

**DISTRICT STANDARDS FOR THE
FURNISHING OF MATERIALS AND
CONSTRUCTION OF
WATER AND RECYCLED WATER FACILITIES
AND
PREPARATION OF WATER SYSTEM PLANS**

**BEAUMONT CHERRY VALLEY WATER DISTRICT
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REGISTERED ENGINEER'S STAMP

District Standards for the
Furnishing of Materials and
Construction of Water and Recycled Water Facilities
And
Preparation of Water System Plans

Dated
January 2011

These specifications have been prepared by or under the direction of the following
registered engineer.



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SECTION 1

GENERAL REQUIREMENTS

1-01 GENERAL

The applicant shall furnish all materials, provide all construction, and shall bear engineering, permit, fees and all other costs necessary for the complete installation of the water system as shown on the Water System Construction Plans as well as other District approved drawings or plans and as required in the "District Standards for the Furnishing of Materials and the Construction of Water and Recycled Water Facilities" and "District Standards for Preparation of Water System Plans" together with any District required or authorized changes to those documents.

It is the sole responsibility of the Contractor to contact Underground Service Alert of Southern California (U.S.A. at 811/ 1-800-227-2600) for the locations of underground utilities. The contractor shall perform in compliance with all State and Local safety requirements, including, but not limited to CAL-OSHA requirements. All construction shall be provided by a licensed contractor.

1-02 DEFINITIONS

The word "District" shall mean the Beaumont Cherry Valley Water District.

The word "Board" or words "Board of Directors" shall mean the Board of Directors of the District.

The words "District Engineer" shall mean a civil engineer registered as such in the State of California appointed by the Board acting either directly or through his properly authorized agents, assistants, inspectors and superintendents.

The word "Contractor" shall mean the person, persons, partnership or corporation duly licensed as such in the State of California to enter into a contract for the performance of the work required.

The word "Applicant" used herein shall mean the person or persons and the duly authorized representatives of the party or parties requesting or making an extension or an addition to the District's water system.

The word "Plates" shall mean collectively all of the District Standard Plates attached to and accompanying District Standards and made a part hereof.

The word "Plans" shall refer to the Water System Construction Plans that have been prepared by the District or the Applicant's Engineer and approved by the District.

1-03 CONDITIONS

On all questions relating to the acceptability of the material, machinery or plant equipment, classification of material or work, the proper execution, progress or sequence of the work, quantities and the interpretation of the specifications or drawings, the decision of the District shall be final and binding.

The Applicant shall obtain copies of and comply with all applicable current statutes, laws, ordinances, rules, regulations and specifications of the United States Government, the State of California, the County of Riverside, the city of Beaumont and any other governmental agencies having jurisdiction and shall make application for all required permits and bear the cost of same.

The Applicant shall furnish to the District, copies of all required permits and licenses prior to initiation of the work. Upon completion of the work, the Applicant shall supply to the District, a letter of approval from the governing body having jurisdiction that the Contractor has met the requirements and conditions of the permits of licenses.

1-04 SUPERVISION AND INSPECTION

The District shall decide within the provisions of the specifications all questions which may arise concerning the quality or acceptance of materials furnished and work performed. Contractor shall notify District by preceding Wednesday at 4:00 p.m. prior to working during the weekend. Cancellations shall be notified to the District by preceding Friday at 3:00 p.m.

1-05 DEFECTIVE WORK OR MATERIALS

No work, which is defective in its construction or deficient in any of the requirements of these specifications, will be considered as accepted in consequence of the failure of any inspector connected with the work to point out said defects or deficiency during construction. The Applicant shall correct any imperfect work, without compensation from the District, before final acceptance of the work by the District.

All materials not conforming to the requirements of these specifications shall be considered as defective. They shall be rejected, whether in place or not, and shall be removed immediately from the site of the work by the Applicant at his expense. No rejected material, the defects of which have been subsequently corrected, shall be used until approval in writing has been given by the District.

