contact by the State DPH, irrigation may only occur during periods of least use of the approved area by the general public to avoid inadvertent and involuntary contact. This is usually between the hours of 10 p.m. and 6 a.m.; however, areas where public access is generally prohibited or minimized, such as freeway landscaping and commercial nurseries, may be irrigated at any time.
- Irrigation of public areas during other times may be performed if the irrigation system is operated manually and is supervised by trained personnel to avoid inadvertently exposing any members of the general public. This provision must be strictly followed.



Inadvertent public contact with recycled water irrigation spray must always be avoided.

- Consideration should be given to allow a reasonable dry-out time before the area is to be used by the public.
- The recycled water system must not be allowed to operate for periods longer than needed to satisfy the landscape water requirements. Recycled water must never be applied at a rate that is greater than the infiltration rate of the soil. Exceptions to this requirement for purposes such as leaching of soil must be specified in the User Agreement.

HOSE BIBS

Hose bibs or other appurtenances that might allow public access to the recycled water system for possible consumption, unapproved use or cross-connection to the potable water system are strictly prohibited in all areas accessible to the general public. In these areas, only quick-couplers are allowed and must be of a different type than those that may be used on the use site's potable water system (page 26). Hose bibs may be used on the recycled water system in areas that do not allow any public access but must be conspicuously labeled "**RECYCLED WATER -- DO NOT DRINK**" in both English and Spanish (or any other language determined by the Water Recycling Agency to be in common use in the area), along with the "Do Not Drink" symbol (page 30).



Hose bibs may only be used with recycled water in areas where they cannot be accessed by the general public (such as this commercial nursery), and even those must be properly labeled.

Workers in these areas must be instructed not to drink from these hose bibs and be provided a safe source of drinking water.

In general, hose bibs supplied with recycled water are strictly prohibited in areas accessible by the general public due to the possibility of people utilizing the hose bib to drink the recycled water. However; Assembly Bill 803 (signed by the Governor in October 2013 and effective January 1, 2014) approved hose bibs for use at cemeteries (for filling vases and urns) that are supplied with disinfected tertiary recycled water and where adequate signage and labeling are in place and regularly inspected by the Recycled Water Agency, State DPH, local city or county Health Department or water purveyor to insure the general public has proper notice.

DRINKING FOUNTAINS

Drinking fountains located within the approved use area must be protected from contact with recycled water by direct application through irrigation or other approved use. Lack of protection of such facilities, whether by design, construction practice or system operation, ***is strictly prohibited.***



The pattern on the walls indicates that this drinking fountain is being sprayed by the irrigation water. If recycled water is to be used, then the spray pattern must be altered or the drinking fountain somehow shielded.

EQUIPMENT CLEANING

Any device, hose, pipe, meter, valve, tank, pump, truck, etc. which has been used with recycled water may not be used to convey potable water nor attached to the potable water system unless it is cleaned and disinfected.

MODIFICATIONS

The User must not make any modifications to its on-site recycled water system (or potable system, if it is in close proximity to the recycled system) without the prior approval of the Recycled Water Agency.

This includes modifications to the approved plans or to an operational system. Detailed plans of any system changes should be submitted to the Recycled Water Agency and the modifications inspected by the Recycled Water Agency before their being placed in operation.

However, routine maintenance of the irrigation system, such as pipeline repairs, sprinkler head replacement and other similar activities that do not result in a substantial change in either the recycled or potable water systems, or any agreed to operating plans, do not need prior approval by the Recycled Water Agency.

Emergency modifications or repairs that must be made by the User to its system in order to prevent contamination, damage or a public health hazard are covered under *Emergency Procedures* (page 20).

MAINTENANCE

The User must implement a preventive maintenance program that will ensure that the recycled water system always remains in compliance. A preventive maintenance program should include but not be limited to the following:

- Regular inspections should be conducted by the User of the entire recycled water system including sprinkler heads, spray patterns, piping and valves, pumps, storage facilities, lakes, controllers, signage, etc. Immediately correct any problems.
- All notification signs, labels and/or tags should be checked for their proper placement and readability. Replace damaged or unreadable signs, labels or tags.
- Special attention should be given to spray patterns to eliminate ponding, runoff and wind-blown spray conditions.
- Establish and maintain an accurate records-keeping system of all inspections, modifications and repairs.
- Broken sprinkler heads, faulty spray patterns, leaking pipes or valves, etc. must be repaired as soon as the malfunction becomes apparent.
- A maintenance program for backflow prevention assemblies that includes at least annual testing by a tester certified by the American Backflow Prevention Association (ABPA) or AWWA must be carried out. Records of annual tests, repairs and overhauls must be kept by the user with copies forwarded to the Recycled Water Agency and the local city or county Health Department.

PERIODIC SITE INSPECTIONS

Following conversion to recycled water use, each site is expected to maintain the requirements put in place to assure safety and avoid cross-connections. The inspection of recycled water sites was established by the State DPH in order to provide a process to reduce the potential for potable water systems to become cross-connected with recycled water (California Water Code Section 13523.1(b)(5)).

Inspections are to be performed by the agency responsible for the recycled water permit, or by its designee. The requirement is for “periodic” inspections. This can be done annually in the case of sites with more complex potable and recycled water systems. Some sites present a lesser risk and may be inspected less frequently.

Most sites require that the Site Supervisor to be present during the inspections. However, some sites, like medians, Caltrans’ irrigation sites, and smaller parks have only recycled water at the facility. Without potable water on site, there is minimal potential for a cross-connection to occur. These sites can be inspected by the Recycled Water Agency without the participation of the on-site supervisor.

The inspector should bring drawings of the site to locate significant components and for comparison to the actual site. The inspector will check for signs posted at the designated location, that valves and control boxes are correctly labeled and that no significant changes to the site in comparison to the site drawings on file. Should the inspection indicate a modification has taken place that increases the potential for a cross-connection, the Site Supervisor must be contacted immediately to determine the nature of the changes.

A conspicuous change, such as the addition of a new building or drinking fountain since the last inspection, would merit the immediate depressurization of the recycled water system until a shut-down test can be performed (see *Periodic Cross-Connection Test*, page 32) by the local city or county Health Department.

Sites with both recycled water and potable water use (for drinking fountains, restrooms or ornamental fountains, etc.) on-site require the participation of the Site Supervisor (or his designee). These sites present a greater potential for cross-connection and a higher level of participation to protect public safety.

The inspector and Site Supervisor will check for signs posted at the designated location, valves and control boxes are correctly labeled, the backflow prevention device inspection is up-to-date and that no significant changes to the site in comparison to the site drawings on file. At this time, it would be appropriate to determine if there are any future plans for the site. To document the inspection and reinforce the Conditions of Use, the Site Supervisor should sign off on the inspection or other official documentation.

Non-Critical Changes Found During Inspection

If changes are made that are non-critical (such as minor changes to the irrigation system not in proximity to the potable system), the site drawings are to be updated and submitted to the local city or county Health Department.

Critical Changes Found During Inspection

If changes are found during an inspection that would increase the potential for a cross-connection (major changes to either the potable or recycled water pipelines bringing them in closer proximity), the local city or county Health Department should be contacted immediately for consultation. When in doubt, recycled water should be shut off at the meter (leaving the potable water pressurized) until such time as the local city or county Health Department can arrange a shut-down test.

Once the public safety can be assured, the drawings for the site must be updated and provided to the local city or county Health Department.

Should a cross-connection be discovered during the inspection, the ***Emergency Cross-Connection Response Plan*** (page 33) should be immediately invoked by the Site Supervisor.

EMERGENCY PROCEDURES

In case of a major earthquake, the Site Supervisor should immediately inspect the potable and recycled water systems for damage. If either system appears damaged, both water systems should be shut off at their respective points of connection. The Site Supervisor should immediately contact the Recycled Water Agency for further instructions.

Emergency Modifications

Emergency modifications or repairs can be made by the User to the recycled water system without the prior approval of the Recycled Water Agency to prevent contamination, damage or a public health hazard. As soon as possible the User must notify the Recycled Water Agency of the

emergency modifications and file a written report.

Unauthorized Discharge

It is the responsibility of the User to report to the Recycled Water Agency all system failures that result in an unauthorized discharge of more than 50,000 gallons of tertiary-treated recycled water (or 1,000 gallons for any lesser quality recycled water). An immediate oral report followed by a written report (email is preferable) is required.

Contamination of Drinking Water

In case of contamination of the potable water system due to a cross-connection on the User's premises, the Recycled Water Agency and the local city or county Health Department must be immediately notified by the User (page 33). The User is to immediately invoke the ***Emergency Cross-Connection Response Plan***.

VIOLATIONS

The Recycled Water Agency reserves the right to decide if a violation of the conditions under which the User Agreement was issued has occurred. Violations may include non-compliance of any of the following prohibitions: runoff conditions, ponding conditions, windblown spray conditions, leaks or spills resulting from broken or damaged pipelines or appurtenances, unapproved uses, disposal in unapproved areas, cross-connections, unprotected drinking fountains and unauthorized or prohibited use of hose bibs, whether willful or by accident. Any willful or accidental act of noncompliance with any existing Federal, state or local ordinance, code, law or statute regulating the use of recycled water constitutes a violation.

NOTIFICATION

It is the responsibility of the Site Supervisor to immediately notify the Recycled Water Agency of any failure or cross-connection in his/her recycled or potable water system, whether or not he/she believes a violation has occurred. It is also the responsibility of the Site Supervisor to immediately notify the Recycled Water Agency of any violation he/she believes has or might imminently occur because of any action the User's personnel might take during the operation of the recycled or potable water systems.

It is then the Recycled Water Agency's responsibility to notify the Recycled Water Producer (if a separate entity) holding the master water recycling permit from the Regional Board and local governing agencies of any violations. These agencies are listed in Section H.

CORRECTIVE ACTION

If the Recycled Water Agency's investigation reveals that a violation has occurred on the use site, that agency must immediately notify the User of the violation and what corrective actions must be taken. It is the responsibility of the User to immediately initiate corrective action to eliminate the violation. If the Recycled Water Agency believes the violation constitutes a hazard to public health, the Recycled Water Agency must immediately stop recycled water service to the User. It will be at the discretion of the Recycled Water Agency to decide if a violation has been adequately addressed.

The Recycled Water Agency may impose a startup fee upon resumption of service to a User whose service has been terminated, depending on the provisions of the User Agreement.

ENFORCEMENT

The Recycled Water Agency shall enforce all existing regulations concerning the use of recycled water and the on-site recycled water systems. Regulations concerning the use of any recycled water or recycled water system shall be applied with equal force and effect to any person, persons or firm, public or private. ***There will be no deviations from these regulations*** except upon written authorization of the Recycled Water Agency, acting within applicable regulations. An appeal procedure may be provided for in the User Agreement or in the Recycled Water Agency's rules and regulations, and the action of the Recycled Water Agency will be final.

CAUSES FOR TERMINATION OF SERVICE

The Recycled Water Agency reserves the right to revoke a User's Agreement if any or all of the service conditions are not satisfied at all times. Service to a User may be terminated any time if:

- The Recycled Water Agency's distribution system is not capable of supplying recycled water.
- The quality of the recycled water does not comply with the requirements of the Regulatory Agencies.
- The User's operation does not conform to all applicable regulations, permit requirements and/or the terms of the User's agreement.
- There is nonpayment of service fees and charges by the User.

SECTION D IDENTIFICATION & EQUIPMENT

GENERAL

All materials, apparatus, piping, valves, controllers, sprinkler heads, pumps etc. for new recycled water irrigation systems must be approved for use in a pressurized recycled water system and installed according to approved plans. The recycled water system must conform to the AWWA California-Nevada Section's Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water. Deviations from these standards will not be allowed without prior approval. System installation must conform to the Uniform Plumbing Code and all other local codes, rules and regulations.

The approved use area must be clearly marked. All outlets from the recycled water system must be marked "**CAUTION – RECYCLED WATER – DO NOT DRINK.**" In addition, signs must be posted at all entrances to the use site indicating that recycled water is used for irrigation purposes. The "Do Not Drink" symbol (page 30) must be present on all signs. Recycled Water Agencies may also choose to require the signs to include translations into the appropriate foreign language(s), as not all locales have Spanish as the second language.

PIPING, BELOW-GRADE

It should be noted that there are no local or state requirements for a use site that is converting to recycled water to dig up and replace its existing irrigation system with new "purple" recycled water piping. However, any and all new piping must be installed according to the approved plans and marked as required. Installation must be in accordance with the latest edition of

International Association of Plumbing and Mechanical Officials (IAPMO) Standard IS-8. Fittings, primers and solvents must be IAPMO listed. All new recycled and potable water lines (pressure/non-pressure), new and existing valve boxes and appurtenances must be identified to clearly distinguish between recycled water and potable water systems.

Identification of Recycled Water Lines

All new, buried recycled water lines (pressure/non-pressure) must be extruded purple-colored Schedule 40 (minimum) PVC pipe with continuous wording "**CAUTION – RECYCLED WATER**" printed on opposite sides of the pipe. The use of continuous lettering on 3-inch minimum width purple tape with 1-inch black or white contrasting lettering bearing the continuous wording "**CAUTION – RECYCLED WATER**" permanently affixed at 10-foot intervals atop all horizontal piping, laterals and mains is an acceptable alternative to the purple pipe. Identification tape must extend to all valve boxes and/or vaults and exposed piping.



Recycled water pipeline installation with continuous purple warning tape.

Piping buried under pavement must be sleeved with the sleeve being at least two (2) inches larger in diameter than the irrigation pipe.

When recycled and potable water lines cross, the recycled water line must be located at least 1-foot below the potable water line. If this separation is not possible, then either the recycled or potable water line must be sleeved to ten (10) feet on either side of the crossover. Parallel recycled and potable water lines must be at least ten (10) feet apart, or at least four (4) feet, if the recycled line is enclosed in a sleeve. See excerpt on next page from State DPH's 2003 Memorandum No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines.

Identification of Potable Water Lines

New buried potable lines must be identified by continuous lettering on 3-inch minimum width blue tape with 1-inch white or black lettering bearing the continuous wording "**POTABLE WATER**" permanently affixed at 10-foot intervals atop all horizontal piping, laterals and mains. Identification tape must extend to all valve boxes, vaults and exposed piping. "**CAUTION – POTABLE WATER LINE BURIED BELOW**" is also acceptable language. The End User should schedule a pre-construction meeting with the Recycle Water Agency and local city or county Health Department inspector to confirm site specific requirements.

Identification tape is not necessary for extruded blue-colored PVC with continuous wording "**POTABLE WATER**" printed in contrasting lettering on opposite sides of the pipe.

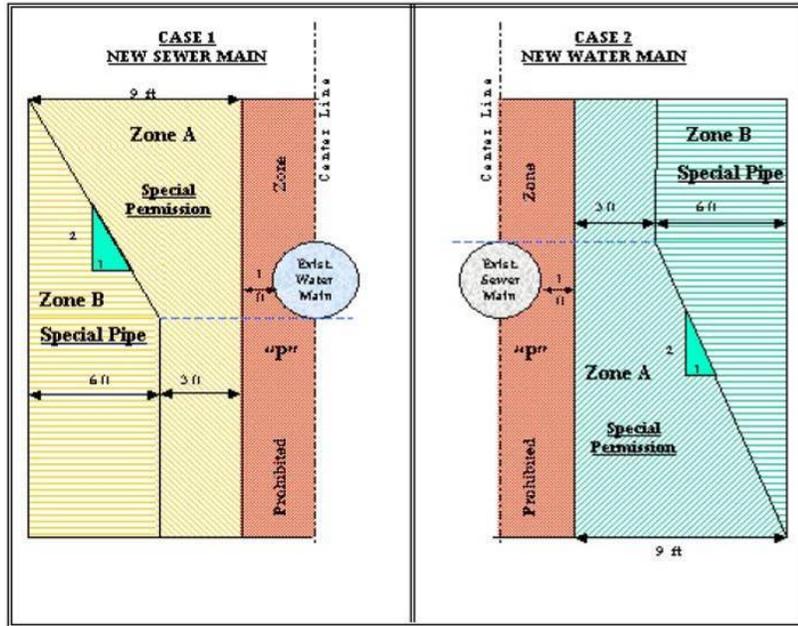


1-inch potable water copper service with POTABLE WATER identification tape affixed



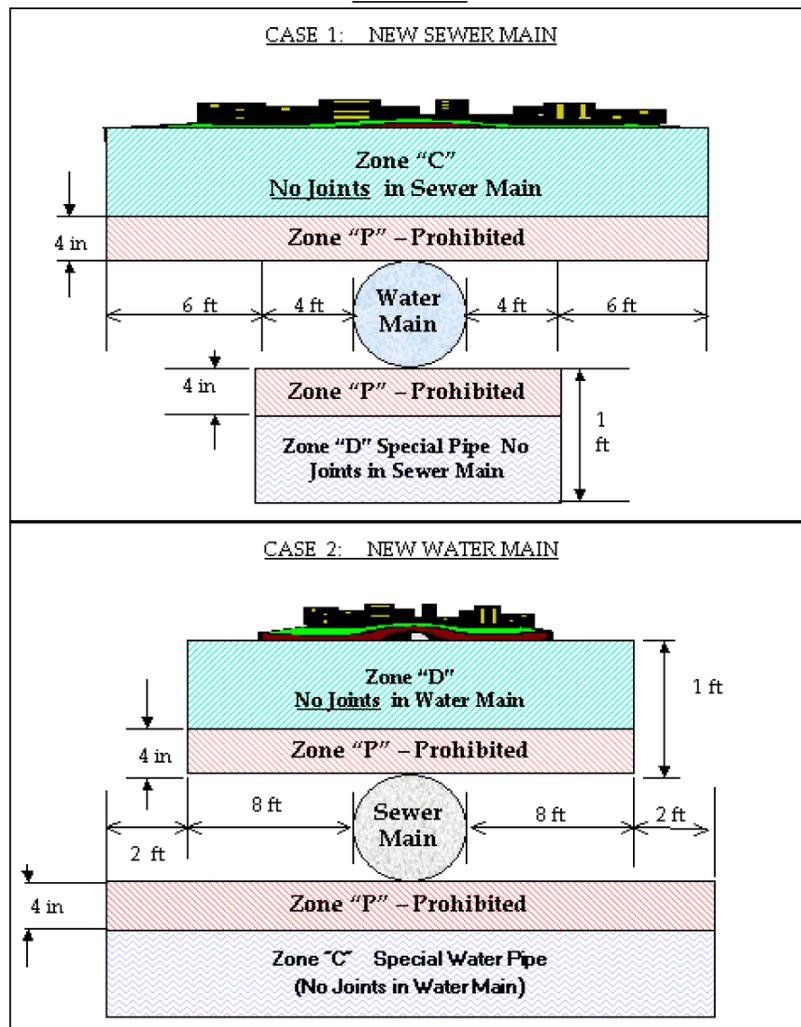
6-inch potable water HDPE mainline with POTABLE WATER identification tape affixed

Parallel construction criteria



Note:
 -Zones identical on either side of center lines.
 -Zones "P" is a prohibited zone. Section 64630 (e) (2) California Code of Regulations, Title 22 (Current); or Section 64572 (a) California Code of Regulations, Title 22 (proposed)

Crossings criteria.



Identification of Non-Potable Water Lines

“Non-potable water” is water supplied from the potable water system through an appropriate backflow preventer. All non-potable irrigation/industrial water lines (pressure/non-pressure) must be identified by continuous lettering on 3-inch minimum width yellow tape with 1-inch contrasting lettering bearing the continuous wording **“NON-POTABLE WATER – DO NOT DRINK”** permanently affixed at 10-foot intervals atop all horizontal piping, laterals and mains. Identification tape must extend to all valve boxes and/or vaults, exposed piping, hydrants and quick couplers.



Non-potable water identification tag (yellow)

Identification of Existing Below-Grade Water Lines

Existing below-grade piping, whether recycled, potable or non-potable, need not be marked unless the piping becomes exposed, such as during installation of new pipe or maintenance of existing pipe. The exposed section should be appropriately marked (as recycled, potable or non-potable) to the extent feasible.