1-06 MAINTENANCE OF EXISTING IMPROVEMENTS

Unless otherwise indicated in the Plans or in District Standards, or unless otherwise cared for by the owner of a public utility or franchise, all water, gas, oil or irrigation lines, structures or house laterals in place, and other surface or subsurface structures or lines, shall be maintained and shall not be disturbed, disconnected or damaged during the progress of the work. All expense, of whatever nature arising from such disturbance or in the replacement or repair thereof, shall be borne by the Applicant.

1-07 STANDARDS

Standards or reference specification documents incorporated herein by reference shall be those in effect on the day that the District issues the permit to construct.

1-08 GEOTECHNICAL INVESTIGATION

The Applicant shall submit, for District review, a geotechnical investigation report for the project. A soil corrosivity report shall be included as part of the geotechnical report. The corrosivity report shall include laboratory test results of the soils' corrosion potential. Laboratory test shall include: resistivity (ohm-cm), pH, redox potential, sulfides, chloride, and moisture content.

1-09 GEOGRAPHIC INFORMATION SYSTEM (GIS) STANDARDS

Prior to final acceptance of the work, the Applicant shall submit for review and approval all required GIS requirements detailed in Appendix A at the end of this standard specification. See Section 7-08, Plan Approval, for additional requirements. The original mylar record drawings shall be forwarded to the District. All record plans and drawings shall be submitted electronically in PDF format as part of the GIS requirements.

1-10 TRACT MAPS

Applicant shall also submit parcel and street centerline data for all lots within the boundaries of the project in ESRI Shapefile format. The parcel data must include lot numbers and addresses. The street centerline data must include the official name of the street. Detailed requirements are outlined in Appendix A.

1-11 ABBREIVATIONS

ASTM – American Society for Testing and Materials.

AWWA – American Water Works Association.

CDPH/DWP – California Department of Public Health / Drinking Water Program.

NPDES – National Pollutant Discharge Elimination System

RWQCB – Regional Water Quality Control Board.

SWPPP – Storm Water Pollution Prevention Program.

SECTION 2

MATERIALS

2-01 GENERAL

Furnish new and unused ductile iron pipe for all mains, drains, blowoff piping and fire hydrant laterals, unless indicated otherwise.

All brass fittings shall conform to the amended California Assembly Bill 1953 lead free requirements.

2-02 CLASS OF MATERIAL

All material shall be of domestic origin, and be suitable for a working pressure of 150 pounds per square inch (psi), unless otherwise specified or BCVWD approved equal.

2-03 STEEL PIPE

Steel pipe and fittings 4-inch diameter and larger shall be lined and coated with cement mortar. Pipe joints shall be bell and spigot "O" ring or welded joints. Steel sheets shall meet the requirements of ASTM A507 with a minimum yield of 33,000 psi. Flanged joints shall only be installed at valves or fittings or as shown on the drawings. Applicable sections of the following standards apply:

<u>STANDARD</u>	<u>ITEM</u>
ASTM A536	Standard Specification for Ductile Iron Castings
AWWA C200	Steel Water Pipe-6 inch. and Larger
AWWA C205	Cement-Mortar Lining and Coating
AWWA C206	Field Welding
AWWA C207	Steel Pipe Flanges
AWWA C208	Steel Pipe Fittings

All materials shall be suitable for 150 psi working pressure unless specified otherwise. The outside diameter and wall thickness of pipe shall be as follows:

<u>SIZE</u>	<u>PIPE DIAMETER</u>	<u>THICKNESS</u>
4	4 ½" O.D.	10 GA
6	6 5/8" O.D.	10 GA
8	8 5/8" O.D.	10 GA
10	10 3/4" O.D.	0.25 inch
12	12 3/4" O.D.	0.25 inch
16	17" O.D.	0.25 inch

2-04 DUCTILE IRON PIPE (DIP)

Ductile iron pipe and fittings shall be cement mortar lined. Pipe joints shall be mechanical joint or push-on type. Applicable sections of the following standards apply.