PIPING, ETC., ABOVE-GRADE

All above-grade recycled water pipelines must be appropriately labeled and color-coded purple to differentiate recycled water pipelines from potable and non-potable water pipelines. If purple pipe is not used,

recycled water pipelines are to be wrapped “barber-pole” style with purple warning tape having the words **“CAUTION – RECYCLED WATER”** visible in contrasting black letters. Flexible conduits or hoses must be clearly marked **“CAUTION – RECYCLED WATER”** with each adapter or fitting painted purple.

Above-grade potable water pipelines must be labeled and color-coded blue to differentiate potable water pipelines from recycled and non-potable water pipelines. Potable water pipelines may be wrapped, “barber-pole” style, with blue identification tape having the words **“POTABLE WATER”** visible in contrasting white letters.

Above-grade non-potable water pipelines must be appropriately labeled and color-coded yellow to differentiate non-potable water lines from recycled water and potable water lines. Non-potable water lines may be wrapped, “barber-pole” style, with yellow identification tape having the words **“NON-POTABLE WATER – DO NOT DRINK”** visible in contrasting letters.



Potable water reduced-pressure backflow device with a POTABLE WATER identification tag



Potable water hose-bib with a POTABLE WATER identification tag

Exposed valve boxes, vaults, quick coupling valves, outlets and related appurtenances must be color-coded, labeled or tagged, to differentiate recycled water from potable water (that is, **“CAUTION – RECYCLED WATER – DO NOT DRINK”** in black or white contrasting lettering on a purple background, or **“POTABLE WATER”** in white lettering on a blue background or **“NON-POTABLE WATER – DO NOT DRINK”** in contrasting lettering on a yellow background).

Tags must be identified with the appropriate wording on both sides. Tags identifying recycled water must have both the appropriate wording and the “Do Not Drink” symbol (page 30).

VALVES

Quick Coupling Valves

New quick coupling valves, made specifically for recycled water use, should be 3/4-inch or 1-inch nominal size and of brass construction with a normal working pressure of 150 psi. The covers on all new quick coupling valves must be permanently attached and made of purple

rubber or vinyl with the words **“RECYCLED WATER”** imprinted on the cover, and must be provided with a lock. To prevent unauthorized use, the valve should be operated only with a special coupler key with an acme thread for opening and closing the valve. New quick coupling valves should be installed approximately twelve (12) inches from walks, curbs, headboards or paved areas. All new and existing quick coupling valves must be identified with an identification tag and installed in a valve box. This valve box does not necessarily have to be marked or made of purple PVC, so long as the quick-coupler cap is purple and the valve is appropriately tagged.

Quick couplers may be used on the potable water system at dual source sites if they are of different size and/or thread than the recycled water quick couplers.



Tagged quick coupler and valve box

Gate Valves

New gate valves should be installed in a marked valve box with crushed rock in the base and a notification tag on the valve operator.

Remote Control Valves

New and existing remote control valves should be installed in a marked valve box with crushed rock in the base and an identification tag on the operator. For each valve system, remote control valves should be adjusted so the most remote sprinkler heads operate at the pressure recommended by the manufacturer giving a uniform distribution of water.



Tagged remote control valve

SPRINKLER HEADS

New sprinkler heads must be of the size, type, pressure, radius of throw and discharge as indicated on the approved plans. All new sprinkler heads, either permanent or temporary, should be of the approved type for use with recycled water and create the minimum amount of mist. Drainage through sprinkler heads is prohibited, and an anti-drain valve must be installed in the sprinkler riser as needed. Anchors on sprinkler risers should be provided as needed and maintained. Sprinkler heads must be kept in good repair at all times.



Recycled water sprinkler head with identifying cap

Existing sprinkler heads do not need to be changed when the site is converted to recycled water. Any modifications to existing sprinkler heads shall reflect the guidelines set forth in this manual for recycled water use.

SYSTEM CONTROL DEVICES

New system controllers must be automatic with multiple start/stop times for any 24-hour period and installed according to the approved plans and local codes. Two, color-coded diagrams must be prepared for the station and system for each controller. Each diagram should be sealed in plastic with one copy placed in the controller box and the other given to the Recycled Water Agency. All controllers must be marked with the words “**RECYCLED WATER**” in black 1-inch high letters on a purple background.

STORAGE TANKS & IMPOUNDMENTS

All storage tanks, either stationary or portable, must be structurally sound and free from leaks. Each tank must be conspicuously marked with signs with the words **“RECYCLED WATER – DO NOT DRINK”** in black letters 2-inches high on a purple background. The “Do Not Drink” symbol (page 30) should be present on all recycled water storage tanks.

Impoundments (lakes) that receive recycled water are classified as “unrestricted” (swimming and body contact allowed), “restricted” (no swimming or body contact, but non-contact activities such as fishing and boating allowed) or “ornamental” (no recreational activities allowed). All of these impoundments must have the recycled water valves and outlets marked or tagged with the words **“RECYCLED WATER – DO NOT DRINK.”** At restricted and ornamental impoundments, adequate measures must be taken to prevent body contact. All recycled water impoundments must be kept separate from potable water wells (at least 100 feet) and reservoirs.

If any storage tank or impoundment receives both recycled and potable water, the potable water supply must be properly air-gapped to avoid a cross-connection.

OTHER DEVICES

All air/vacuum relief valves, valves, pressure reducing valves, pumps, pump control valves, etc. must be tagged or labeled indicating whether it is on the recycled water, non-potable water or potable water system. Recycled water tags or labels must have a purple background with black lettering stating **“RECYCLED WATER – DO NOT DRINK.”**

The “Do Not Drink” symbol (page 30) must be present.

Potable water tags or labels must have a blue background with **“POTABLE WATER”** in white lettering.

Non-potable water tags or labels must have a yellow background with **“NON-POTABLE”** in black lettering.

VEHICLE IDENTIFICATION

Any vehicle used to transport recycled water must be clearly marked with labels or signs that contain the words **“RECYCLED WATER – DO NOT DRINK”** in black 2-inch high letters on a purple background and include the “Do Not Drink” symbol (page 30). One label or sign should be placed on the tank closest to the driver’s door, with a second label or sign being placed on the rear surface of the tank at the outlet. All labels and signs must be placed where they can easily be seen by the personnel using the vehicle.

Any vehicle used for the transportation or storage of recycled water must not be reused for the transportation or storage of potable water, unless it has been flushed, disinfected and tested.

POSTING APPROVED USE AREA

Posting the use of recycled water is required at all entrances to the User's facility, and placed where they can be easily seen. The signs must indicate that "**RECYCLED WATER**" is in use. In addition, all signs must include the "Do Not Drink" symbol (page 30) and use the words "do not drink," in both English and Spanish (or other locally used language). Additional signing may be required by the Regulatory Agency on a case-by-case basis.



Recycled water notification signs do not need to include such words as "Caution," "Warning" or "Danger."



Recycled water notification signs can use either symbol as shown on the next page.

“DO NOT DRINK” SYMBOLS



SECTION E CROSS-CONNECTION CONTROL

PROTECTION OF POTABLE WATER SYSTEMS

On “dual source” sites where both potable water and recycled water are present, the potable supply must be protected against accidental cross-connections. In lieu of an air-gap, reduced-pressure principal backflow prevention (RP) devices are generally approved by the State DPH, local city or county Health Department and the Recycled Water Agency. This is done according to the approved site-specific drawings. The backflow prevention device must be located at the parcel boundary as close to the meter as possible.

Backflow prevention devices must be approved by the Recycled Water Agency and by the State DPH or local city or county Health Department before installation. If an RP is installed, it must be tested annually by a backflow prevention device tester certified by the ABPA or the AWWA. Test reports must be provided to the Recycled Water Agency and the regulatory agency requiring the test. Records must be maintained for at least three (3) years by both the User and the Recycled Water Agency.

MOW STRIP

A recycled water use site shall have a physical boundary all around its parcel boundary; such as a sidewalk, mow strip, fence-line with concrete base, etc. The use of mow strips to delineate between a recycled water use area and a potable water use area is required if there is no other physical barrier between the two irrigation systems. The mow strips should be a minimum of 4-inches wide and the depth of the mow strip should limit any inadvertent cross-connections.



Concrete "mow strip" separates potable water and recycled water irrigated areas

INITIAL CROSS-CONNECTION TEST

Prior to retrofit work or construction, an initial cross-connection inspection and test must be coordinated by the Recycled Water Agency, with all appropriate health agencies being notified. This test should follow the general guidelines outlined in Section F. The purpose of the test is to determine if there are any connections between the existing irrigation system and the potable water system prior to construction.

During the lifetime of the recycled water system, the Recycled Water Agency must periodically inspect the recycled water system to ensure compliance with all applicable rules and regulations.

Additionally, the Recycled Water Agency may be required to perform periodic inspections of the system for cross-connections (including shut-down tests, if appropriate), depending on the use site characteristics.

FINAL CROSS-CONNECTION TEST

On sites where both recycled and potable water are present, a cross-connection test must be performed using potable water supplied through an approved backflow prevention device before connecting the User's on-site recycled water system to the Recycled Water Agency's distribution system. This on-site test is to ensure the absolute separation of the recycled and potable water systems. The Recycled Water Agency shall coordinate the scheduling of the cross-connection test. Periodic testing using the same procedures may be required in the future, depending on the use site's characteristics. A written report documenting the test results must be submitted to the Recycled Water Agency, the State DPH and the local city or county Health Department following completion.

A pressure (shut down) test procedure is detailed in Section F.

As an alternative to the pressure test, a dye test may be performed by charging the recycled water system with potable water containing a food grade colored dye. The unpressurized potable water system is then checked for any evidence of the colored dye. If the dye is found, a cross-connection exists. This test itself must be done in a way that does not create a cross-connection.

Upon the successful completion of one of the above tests, insuring no cross-

connections between the potable and recycled water systems, the User's irrigation system may be connected by the Recycled Water Agency to the recycled water distribution system.

PERIODIC CROSS-CONNECTION TESTING (PCCT)

Periodic cross-connection shutdown testing must be done at least once every four (4) years for "dual-plumbed" sites, unless visual inspections or major on-site water system changes reveal a need for more frequent testing. The Water Recycling Criteria in Title 22 specifically defines "dual-plumbed" sites as either a) buildings with fixtures served with recycled and potable water or b) individual residences with recycled water in the irrigation system.

Other "dual-source" use sites that don't fall under either of these categories may be required to perform periodic cross-connection tests if the use site characteristics indicate a greater risk of potential cross-connections, or if any reuse site undergoes significant modifications of the potable or recycled water systems. The Recycled Water Agency, in cooperation with the local city or county Health Department, will make the determination if such a test is required.

This test must follow the same procedures use for the final cross-connection test (either shut-down or dye test). Before the test is performed, representatives of the State DPH, the local city or county Health Department, Site Supervisor, Recycled Water Agency and any other required regulatory agency must be notified. The Recycled Water Agency will coordinate the scheduling of the test. A sample Test Notification Form is on page 41.

Written verification of the test results must be provided by the Recycled Water Agency to the Site Supervisor, State DPH, local city or county Health Department, local building authority and any other required regulatory agency. All provisions of Title 17, Chapter 5, Section 7601 of the California Code of Regulations, concerning protection of drinking water systems against cross-connections and backflow, must be strictly complied with.

EMERGENCY CROSS- CONNECTION RESPONSE PLAN

In the event that a backflow incident or cross-connection is suspected or occurs the following procedures must be implemented immediately.

1. Keep the potable water system pressurized.
2. Immediately shut off the recycled water supply to the facility at the meter.
3. If possible, post **“DO NOT DRINK”** signs at all potable water fixtures and outlets.
4. Notify the Recycled Water Agency and the appropriate local city or county Health Department by phone (see list on page 42). This notification is to be followed by a written notice within 24 hours. The written notice is to include an explanation of the nature of the cross-connection, date and time discovered, and the steps taken to mitigate the cross-connection(s).
5. Collect water samples from the potable water system and perform a 24-hour bacteriological analysis (as instructed by the Recycled Water Agency). Water samples should be collected from the closest possible point to the cross-connection.
6. Identify the cause and location(s) of backflow and eliminate the cross-connection(s).
7. Conduct a cross-connection test in coordination with the Recycled Water Agency and the appropriate Health Departments to verify that all cross-connections have been eliminated.
8. Obtain approval from the Recycled Water Agency and the local city or county Health Department before returning the recycled water system to service.
9. If the bacteriological analysis conducted in Step 4 is positive, flush the potable water system and disinfect by maintaining a chlorine residual of at least 50 mg/L for 24 hours. Otherwise proceed to Step 11.
10. Flush the potable water system after 24 hours and perform standard bacteriological analysis.
11. If the results from Step 9 are acceptable, proceed to Step 11. Otherwise, repeat Steps 8-9.
12. Obtain final approval from the Recycled Water Agency and the State, local city or county Health Department before removing signs.

SECTION F USE SITE PRESSURE-TESTING PROCEDURE

The following are general guidelines for the testing procedure and may be modified with the approval of the State DPH and local city or county Health Department.

1. Potable water must be used during the initial testing of the on-site recycled water system, with the potable water supply separated from the proposed recycled water system by an approved RP assembly until the system has been checked for cross-connections.
2. The irrigation (future recycled water) system should be drained and remain deactivated for an adequate period of time based on site-specific characteristics to allow for sufficient depressurization.
3. At the end of the shutdown period, all of the irrigation system outlets should be tested throughout the entire site for cross-connections by checking each outlet for flow. This should be done at the quick couplers (located on the normally pressurized main irrigation line) and by cycling the irrigation clocks (observing the spray decrease) to determine if there is any flow. If there is no flow detected in any of the outlets that would suggest a cross-connection, the connection to the irrigation system may then be reactivated.
4. The potable water to the domestic uses on the site will then be shut off at the potable water meter. The domestic water system must be drained and remain deactivated for an adequate period of time based on site-specific characteristics to allow for sufficient depressurization.
5. At the end of the shutdown period, all of the use site's domestic water fixtures should be tested for cross-connections by operating each fixture and checking for flow. The potable water inlet should then be checked to detect if there is backpressure or significant backflow. If no flow is detected at the inlet or in any of the fixtures that would suggest a cross-connection, the potable water connection may then be reactivated.

SECTION G SAMPLE FORMS AND SITE SPECIFIC DETAILS

SUMMARY OF STEPS TO OBTAIN RECYCLED WATER

NOTE: The following sequence of events is general in nature and is for illustration only. Please check with your Recycled Water Agency for the appropriate process.

Potential User contacts the Recycled Water Agency for recycled water service, and the Agency responds in a timely manner.

Potential User must have irrigation plans stamped by a registered landscape architect or a registered civil engineer.

Potential User submits a recycled water application (an example is shown on page 39) and pays the application fee (if applicable). The User agreement is explained and signed at this time.

The potential User shall apply to the Recycled Water Agency for a recycled water meter. A construction meter for potable water and an appropriate backflow prevention device may be required for temporary water and system testing before being served recycled water.

Recycled Water Agency notifies the State, local city or county Health Department of the submitted application.

Potential User submits two sets of plans each to the Recycled Water Agency and to either State DPH or the local city or county Health Department for plan check, and pays the applicable plan check fees.

Recycled Water Agency, State DPH, and the local city or county Health Department complete plan check and return plans to the potential User for corrections.

After all corrections are made the potential User resubmits the marked plan checked prints along with a final set of plans. If no more corrections are to be made, the Recycled Water Agency, State DPH, and the local city or county Health Department will approve the original plans. Four (4) sets of prints of the signed plans each should be submitted to these agencies.

A pre-job meeting (preliminary inspection) is held before construction with the Recycled Water Agency's representative, potential User and the contractor. This meeting is to cover the plan's general notes, specific job requirements and cover any questions. Following this meeting, an initial cross-connection test is to be conducted on existing systems with the state and/or city or county health agencies.

The potential User may begin construction, according to the approved plans, contingent upon any other required permits or approvals being obtained. Approvals for deviations in the approved plans are to be sought as they occur.

All work during construction must be inspected by the Recycled Water Agency and/or the local city or county Health Department *before* backfilling any buried piping. If any recycled or potable water piping is installed before plan check approval and/or inspection, all or any portion of the piping system may be required to be exposed and corrected as necessary.

After construction is completed, the Recycled Water Agency and either State DPH or the local city or county Health Department must be notified for the final inspection and cross-connection test utilizing potable water supplied through an approved backflow prevention device on dual source sites. The recycled water meter is installed, potable water severed and conversion made to recycled water. During this walk through flow adjustments are made, tagging is inspected, and coverage is checked. A thorough cross-connection test must be conducted at this time to verify that construction was performed correctly. The Recycled Water Agency and/or the local city or county Health Department will generate a punch list of corrections to be made if necessary.

A follow-up walk through will be called for after all corrections from the first walk-through are completed if required. This walk-through will inspect to see that all corrections are complete, including color-coded plans for each controller that are accurate and placed at each controller cabinet. Upon the successful completion of the inspection and cross-connection tests, the User will be granted permission for the normal operation of the system. At this time the Recycled Water Agency's inspector will discuss with the User and the User's Site Supervisor conditions for operation, inspections etc.

LOCAL CONTACTS

SITE:

LOCATION:

SUPERVISOR:

PHONE / EMAIL:

RECYCLED WATER AGENCY CONTACTS

WATER OPERATIONS:

PHONE:

SUPERVISOR:

PHONE:

RECYCLED WATER INSPECTOR:

PHONE:

RECYCLED WATER AGENCY'S ENGINEER:

PHONE:

RECYCLED WATER IRRIGATION
USER APPLICATION

Today's Date: _____
Tract No. _____ Project Name: _____
Location: _____ or Brief Legal Description: _____

Type of Development: _____

Description of proposed uses of recycled water: _____

Expected date to commence recycled water service (Month/Year) _____
Estimated Water Requirements:

	<u>Acres</u>	<u>Average AF/YR</u>	<u>Peak Demand (GPM)</u>
Landscape Irrigation:	_____	_____	_____
Park:	_____	_____	_____
Open Space:	_____	_____	_____
School:	_____	_____	_____

Owner: _____
Address: _____
City: _____
State: _____ Zip: _____
Phone: (____) _____

Engineer: _____
Address: _____
City: _____
State: _____ Zip: _____
Phone: (____) _____

Contact: _____

Contact: _____

RECYCLED WATER - SITE INSPECTION REPORT

Site Name: _____ Owner: _____

Address: _____

Site Supervisor: _____ Company: _____

Phone: _____ Email: _____

AREA INSPECTED	NO	YES
- PIPING -		
Piping properly marked?	_____	_____
Valves etc. properly marked?	_____	_____
Has piping been modified?	_____	_____
If yes, are modifications approved?	_____	_____
Points of connection properly marked?	_____	_____
Piping System "Leak"?	_____	_____
- SIGNING -		
Are all signs properly placed?	_____	_____
Are all signs legible?	_____	_____
Are tags visible and legible?	_____	_____
- BACKFLOW PREVENTION -		
Backflow Prevention Device installed?	_____	_____
Does the device appear damaged?	_____	_____
Is the device leaking?	_____	_____
Is the device unobstructed?	_____	_____
Is Recycled Water being used for its approved purpose?	_____	_____

Comments: _____

Recycled Water Meter Number: _____ Reading: _____

Inspected By
Name/Title: _____ Agency: _____

Signed: _____ Date: _____

CROSS-CONNECTION TEST NOTIFICATION FORM

Test Date: _____ Test Time: _____

Site Name: _____

Site Address: _____

Recycled Water Agency:

Contact Person: _____ Phone: _____

Agencies Notified: California Department of Public Health, Drinking Water Field
Operations Branch

CROSS-CONNECTION NOTIFICATION RSVP FORM

Site Address: _____

Test Date: _____

Agency/Company: _____

Representatives Attending: _____

(Please return to requesting party within 10 days of scheduled test)

SECTION H LOCAL GOVERNING AGENCIES

(Local Recycled Water Agency to insert own name, address, phone number, and modify contact information below for its own service area)

Regional Water Quality Control Board

Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013 (213) 576-6600

Lahontan Region
14440 Civic Drive, Suite 200
Victorville, CA 92392
(760) 241-6583

State of California Department of Public Health

Drinking Water Field Operations Branch
500 N. Central Avenue, Suite 500
Glendale, CA 91203
(818) 551-2016

County of Los Angeles Department of Public Health

Cross-Connection and Water Pollution Control
5050 Commerce Drive Baldwin Park, CA 91706
(626) 430-5290

Long Beach Department of Health and Human Services

Bureau of Environmental Health
2525 Grand Avenue
Long Beach, CA 90815
(562) 570-4095

City of Vernon Health and Environmental Control Department

4305 South Santa Fe Avenue
Vernon, CA 90058
(323) 583-8811

City of Pasadena Public Health Department

1845 North Fair Oaks Avenue
Pasadena, CA 91103
(626) 744-6005

SECTION I DEFINITIONS

Whenever the following terms, or pronouns used in their place, occur in this Manual the intent and meaning shall be interpreted as follows:

Air Gap Separation – A physical break between a water line and a receiving tank or reservoir which is at least double the diameter of the pipeline vertically above the rim of the tank or reservoir, and in no case less than one-inch.