<u>STANDARD</u>	<u>ITEM</u>
AWWA C151	Ductile Iron Pipe
AWWA C104	Cement-Mortar Lining for DIP
AWWA C110	Fittings
AWWA C111	Rubber Gasket Joints

Ductile iron pipe and fittings shall be minimum pressure Class 150, unless indicated otherwise on the Plans. The acceptable sizes of pipe shall be as follows:

PIPE SIZE (INCHES)

Inside Diameter

4*

6**

8

10

12

16

18

20

24

30

*4-inch pipe shall only be used for services, air/vacuum assemblies, and blowoffs.

**6-inch pipe shall only be used for services, air/vacuum assemblies, blowoffs, and fire hydrants.

2-05 GATE VALVES

Gate valves 2 inches through 12 inches shall conform to all requirements of AWWA C509, Resilient-Seated Gate Valves. Valves shall be with "O" ring stem seals, opening counter clockwise as manufactured by Mueller Model A-2360 or BCVWD approved equal. Gate valves shall be fusion bonded epoxy coated, 10 -12 mils, per AWWA C550. Epoxy coating shall be NSF 61 approved for potable water.

Gate valves less than 2 inches in size shall be non-rising stem, with wedge discs and threaded ends as manufactured by Ohio Brass working class 250 psi, or BCVWD approved equal.

Gate valves 4 inches through 12 inches shall be flanged. 2 inch gate valves shall be threaded.

2-06 BUTTERFLY VALVES

Butterfly valves 16 inches and larger shall conform to all requirements of AWWA C504, Rubber-Seated Butterfly Valves. Valves shall be manufactured by Mueller Linesal III, DeZURIK, Model BAW or BCVWD approved equal. Butterfly valves shall be fusion bonded epoxy coated, 10-12 mils, per AWWA C550. Epoxy coating shall be NSF 61 approved for potable water.

2-07 VALVE BOXES AND COVERS

Protection boxes and covers shall be furnished and installed with all buried valves. Valve can bottom material shall be 8" SDR-35 PVC pipe. Slip can top material shall have a minimum diameter of 8 inches and be made of 10-gauge galvanized steel 12" in length. Valve can covers shall be 8" round with the applicable word "WATER" or "RECYCLED" cast on each.

Valve extensions shall be "Fiberplas" by Pipeline Products or District approved equivalent.

2-08 FIRE HYDRANTS

Fire hydrants shall have one 4-inch pumper outlet and two 2-½ inch hose outlets. Location and spacing of fire hydrants shall be approved by the fire chief or fire marshal having jurisdiction.

Fire hydrants shall be of the wet-barrel type in accordance with AWWA. Fire hydrants shall be furnished with outlet threads conforming to local Fire Marshall's requirements. Valves shall open to the left or counter-clockwise; operating nut shall be 1-½ inch National Standard pentagon. Hydrant outlets shall be furnished with suitable plastic

caps. Hydrants shall be painted chrome yellow with good quality industrial enamel. All fire hydrant tops shall be painted with the appropriate capacity-indicating color scheme as follows:

- a. Class AA-light blue for hydrants with a flow capacity of more than 1,500 gpm at 20 psi residual pressure.
- b. Class A-green for hydrants with a flow capacity of 1,000 gpm to 1,499 gpm at 20 psi residual pressure.
- c. Class B-orange for hydrants with a flow capacity of 500 gpm to 999 gpm at 20 psi residual pressure.
- d. Class C-red for hydrants with a flow capacity of less than 500 gpm at 20 psi residual pressure.

Nozzle caps shall be plastic with integral color consistent with the appropriate capacity-indicating color scheme.

Hydrants shall be as follows unless otherwise approved by the District.