Applicant – An Owner or authorized representative of a potential reuse site who applies for recycled water service under terms of the appropriate regulations. An approved Applicant becomes a User.

Approved Backflow Prevention Assembly – A device installed to protect the potable water supply from contamination by non-potable water and is approved by the State of California.

Approved Use – An application of recycled water in a manner, and for a purpose, designed in a user agreement issued by the Recycled Water Agency and in compliance with all applicable Regulatory Agency requirements.

Approved Use Area – A site with well-defined boundaries, designated in a user agreement issued by the Recycled Water Agency to receive recycled water for an approved use and acknowledged by all applicable Regulatory Agencies.

Chief Executive Officer – The highest-ranking management official of the Recycled Water Agency.

Construction Use – An approved use of recycled water to support approved construction activities, such as soil compaction and dust control during grading.

Cross-Connection – Any physical connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome and potable for human consumption.

Graywater – Untreated domestic wastewater from bathtubs, showers, bathroom wash basins, clothes washing machines, and laundry tubs, but excluding toilets, kitchen sinks, dishwashers, photo development sinks and laundry water from soiled diapers. This is *not* the same as treated recycled water.

Infiltration Rate – The rate at which the soil will accept water as applied during irrigation, expressed in inches per hour.

Inspector – Any person authorized by the Recycled Water Agency or the local health agencies to perform inspections on or off the Users site before construction, during construction, after construction and during operation.

Irrigation Period – The time, from start of water flow to end, which a specific area receives recycled water by direct irrigation application, no matter how often the specific area is irrigated – that is, length of the duty cycle.

Irrigation Use – An approved use of recycled water for landscape irrigation as defined for recycled water under Title 22, Division 4, Chapter 3 of the California Code of Regulations.

Landscape Impoundment – An open body of recycled water on a use site that is utilized for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

Local City or County Health Department – This agency is the local health protection agency for the municipality in question. The four agencies within Los Angeles County are County of Los Angeles and the cities of Long Beach, Vernon and Pasadena.

Non-potable Water – The water that has not been treated for human consumption in conformance with the latest edition of the United States Environmental Protection Agency’s Drinking Water Standards, the California Safe Drinking Water Act, or any other applicable standards. This also refers to irrigation or industrial process water derived from a potable water system through an approved backflow prevention device that may be subject to contamination (for example, through back-siphonage).

Off-site – Designates or relates to recycled water facilities up to and including the water meter that are owned and operated by the Recycled Water Agency.

On-site – Designates or relates to facilities owned and operated by a User.

Operations Personnel – Any employee of a User, whether permanent or temporary, or any contracted worker whose regular or assigned work involves the supervision, operation or maintenance of equipment on any portion of on-site facilities using recycled water.

Operator – Any person, persons or firm, who by entering into an agreement with a User is responsible for operating on-site facilities.

Owner – Any holder of legal title, contract purchaser, or lessee under a lease with an unexpired term of more than one (1) year, for property for which recycled water service has been requested or established.

Point of Connection – This is the point where the User’s system ties to the Recycled Water Agency’s system, usually at the water meter.

Ponding – Unintentional retention of recycled water on the surface of the ground or other natural or manmade surface for a period following the cessation of an approved recycled water use activity such that a hazard or potential hazard to the public health results.

Potable Water – That water that is safe, pure and wholesome, does not endanger the lives or health of human beings and conforms to the latest edition of the California Safe Drinking Water Act, or other applicable standards.

Public – Any person or persons at large who may come in contact with facilities and/or areas where recycled water is approved for use.

Rate and Fee Schedule – The schedule of all rates, charges, fees and assessments to be made concerning the use of recycled water served by the Recycled Water Agency as approved or as amended by the Recycled Water Agency. Note: If the recycled water provided by an investor-owned utility functioning as the Recycled Water Agency, rates and fees are approved or amended by the California Public Utilities Commission.

Recreational Impoundment – An open body of recycled water located on a use site that may be used for unrestricted body contact (swimming, wading) or restricted non-body contact (boating, fishing) recreation.

Recycled Water – Non-potable water that results from a high level of treatment of municipal wastewater and which is approved for purposes other than drinking water through Title 22 of the California Code of Regulations.

Recycled Water Agency – The local purveyor or producer of recycled water for the specified service area (public or private).

Regulatory Agencies – Those public agencies legally constituted to protect the public health and water quality, such as the State Department of Public Health, the California Regional Water Quality Control Board and the local city or county Health Department.

Runoff – Recycled water that is intentionally or incidentally allowed to drain outside the approved recycled water irrigation area.

Service – The furnishing of recycled water to a User through a metered connection to the on-site facilities.

Site Supervisor – A qualified person designated by the User to provide liaison with the Recycled Water Agency. This person should be responsible for the installation, operation and maintenance of the recycled and potable water systems and also prevention of potential hazards should have the knowledge and authority to carry out any requirements of the Recycled Water Agency, and should be available to the Recycled Water Agency at all times.

State Department of Public Health – The State of California Department of Public Health, Drinking Water Field Operations Branch.

Unauthorized Discharge – Any release or spill of recycled water that violates the rules and regulations of the Recycled Water Agency or all applicable Federal, State or local statutes, regulations, ordinances, contracts or other requirements.

User – Any person, persons or organization (including, but not limited to, any private company or corporation, public utility, municipality or other public body or institution) issued a recycled water Users' Permit by the Recycled Water Agency. The User and Owner may be the same entity.

User Agreement – An agreement issued by the Recycled Water Agency to a recycled water service Applicant after the satisfactory completion of the service application procedures. This Agreement forms a service agreement between the User and the Recycled Water Agency that legally binds the User to all conditions stated in the Agreement and all applicable Regulatory Agency requirements.

User Agreement (For Users Served by an Investor-Owned Utility) – An agreement shall consist of the signed Application, the User Manual, a copy of the applicable Regional Board water recycling permit and the CPUC approved Tariff Schedules. These form a service agreement between the User and the Recycled Water Agency that legally binds the User to all conditions stated in the Agreement and all applicable Regulatory Agency requirements.

Violation – Noncompliance with any condition or conditions of the User Agreement, water recycling requirements issued the Regional Board and/or Title 22 of the California Code of Regulations by any person, action or occurrence, whether willfully or by accident.

Windblown Spray – Dispersed, airborne particles of recycled water that can be transmitted through the air to locations other than those approved for the direct use of recycled water.

SECTION J TIPS FOR SUCCESSFUL RECYCLED WATER USE

Recycled water that is delivered for beneficial reuse has been “manufactured” at a water reclamation plant, resulting in a quality that meets very strict State DPH standards for safety. It is virtually impossible to distinguish the recycled water, as described in this Manual, from potable water. However, there are general chemical differences that may require Users to make changes in their landscaping practices. The following few pages is not meant to be a comprehensive discussion of issues that might arise when irrigating with recycled water; but, rather, the more common areas of concern.

SALT LEVELS

Salt is a difficult and expensive constituent to remove from water; consequently, it and other minerals that are not often removed by conventional treatment processes. The salinity, or salt levels, in recycled water can vary from treatment plant to treatment plant, but are generally higher than the local domestic water supply. Therefore, Users may want to carefully consider their selection of plants, soil composition and irrigation practices.

Type of Plants

For the most part, turf grass is very tolerant of higher salt levels (see table, page 48), as are many ornamental trees and shrubs. Additionally, experience has shown that most flowering plants thrive with the use of recycled water.

However, not all landscape plants are suitable for irrigation with recycled water. Several varieties are very salt **intolerant** and should be avoided when using recycled water.

Soil Types

The type of soil present at a User’s site strongly influences how the salt in the recycled (or any) water affects plant growth and health. Well-draining soil is preferable; however, many areas have a significant clay component in their soil. Clay tends to hold on to salt, and can actually cause the soil to stop draining altogether. This particular phenomenon is the direct result of elevated levels of sodium and is measured by its ratio to calcium and magnesium (Sodium Adsorption Ratio, or SAR). The presence of self-regenerating water softeners that discharge sodium-laden brine into the sewer system can be large contributors to elevated sodium levels in the recycled water.

Problems with soil drainage due to clay soils and an elevated SAR can be rectified by the application of gypsum (calcium), which loosens the bound up clay and allows for water to drain through the soil.

However, when dealing with clay soil drainage issues, some recycled water users have rejected gypsum as it increases the salinity, opting instead for an acid injection system. Buffered acid can be added to break up the bicarbonate binding and salt buildup at the surface level in clay soils and allow improved penetration to the root zone.



Azaleas require acid soil, while recycled water tends to be slightly alkaline

Irrigation Schedule

Many irrigation systems schedule their watering for short periods of time, in some cases almost every night of the week. Salt levels of in the recycled water and the type of soil involved (sand vs. clay) may call for a switch to longer irrigation run times done on a less frequent basis. Short irrigation runs have a tendency to deposit more salt in the root zone, with possible adverse impacts on plant health and growth. Clay soil is more susceptible to this phenomenon than better-draining soils. Heavier watering done less frequently helps to leach the accumulating salts out of the root zone.