<u>HYDRANT TYPE (WET-BARREL)</u>	<u>MANUFACTURER AND MODEL</u>
6" X 4" X 2-1/2" X 2-1/2"	Jones 3765

2-09 BLOWOFF HYDRANT

The hydrant on the 4-inch blow-off assembly shall be a Model J-344HP by James Jones Company with a 4-inch inlet and 2-½ inch fire hose connection outlet, or BCVWD approved equal. 6-inch and 8-inch blow-off assemblies shall be installed in accordance with details shown on District Standard Plates No. 3-1 and 3-2. Blow-off shall be sized as follows.

<u>MAIN SIZE</u>	<u>REQUIRED BLOWOFF SIZE</u>
4-inch to 12-inch	4-inch
16-inch to 24-inch	6-inch
30-inch	8-inch

2-10 COMBINATION AIR AND VACUUM VALVE

The combination air and vacuum valve shall be designed to permit automatic escape of large quantities of air from the pipeline when line is being filled and permit air to enter the pipeline when line is being emptied.

It shall also allow accumulating air to escape while the line is in operation under pressure. Valves shall be APCO "Heavy Duty" combination Air Release Valves No. 145C (2"), 149C (4"), 150C (6"), or Crispen Model # AL81/PL10 (8") depending upon size specified on the Plans. Valve shall be sized to suite pipeline size.

<u>MAIN SIZE</u>	<u>REQUIRED VALVE SIZE</u>
4-inch to 12-inch	2-inch
16-inch to 18-inch	4-inch
24-inch	6-inch
30-inch	8-inch

Air and vacuum valve enclosure for 4" diameter and smaller shall be Pipeline Products Polyethylene Valve Enclosure No. VCAS-1830. Provide galvanized steel enclosure for 6" diameter air and vacuum valves. See District Standard Plate 5-2.

2-11 STEEL FLANGES

Steel flanges shall be AWWA C207, Class D, ring type or blind type as required, sizes shown on BCVWD approved plans.

2-12 NUTS, BOLTS AND GASKETS

Gaskets for flanged joints shall be ring type cloth inserted 1/16 inch thick for pipe 10 inches and smaller and 1/8 inch for larger pipe. Asbestos inserted gaskets shall not be used. Gaskets shall be Johns-Manville type 60 or Crane "Cranite" and shall conform to applicable requirements or AWWA C207.

Flange bolts shall be T-316 stainless steel conforming to the requirements of ASTM A193, Grade B8M, standard heavy hexagon head. Nuts shall be T-316 stainless steel, conforming to the requirements of ASTM A194, Grade 8M, standard heavy hexagon. Fit shall be Class 2A or 2B, per ANSI B1.1. Washers shall be of the same material as the nuts.

2-13 FLEXIBLE COUPLINGS

Flexible couplings, when approved by the District, shall be in accordance with AWWA C219 and shall be fusion bonded epoxy coated, steel sleeve and follower rings, or BCVWD approved equal. Hardware shall be 316 stainless steel. Romac 501 Style. Fusion bonded epoxy coating shall be NSF 61 approved for potable water.

2-14 FLANGED COUPLING ADAPTORS (FCA)

Flanged coupling adaptors between flanged fittings and ductile iron pipe shall be Rockwell 912 Cast FCA or BCVWD approved equal. For steel pipe, use Rockwell 913 Steel FCA, or BCVWD approved equal. Hardware shall be 316 stainless steel. Fusion epoxy coating shall be NSF 61 approved for potable water.

2-15 CONNECTION WITH EXISTING SYSTEM

All materials necessary to make connections between proposed and existing water systems per details shown on the Plans shall be furnished and installed by the Applicant and shall be of the size and class shown on the accompanying Plans. Items indicated to be salvaged on the Plans, but not used on this project shall become the property of the District. Connection to the existing system shall not be made until pipelines have been hydrotested, disinfected, and BCVWD approved equal.