This is particularly important in regions of the state that do not experience sufficient precipitation during the rainy season. Rainfall can have the same effect as longer watering periods, if the storms are heavy enough. Periods of drought can exacerbate the build-up of salts but can be addressed with a modified irrigation schedule.

NUTRIENTS

Recycled water may also contain higher nutrient levels such as nitrogen, phosphorous and potassium that are essential components for plant growth. Some treatment processes may reduce the levels of these chemicals, although they are not totally removed.

Fertilizer Value

While nutrient levels vary among treatment plants, there are usually sufficient levels of nitrogen, phosphorous and potassium in the recycled water to provide at least a small measure of fertilizer value to the landscaping each and every time irrigation takes place. Based on nutrient levels in the recycled water being supplied, a Site Supervisor can readily calculate the number of pounds of each constituent being delivered. He or she can then determine how much, if any, and what kind of additional fertilizer needs to be applied.

A common error is to continue the same fertilizer application schedule that was in place when domestic water was being used for irrigation. The addition of applied fertilizer, on top of the extra nutrients in the recycled water, can cause problems with plant health, groundwater quality problems and avoidable costs to the site in buying and using unnecessary fertilizer.

Increased Mowing

Reports from many turf sites using recycled water have reported the need to mow their grass more often. This is the direct result of the additional nutrients in the recycled water being available for uptake by the turf.

Ornamental Lakes

Some use sites have ornamental lakes as part of the landscaping. Care must be exercised if recycled water is used to supply these lakes. The nutrient value in the recycled water readily promotes the growth of algae, which can impair the aesthetics of these lakes. This is particularly a problem in lakes that are shallower than 10 feet, due to excessive sunlight penetration.

Several different strategies have been employed at such lakes, with the greatest level of success in algae control coming from combinations of two or more of the following methods:

- Pumping the recycled water from the lake into the irrigation system reduces the amount of time the water (and the nutrients it contains) spends in the lake, consequently reducing algae production.
- Re-circulating the water by means of fountains or waterfalls or installing more extensive aeration systems.



- Preventing the introduction of organic material (such as grass clippings) from entering the lake.
- Stocking the lake with algae eating fish, such as Mosquito fish (*Gambusia affinis*), which can be provided free by the Greater Los Angeles County Vector Control District, catfish, pleco or carp. However, some fish, like koi, bass and bluegill, react unfavorably to higher ammonia levels that may be in the recycled water.

- Using a chemical tinting product, such as Aqua-Shade, to prevent sunlight from penetrating the water column.
- Using a chemical algaecide, such as copper sulfate. (**Warning:** This product is also toxic to other organisms, so the lake water could not be used for landscape irrigation.)
- Because refilling ornamental lakes may not be a significant consumptive use of the recycled water, in some cases it may be preferable to fill the lakes with potable water or even non-potable well water.

IRRIGATION EQUIPMENT

Because of the different chemical make-up of recycled water and the possible presence of higher levels of chlorine, older irrigation valves and sprinklers may experience operational problems following the switch-over to recycled water. Many irrigation equipment manufacturers now stock equipment especially made for use with recycled water, not only with the proper markings, but also using more resilient materials.

TURFGRASS SPECIES	GRASS TYPE	ET RATE	DROUGHT TOLERANCE	TURFGRASS TOLERANCE TO SOIL SALINITY (ECe)
Annual Bluegrass	CS	Very High	Poor	Sensitive < 3 dSm-l
Colonial Bentgrass	CS	Very High	Poor	
Bluegrass	CS	Very High	Fair	
Annual Ryegrass	CS	Very High	Poor	Moderately Sensitive 3-6 dSm-l
Creeping Bentgrass	CS	Very High	Fair	
Red Fescue	CS	Medium	Fair	
Hard Fescue	CS	Medium	Fair	
Perennial Ryegrass	CS	High	Fair	
Tall Fescue	CS	Very High	Medium	Moderately Tolerant 6-10 dSm-l
Kikuyugrass	WS	High	Good	
Zoysia grass	WS	Low	Excellent	
Creeping Bentgrass 'Seaside'	CS	Very High	Fair	Tolerant >10 dSm-l
Alkaligrass	CS	-	-	
Bermudagrass	WS	Low	Superior	
St. Augustinegrass	WS	Medium	Good	
Seashore paspalum	WS	Medium	Excellent	

Salinity tolerance of various turf grasses

APPENDIX E
TUSD CERTIFICATION FORMS

TOBACCO / ALCOHOL CERTIFICATION

The undersigned Contractor acknowledges that the District has implemented a policy which prohibits the use or consumption of any tobacco or alcoholic product in or on any District owned or leased real or personal property. The Contractor agrees to comply with the District's policy prohibiting use or consumption of tobacco/alcoholic products and agrees that all of its personnel will comply with such policy. The Contractor further agrees to inform all Subcontractors, of any tier, performing any Work at the Site of such policy and that all personnel of any Subcontractor, of any tier, at the Site shall comply with such policy. The Contractor further acknowledges that any person violating such policy shall be subject to immediate removal from the Site and at the sole discretion of the District, such person may be prohibited from any further presence at the Site. The removal of any person or the prohibition of any person to be present at the Site shall not be a basis for adjustment of the Contract Time or the Contract Price.

The undersigned is an authorized employee, agent or representative of the Contractor, the undersigned has read and understood the entirety of the foregoing, the undersigned is authorized to execute this Tobacco/Alcohol Certification on behalf of the Contractor and is authorized to bind the Contractor to the provisions and requirements of this Tobacco/Alcohol Certification.

This Tobacco/Alcohol Certification is executed this _____ day of _____, 20__

at _____
(City and State)

(Contractor Name)

(Signature of Contractor's Authorized Agent, Representative or Employee)

(Handwritten or Typed Name of Contractor's Authorized Agent, Representative or Employee)

DRUG-FREE WORKPLACE CERTIFICATION

I, _____, am the _____ of _____
(Print Name) (Title)
_____. I declare and state the following:
(Contractor Name)

- 1. I am aware of the provisions and requirements of California Government Code §§8350 et seq., the Drug-Free Workplace Act of 1990.
- 2. I am authorized to certify, and do certify, on behalf of the above-name Contractor that a drug free workplace will be provided by the Contractor by doing the following:
 - A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in the Contractor's workplace and specifying actions which will be taken against employees in violation of this prohibition.
 - B. Establishing a drug-free awareness program to inform employees about all of the following:
 - i. The dangers of drug abuse in the workplace;
 - ii. The Contractor's policy of maintaining a drug-free workplace;
 - iii. The availability of drug counseling, rehabilitation and employee-assistance programs; and
 - iv. The penalties which may be imposed upon employees for drug abuse violations.
 - C. Requiring that each employee engaged in the performance of Work be given a copy of the statement required by sub-division (A) above, and that as a condition of employment by the Contractor in connection with the Work, the employee agrees to abide by the terms of the statement.
- 3. Contractor agrees to fulfill and discharge all of the Contractor's obligations under the terms and requirements of Government Code §8355 by, *inter alia* publishing a statement notifying employees of: (a) the prohibition on any controlled substance in the workplace; (b) establishing a drug-free awareness program; and (c) requiring that each employee engaged in the performance of Work be given a copy of the statement required by Government Code §8355(a) and requiring that the employee agree to abide by the terms of the statement.
- 4. The Contractor and I understand that if the District determines that the Contractor has either: (a) made a false certification herein; or (b) violates this certification by failing to carry out and implement the requirements of Government Code §8355, the Contract is subject to termination, suspension of payments or both. Contractor and I further understand that, should the Contractor violate the terms of the Drug-Free Workplace Act of 1990, the Contractor may be subject to debarment pursuant to Government Code §8350 et seq.
- 5. The Contractor and I certify that the Contractor and I will adhere to, fulfill, satisfy and discharge all of provisions and obligations under the Drug-Free Workplace Act of 1990.

I declare under penalty of perjury under the laws of the State of California that all of the foregoing is true and correct.

Executed at _____, this _____ day of _____, 20____.
(City and State)

(Signature)

**NOTICE TO CONTRACTORS RE:
DEPARTMENT OF JUSTICE (DOJ)
FINGERPRINT RECORDS CHECK**

Contractor agrees to comply with all provisions of Education Code Section 45125.1. The DOJ will conduct a criminal background check of all Contractor and Sub-Contractor employees assigned to provide services for the District. The Contractor will certify that no employees who have been convicted of serious or violent felonies, as notified by the DOJ, will have contact with pupils, as specified by the Education Code. The Contractor will be responsible for all Sub-Contractor employees assigned to the Work and must provide the coordination efforts to comply with the Education Code. At the District's sole discretion, failure to comply with this law may result in termination of this Contract. If the DOJ certification is not received by the District on or before the date specified in the Notice to Proceed, the District will allow the Contractor to delay the start of construction while awaiting clearance from the DOJ. **THERE WILL BE NO EXTENSION OF CONTRACT TIME IF DOJ CERTIFICATION IS NOT RECEIVED PRIOR TO THE COMMENCEMENT DATE.**

EXCEPTION: Pursuant to the District's Standard Operation Procedures, if both of the following listed methods are used, the Contractor's employees need not be fingerprinted: (1) a physical barrier is installed at the Work site to eliminate all contact with students; and (2) the Contractor must assign a supervisor of all the employees who has been fingerprinted and verified not to have committed a serious or violent felony to **continually** supervise and monitor all employees at **all** times.

Note: While the Michelle Montoya School Safety Act requires only one of the above mentioned conditions, the District has adopted the requirement for BOTH. Although accepted by this act, the surveillance or contractor's employees by District personnel is not permitted.

If the exception noted above is not obtainable, the subsequent steps **must** be followed:

Step 1. The Contractor will receive from the District a signed form: Request for Authorization to Receive State Summary Criminal History Information. Contractor must complete this form and mail it directly to the DOJ.

Step 2. Concurrently with Step 1, the Contractor should send their employees and those designated Subcontractor employees assigned to the Work, to a local police department to obtain fingerprint services. This cost will be borne by the Contractor and Subcontractors without adjustment of the Contract Price. The Contractor should take an extra copy of the District's signed Request for Authorization to Receive State Summary Criminal History Information in case the local police department staff requires proof for their service review process.

Step 3. The DOJ will respond directly to the Contractor by sending instructions and a payment form for the Contractor to process. The Contractor will complete these forms and send payment and fingerprint cards directly to the DOJ.

Step 4. The Contractor will receive DOJ clearance of employees. Please note that Education Code Section 45125.1(e)(2) authorizes the DOJ to provide criminal background summaries directly to the public agency where a contractor's employee has been convicted (or has charges pending) of an enumerated offense. Contractor completes a District form: Certification by Contractor of Criminal Records Check AB1620 and AB1612 and submits this Certificate to the District's Purchasing Department. This must be submitted to the District **before** Work may commence.

This entire process may take up to 4 weeks before the Contractor receives DOJ confirmation of criminal background check of employees. Time is of the essence. Contact your local Police department with a District signed Request for Authorization to Receive State Summary Criminal History Information immediately upon notification of award of contract.

DEPARTMENT OF JUSTICE
DIVISION OF CRIMINAL JUSTICE INFORMATION SERVICES

REQUEST FOR AUTHORIZATION TO RECEIVE
STATE SUMMARY CRIMINAL HISTORY INFORMATION
CONTRACT EMPLOYER FOR PUBLIC/PRIVATE SCHOOLS
EDUCATION CODE SECTION 45125.1

Name of Contractor/Company _____

Street Address _____

City _____ State _____ Zip Code _____

Telephone () _____ Fax () _____ Contact Person _____

In accordance with California Education Code Section 45125.1, a school district may require an entity that has an existing contract with a school district to obtain a criminal history clearance. In keeping with the restrictions and requirements set forth in California law, the following are guidelines and restrictions:

On behalf of the agency/organization named above, I hereby acknowledge and agree to the following:

1. The information provided by the Department of Justice (DOJ) to this agency is confidential and shall not be disseminated to any other person or agency not authorized by law (Penal Code Section 11105). A violation of this section is a misdemeanor (Penal Code Section 11105). A violation of this section is a misdemeanor (Penal Code Section 11142).
2. Your agency shall notify DOJ with regard to any change in agency name, address, telephone number or contract person.
3. Fingerprints received will be retained by DOJ per Penal Code Section 11105.2 until notified that the affected individual is no longer employed.
4. Access is granted ONLY to the Contractor (there is NO authority for Subcontractors to gain direct access to DOJ records).
5. Services provided under contract must be performed on school district property.
6. The entity must have a contract (entities in the bid process are not authorized).
7. Original signatures only (no photocopied signatures or faxed forms will be accepted or processed).

Signature _____ Date _____

Printed Name _____ Title _____

PLEASE PROVIDE A SIGNATURE FROM EACH DISTRICT VERIFYING THAT A BACKGROUND CHECK HAS BEEN REQUIRED OF YOUR COMPANY. (You may attach additional letters or signatures as necessary).

School District/County Office of Education
Background Check Requirement Verification

1. _____
Name of Contracting School District

2. _____
Signature of School Official

3. _____
Telephone and Fax Number

In accordance with statutory, regulatory, and constitutional restrictions governing the use and dissemination of criminal offender record information, the above-mentioned Education Code sections allow for exemptions from backgrounding all employees the following conditions:

1. The installation of a physical barrier at the worksite to limit contact with pupils.
2. Continual supervision and monitoring of all employees of the entity by and employee of the entity whom the DOJ has ascertained has not been convicted of a violent or serious felony.
3. Surveillance of employees of the entity by school personnel.

Contractors are not required to comply with the backgrounding requirements set forth in the Michelle Montoya School Safety Act if one or more of the above-mentioned conditions exist.

FOR DEPARTMENT OF JUSTICE USE ONLY

Your request to receive state summary criminal history information pursuant to the Michelle Santoya School Safety Act is approved. Information regarding procedural requirements is enclosed, or will be forwarded under separate cover.

George Renfroe, Manager
Communications Administration Program
Bureau of Criminal Information and Analysis,

Date

AUTHORIZATION RE: CRIMINAL HISTORY - SECTION 00651

CRIMINAL HISTORY AUTHORIZATION 55

**CERTIFICATION BY CONTRACTOR OF
CRIMINAL RECORDS CHECK**

To the Governing Board of Torrance Unified School District:

I, _____, certify that:
(Name of Contractor)

1. I have carefully read and understand the Notice to Contractors regarding DOJ Fingerprint Record Checks ("Notice") (Education Code Section 42125.1).
2. Due to the nature of the Work I will be performing for the District, my employees may have contact with students of the District.
3. The list of employees who will be working on the District's project are as follows:

4. Notice is hereby given that the listed employees have not been convicted of a violent or serious felony, as defined in the Notice and in the Penal Code Section 1192.7. This determination was made by a fingerprint check through the Department of Justice.

I declare under penalty of perjury that the foregoing is true and correct.

Executed at _____, California on _____, (Date)

Signature

Typed or printed name

Title

Street Address

City, State and Zip Code

Telephone(s)

Live Scan Request for TUSD Vendor

School Site/ Department: _____

Vendor Co. Name: _____

Employee Name _____
Last First

_____ Complete Address Phone #

Position Title: _____

Expected Completion Date: _____

Live Scan Payment Source: _____
(\$80)

Authorized Signature: _____
Date

Please attach Board item or other authorizing documentation.

Vendor: Please bring this form along with a photo ID and Social Security Card with you to the District Office to Complete Live Scan Process.

For office use only:

DOJ results received by: _____ FBI results _____
Name/Date Name/Date

Comments: _____

Name of Site administrator informed: _____
Date

ATTN: Diana
Thank You!

Safe and Secure

DOJ & FBI Certified

LIVESCAN and FBI INK CARD FINGERPRINTING

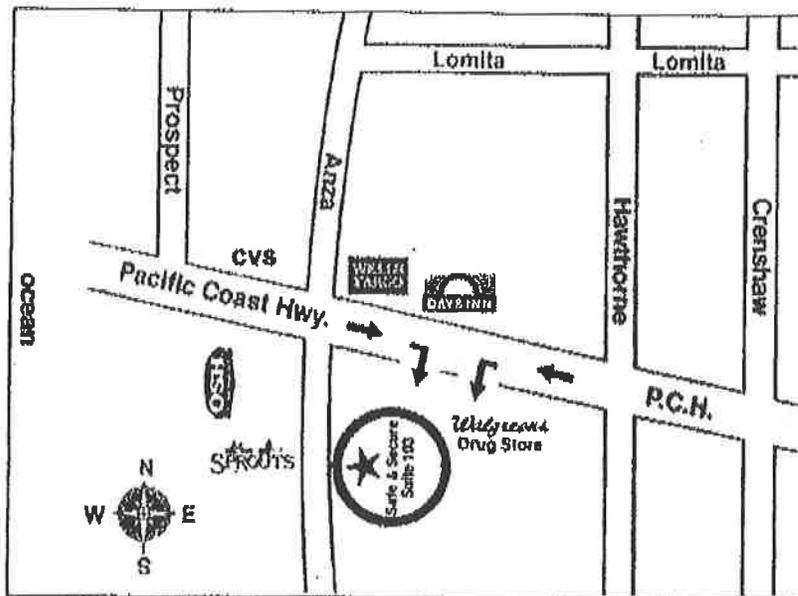
Mon - Fri
Saturday

9:00 a.m. - 6:00 p.m. Walk-Ins
By appointment only



4172 Pacific Coast Highway #103, Torrance, CA 90505

www.SafeSecureUSA.com



Safe & Secure is on the south side of Pacific Coast Hwy between Hawthorne Blvd & Anza Ave.
Safe & Secure office is directly across the parking lot from the entry to Walgreens Drug store.



REQUEST FOR LIVE SCAN SERVICE

Applicant Submission

ORI (Code assigned by DOJ) _____ Authorized Applicant Type _____

Type of License/Certification/Permit OR Working Title (Maximum 30 characters - if assigned by DOJ, use exact title assigned) _____

Contributing Agency Information:

Agency Authorized to Receive Criminal Record Information _____ Mail Code (five-digit code assigned by DOJ) _____

Street Address or P.O. Box _____ Contact Name (mandatory for all school submissions) _____

City _____ State _____ ZIP Code _____ Contact Telephone Number _____

Applicant Information:

Last Name _____ First Name _____ Middle Initial _____ Suffix _____

Other Name (AKA or Alias) Last _____ First _____ Suffix _____

Date of Birth _____ Sex Male Female _____ Driver's License Number _____

Height _____ Weight _____ Eye Color _____ Hair Color _____ Billing Number _____
(Agency Billing Number)

Place of Birth (State or Country) _____ Social Security Number _____ Misc. Number _____
(Other Identification Number)

Home Address Street Address or P.O. Box _____ City _____ State _____ ZIP Code _____

Your Number: _____ Level of Service: DOJ FBI
OCA Number (Agency Identifying Number)

If re-submission, list original ATI number: _____ Original ATI Number _____
(Must provide proof of rejection)

Employer (Additional response for agencies specified by statute):

Employer Name _____ Mail Code (five digit code assigned by DOJ) _____

Street Address or P.O. Box _____

City _____ State _____ ZIP Code _____ Telephone Number (optional) _____

Live Scan Transaction Completed By:

Name of Operator _____ Date _____

Transmitting Agency _____ LSID _____ ATI Number _____ Amount Collected/Billed _____

APPENDIX F
LA COUNTY PUBLIC HEALTH PERMIT



COUNTY OF LOS ANGELES
Public Health

JONATHAN E. FIELDING, M.D., M.P.H.
Director and Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

ANGELO J. BELLOMO, REHS
Director of Environmental Health

TERRI S. WILLIAMS, REHS
Assistant Director of Environmental Health

JACQUELINE TAYLOR, MPA, REHS
Director of Environmental Protection Bureau

Cross Connection & Water Pollution Control Program
5050 Commerce Drive
Baldwin Park, California 91706
TEL (626) 430-5290 • FAX (626) 813-3025

www.publichealth.lacounty.gov

December 12, 2013

**Torrance Unified School District
Maintenance Division
2335 Plaza Del Amo
Torrance, CA 90509**

**Plan Check # 2012114
Site ID # 102101
Water Purveyor: LADWP**

Attention: Phillip Fielding, Director of Maintenance

Subject: Calle Mayor Middle School – Recycled Water Use Site, Baseball fields Irrigation, Conversion, 4800 Calle Mayor, Torrance, CA 90505

Plans prepared by Tetra Tech, Drawings (6): T-1, C-1, C-2, D-1, D-2, D-3.