2-16 STEEL CASING FOR BORED CROSSINGS

Steel pipe for casing shall be a minimum one-quarter (1/4) inch thick wall for 12 inch to 20 inch nominal diameters and a minimum three eighths (3/8) inch thick wall for pipe sizes up to 36 inch nominal diameter or in accordance with the requirements of the governing agency whichever is greater, and shall be manufactured in accordance with American Water Works Association (AWWA) Standard C200 "AWWA Standard for Steel Water Pipe, 6 in. and Larger", 33,000 psi minimum yield point steel. The casing shall be round and straight, free from protruding bolts, rivets or welds, and shall have an inside diameter of not less than the maximum diameter of the carrier pipe plus 6 inches.

The ends of the Steel Casing Pipe to be jacked or bored into place shall be prepared to withstand pressures developed by jacking the pipe into place. Casing pipe thickness, length and other features shall be as required by the governing utility or agency. The carrier pipe shall have restrained joints for ductile iron pipe and welded joints for steel pipe.

2-17 CONCRETE

Portland Cement concrete shall conform to ASTM Standard Specification C94 entitled "Ready-Mixed Concrete" and shall have a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

2-18 SERVICE SADDLES

Service saddles shall be Romac 101U single flat strap, for 1" services, mains 12" diameter and smaller, and pressures less than 100 psi, Smith-Blair 311, or BCVWD approved equal. For 2" services and mains larger than 12" diameter, and/or pressures greater than 100 psi, saddles shall be Romac 202U double flat strap, Smith-Blair 313 or BCVWD approved equal. Service saddle body shall be ductile iron. Saddle body shall be epoxy coated with zinc plated steel flat U bolts up to 12" and stainless steel straps for larger than 12" in diameter. Service saddles shall be installed no closer than 18" from fittings, joints, and other service saddles.

2-19 CORPORATION STOPS

Corporation stops shall be bronze body, James Co. J-41, or BCVWD approved equal, with iron pipe inlet and outlet.

2-20 TAPPING SLEEVES

Tapping a pipeline with anything above a 2" diameter tap shall not be permitted unless the District has given special consent. If the District has approved the use of a tapping sleeve then Romac SST or BCVWD approved equal shall be used.

2-21 INSULATION FITTINGS

Insulation couplings, flanges, fittings, and unions shall be the products of F.H. Maloney Company, Cor Ban Products Company, or BCVWD approved equal.

2-22 CONCRETE VAULTS

Vaults are to be furnished with one or two 3/8" steel floor plate covers with spring assistance to District specifications.

The No. 700 and 800 series Brooks sectional vaults, as manufactured by Brooks Products Inc., or BCVWD approved equal, are to be used.

2-23 RESTRAINED JOINTS

Restrained joints as called out in plans shall be: megalugs, as manufactured by Ebba Iron Inc., U.S. Pipe, "Field-Lok 350" gaskets, McWane, "Sure Stop 350" gaskets or BCVWD approved equal.

2-01 BACKFLOW PREVENTION DEVICE

Backflow devices shall be reduced pressure principle type (RP) in accordance with AWWA C506 and with the USC Foundation for Cross-Connection Control and Hydraulic Research. RP devices greater than 10" in diameter are not approved.

Backflow devices on fire services shall be reduced pressure principle detector assembly type (RPDA) in accordance with AWWA C506 and with the USC Foundation for Cross-Connection Control and Hydraulic Research. RPDA devices greater than 10" in diameter are not approved. If a larger diameter is necessary, a manifold with 2 RPDA's shall be required.

2-02 FITTINGS

All fittings connected to valves shall be flanged.

SECTION 3

EXCAVATION, TRENCHING AND BACKFILL

3-01 GENERAL

The work covered by this portion of the District Standards consists of the furnishing of all plant, labor, equipment, appliances, and materials and the performance of all operations in connection with excavation, trenching, and backfilling for water mains and appurtenant structures, in strict accordance with the Standards and the applicable drawings.

In case of conflict in requirements for excavation, trenching and backfilling between District Standards and any statutes, laws, ordinances, rules, regulations and specifications of any political subdivision or agency having jurisdiction, it shall be understood that the more exacting requirements shall govern. In general, easements and the aforementioned statutes, laws, ordinances, rules regulations and specifications of any political subdivision or agency having jurisdiction will apply within the political boundaries or public rights-of way to which they apply.

3-02 EXCAVATION

Perform all excavation of every description and of whatever substances encountered, to the depths and alignment indicated on the construction drawings or as otherwise specified. During excavation, material suitable for backfilling shall be piled in an orderly manner, a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins in accordance with CAL-OSHA requirements. All excavated materials not required or suitable for backfill shall be removed at the direction of the District.

Such grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations. Remove, by pumping or other means approved by the District, any water accumulated in the trench from any source.

Suitable shoring, timbering or sheeting shall be provided where necessary to support the sides of the trench prior to and during the installation of the pipe. The shoring methods and procedure shall be consistent with State and Local safety guidelines, including, but not limited to CAL-OSHA, Title 8 requirements.

Unless otherwise indicated, excavation shall be by open cut except that short sections of a trench may be tunneled if, in the opinion of the District, the pipe can be safely and properly installed and backfill can be properly tamped in tunnel sections.

All spoil shall be thrown on one side of the trench only to facilitate distribution and installation of pipe in such a manner that it will not endanger the work and will avoid obstructing roads and driveways. Adequate provisions shall be made for maintaining

the flow of watercourse, drains, sewers or ditches crossing the trench, and upon completion of the work, they shall be restored to their original condition.

The use of trench digging machinery will be permitted except where its operation will cause damage to trees, buildings or existing structures above or below the ground. At such locations, hand methods shall be employed to avoid such damage. Trees, fences, poles and other property shall be protected unless their removal is authorized. Any damaged property shall be satisfactorily restored.

Provide access and proper clearance for installation of pipe in easements. Removal and disposal of all trees, stumps, roots, brush and other objectionable material shall be provided in accordance with the approval of the District.

Minimum cover over the pipe in areas where grade is not shown on the Plans shall be 36 inches for pipe sizes up to and including 12-inch. Minimum cover over the pipe shall be 48 inches for pipe sizes greater than 12-inch. Depth of cover shall be measured from the established street grade or the surface of permanent improvement to the top of the pipe barrel. In the case of lines outside of the existing or proposed street right-of-way, the depth of cover shall be measured from the average natural ground surface. Any deviation shall be subject to approval of the District.

The width of the trench at the top level of the pipe shall be in accordance with the following table:

<u>PIPE SIZE (INCHES)</u>	<u>TRENCH WIDTH (INCHES)</u>	
Inside Diameter	Minimum	Maximum
4*	20	28
6**	22	32
8	24	32
10	26	36
12	30	36
16	34	42
18	42	54
20	44	56
24	48	60
30	54	66

*4-inch pipe shall only be used for services, air/vacuum assemblies, and blowoffs.

**6-inch pipe shall only be used for services, air/vacuum assemblies, blowoffs, and fire hydrants.

The trench shall be excavated minimum 6 inches below grade. The trench shall be refilled to the proper trench grade with sand backfill material compacted to 90 percent of its maximum density as determined by ASTM D1556.

Excavation behind all fittings requiring thrust blocks shall not be machine dug, but shall be hand dug to keep the trench wall solid and undisturbed.

The Applicant shall, at his own expense, provide his monuments and necessary survey work to indicate at the site of the work the alignment and grade for the pipelines to be laid in accordance with the Plans and such grade shall be uniform. No high or low points in the line shall be permitted, except as shown on the Plans, or to conform to the general grade of the street or contour of the terrain through which the pipe is to be laid. No deviation shall be made from the approved line or grade except with the written consent of the District. In the event a "High Point" is created at locations other than shown on the Plans or as directed by the District, air and vacuum release valves of suitable capacity shall be installed, at no expense to the District, to permit air to be released from or taken into the pipeline at said "High Point." Drain assemblies shall be installed at low points at no expense to the District.

In the event blasting is necessary for excavation, the method and procedure shall conform to State and Local Safety guidelines, including, but not limited to CAL-OSHA, Title 8.