Ref: State DPH letter dated August 15, 2013 (system no. 1990001) referencing parcel-to-parcel recycled water transmission lines

West Basin letter dated July 10, 2013 referencing parcel-to-parcel transmission lines.

Agreement No. W2176 for recycled water pipeline construction at Calle Mayor MS.

In response to the request for project review, this Department submits the following: The conceptual plans, for the proposed recycled water system serving landscape irrigation to a single field are approved, contingent upon the following for review and evaluation:

1. This review references Calle Mayor Middle School, only. The original submittal, October 16, 2012, included South High School, 4801 Pacific Coast Hwy., Torrance, CA 90505. Plans to convert South High School to recycled water have since been issued a separate plan review; Plan Check# 2013152 and Site ID#102280.
2. Drawing D-2, Plan 1, submit details regarding the flow of water through the new backflow prevention device and the integration with the fire protection system and associated backflow prevention device. Contact both the State Fire Marshall's Office and Division of State Architect Office regarding flow and pressure requirements for the existing fire suppression system with a proposal to install a reduced pressure principle backflow prevention device on the source water. Submit information of both contacts in the re-submittal.



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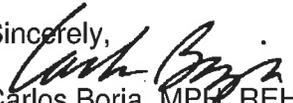
3. Provide details on the backflow prevention device installation for all domestic water meter(s) protection/fire services.
4. The plans call-out a double check valve assembly as the current backflow prevention device serving the landscape irrigation to the campus. Double check valve assemblies with integral air inlet are approved backflow prevention assembly for irrigation systems; verify irrigation backflow assembly. Submit a proposal for a temporary potable water connection protected with an approved backflow prevention device from a dedicated, separate potable water system feeding the new recycled water system to conduct a cross-connection separation test at final and during construction.
5. Plan submittal was on small format drawings. Provide complete construction drawings of the existing irrigation system for the entire campus, prior to the proposed changes.
6. Provide drawings of the irrigation system downstream of the new proposed 2" RPBD, on Sheet, C-2. If the rest of the campus is irrigated from different potable water sources, provide locations and type of backflow prevention devices are or will be installed.
7. All backflow prevention devices and appurtenances shall be inspected by a representative having jurisdiction at school sites. Submit contact information regarding Division of the State Architect (DSA) inspection process.
8. Document the location(s) of all student (Community) gardens and the associated irrigation system.
9. All recycled water quick coupler valves and associated keys shall be of acme thread type design, similar to those already installed at recently converted schools in the District. Submit related cut sheets.
10. All water lines must be identified in an approved manner, distinguishing between: Recycled Water, Do Not Drink – Purple manufactured pipe or approved sleeving; Potable Water – Blue or green tape; Non-Potable Water, Do Not Drink – Yellow tape. Identification tape shall be secured directly to the associated water conveyance pipe, secured every 5 feet or less with black adhesive tape, zip ties are not allowed. Submit samples or photographs of the identification tape or sleeves, recycled water purple pipe for approval.
11. Contact pipe identification suppliers immediately to check availability of the required various pipeline identification tape, sleeves, and tags so as to avoid unnecessary construction delays. Provide samples to this Program for approval.
12. **All Water lines** must be inspected by a representative from the Cross-Connection & Water Pollution Control Program of this Department for proper identification and separation requirements prior to back-filling or enclosing in walls to avoid re-excavation or re-exposure of those lines for inspection.
13. Any unauthorized changes to the approved plans or during construction without written approval, from the Cross-Connection & Water Pollution Control Program of this Department, will deem this review and approval void with construction subject to suspension. Re-submission

of plans with a completed application and associated fees will be required for review and approval prior to construction re-commencing.

14. Contact this Program for a representative to attend any pre-construction meeting or for inspections during construction.

Do not connect to any recycled water source until written approval is received from the Cross-Connection & Water Pollution Control Program of this Department. If you have any questions regarding this review or need assistance, please contact John Furuta at (310) 354-2214 or jfuruta@ph.lacounty.gov.

Sincerely,



Carlos Borja, MPH, REHS

Chief Environmental Health Specialist
Cross Connection & Water Pollution Control Program
Department of Public Health, Bureau of Environmental Protection
5050 Commerce Drive, Rm 116
Baldwin Park, Ca 91706
(626) 430-5295 office
(323) 842-9638 cell

- cc: C. Diep, State DPH
J. Furuta, LA Co DPH
D. Bacani, LA Co DPH
M. Hampson, M & O Supervisor, Torrance Unified School District
R. Liu, Division of the State Architect
D. Delsigne, California Water Service Company
F. Molina, Torrance City Water Department
E. Erickson, Regional Water Quality Control Board



COUNTY OF LOS ANGELES
Public Health

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Director and Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

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Cross Connection & Water Pollution Control Program
5050 Commerce Drive
Baldwin Park, California 91706
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www.publichealth.lacounty.gov

December 12, 2013

**Torrance Unified School District
Maintenance Division
2335 Plaza Del Amo
Torrance, CA 90509**

**Plan Check # 2013152
Site ID # 102280
Water Purveyor: LADWP**

Attention: Phillip Fielding, Director of Maintenance

Subject: South High School – Recycled Water Use Site, Baseball fields Irrigation, Conversion, 4801 Pacific Coast Hwy., Torrance, CA 90505
Plans prepared by Tetra Tech, Drawings (6): T-1, C-1, C-2, D-1, D-2.

Ref: State DPH letter dated August 15, 2013 (system no. 1990001) referencing parcel-to-parcel recycled water transmission lines

West Basin letter dated July 10, 2013 referencing parcel-to-parcel transmission lines.

Agreement No. W2176 for recycled water pipeline construction at Calle Mayor MS.

In response to the request for project review, this Department submits the following: The conceptual plans, for the proposed recycled water system serving landscape irrigation to a single field are approved as submitted, contingent upon the following for review and evaluation:

1. This review references South High School, only. The original submittal, October 16, 2012, was included with Calle Mayor Middle School, 4800 Calle Mayor, Torrance, CA 90505, which has the original issued Plan Check# 2012114 and Site ID#102101.
2. Synthetic athletic field shall remain on a dedicated potable water source protected by a dedicated backflow prevention device.
3. Drawing D-2, Plan 1, submit details regarding the flow of water through the new backflow prevention device and the integration with the fire protection system and associated backflow prevention device. Contact both the State Fire Marshall's Office and Division of State Architect Office regarding flow and pressure requirements of an existing fire



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suppression system with a proposal to install and reduced pressure principle backflow prevention device on the source water. Submit information of both contacts in the re-submittal.

4. The plans call-out a double check valve assembly as the current backflow prevention device serving the landscape irrigation to the campus. Double check valve assemblies with integral air inlet are approved backflow prevention assembly for irrigation systems; verify irrigation backflow assembly. Submit a proposal for a temporary potable water connection protected with an approved backflow prevention device from a dedicated, separate potable water system feeding the new recycled water system to conduct a cross-connection separation test at final and during construction. Provide complete drawings of the existing irrigation system for the entire campus, prior to the proposed changes.
5. Provide drawings of the irrigation system downstream of the new proposed 2" RPBD, on Sheet, C-2. If the rest of the campus is irrigated from different potable water sources, provide locations and type of backflow prevention devices are or will be installed.
6. Plan submittal was on small format drawings. Provide complete construction drawings of the existing irrigation system for the entire campus, prior to the proposed changes.
7. Provide backflow prevention device details for the domestic water meter protection.
8. All backflow prevention devices and appurtenances shall be inspected by a representative having jurisdiction at school sites. Submit contact information regarding Division of the State Architect (DSA) inspection process.
9. Document the location(s) of all student (Community) gardens and the associated irrigation system, recycled water is not allowed for use in community gardens.
10. All recycled water quick coupler valves and associated keys shall be of acme thread type design, similar to those already installed at recently converted schools in the District. Submit information. Standard, single lug quick coupler valves and associated key shall be used for non-potable water systems.
11. All water lines must be identified in an approved manner, distinguishing between: Recycled Water, Do Not Drink – Purple manufactured pipe or approved sleeving; Potable Water – Blue or green tape; Non-Potable Water, Do Not Drink – Yellow tape. Identification tape shall be secured directly to the associated water conveyance pipe, secured every 5 feet or less with black adhesive tape, zip ties are not allowed. Submit samples or photographs of the identification tape or sleeves, recycled water purple pipe for approval.
12. Contact pipe identification suppliers immediately to check availability of the required various pipeline identification tape, sleeves, and tags so as to avoid unnecessary construction delays. Provide samples to this Program for approval.
13. **All Water lines** must be inspected by a representative from the Cross-Connection & Water Pollution Control Program of this Department for proper identification and separation requirements prior to back-filling or enclosing in walls to avoid re-excavation or re-exposure of those lines for inspection.

Do not connect to any recycled water source until written approval is received from the Cross-Connection & Water Pollution Control Program of this Department. Any unauthorized changes to the approved plans or during construction without written approval, from the Cross-Connection & Water Pollution Control Program of this Department, will deem this review and approval void with construction subject to suspension. Re-submission of plans with a completed application and associated fees will be required for review and approval prior to construction re-commencing.

Contact this Program for a representative to attend any pre-construction meeting or for inspections during construction. If you have any questions regarding this review or need assistance, please contact John Furuta at (310) 354-2214 or jfuruta@ph.lacounty.gov.

Sincerely,



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