All excavations shall be kept free of water while pipe is being placed. Furnish, install and operate all necessary machinery, appliances and equipment to keep excavation sufficiently free of water from any source during construction of the work to permit proper pipe laying and jointing and dispose of water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public. Where it is necessary to use concrete in conjunction with an excavation, all construction areas will be kept free of water until concrete has been placed and allowed to attain its initial set.

Groundwater control shall be provided at those locations where the groundwater is higher than a plane 1 foot below the bottom of the pipeline.

3-03 BACKFILL

A. General – Backfilling of the trench around the pipe and excavation around appurtenances shall follow the installation as closely as possible. Backfill shall be accomplished in two stages:

- Pipe zone backfill from proper trench grade to 12 inches over the pipe;
- Final backfill from 12 inches over the pipe to the surface.

B. Pipe Zone Backfill – Pipe zone backfill should be accomplished as soon as possible after the pipe has been laid. The backfill material shall be imported sand with a minimum S.E. equal to 30 and shall be approved by the District. The material shall be sufficiently damp to permit thorough compaction on all sides of the pipe free from voids. Pipe zone backfill shall consist of placing the backfill from

proper trench grade to an elevation of 12 inches over the top of pipe by the following procedure:

The first lift of material shall be uniformly placed on both sides of the pipelines for the full width of the trench and have a maximum loose depth of not more than 6 inches as measured from the trench bottom. Sand jetting will be permitted with prior authorization by the District.

- C. Final Backfill – The balance of backfill shall contain no such smaller dimensions than specified by the governing body having jurisdiction and shall be free from brush or any other perishable or objectionable matter that would prevent proper compaction, consolidation or that might cause subsequent settlement. All of the backfill placed shall be compacted to a minimum dry density of 90 percent of its maximum dry density as determined by Test Method No. California 216 (latest letter designation). Top 12" of backfill shall be compacted to 95 percent of its dry density.

Any deficiency in the quantity of material for backfilling the trenches or for filling depressions caused by settlement shall be supplied by the Applicant. Surplus spoil shall be spread or be hauled away as directed by the District.

Backfill within traveled streets or highways, existing or proposed, shall meet the standards and approval of the agency or proper authority having jurisdiction over same.

Trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, then backfilled and compacted, with the surface restored to the required grade.

Where jetting has been approved by the District, backfill shall be thoroughly consolidated by use of water jets.

3-04 PAVEMENT REPLACEMENT

All pavement removal and replacement shall conform to the standards and specifications of the governing body having jurisdiction, and shall meet with their approval. The Applicant shall be responsible for replacing all necessary pavement, thermal striping, markers, logos, loop detectors, ect. in accordance with the governing agencies' standard specification.

SECTION 4

INSTALLATION

4-01 GENERAL

All foreign matter and dirt shall be removed from the interior of the pipe prior to its installation. Before, lowering, the pipe shall be inspected for defects. Any defective, damaged, or unsound pipe shall be rejected. The entire joint including coupling, machined sections of the pipe and the rubber gasket or ring shall be thoroughly cleaned at the time the joint is made. The entire procedure and method of installation of the pipe and of making the joint shall be done in a workmanlike manner and shall be in strict accordance with the pipe manufacturer's direction and recommendations.

All pipe shall be laid according to the size, class, location and grade shown on the Plans. The faces of all spigot ends and all shoulders in the hubs or sockets must be true and brought into firm contact. Rubber ring locations shall be checked with suitable gages to insure that they are located in the proper position relative to the pipe ends.

When pipe laying is not in progress, the unfinished end of the pipe shall be securely closed with a suitable plug or cover to prevent the entrance of animals or foreign matter into the line.

Take all necessary care and precautions to prevent the pipe from floating due to water entering the trench from any source. The Applicant shall be responsible for damage caused by floating pipe and shall, at his sole expense, restore and replace the pipe to its proper condition, alignment and grade.

Where pipe is laid on a curve or at horizontal or vertical angles in the trench, the maximum deflection at the joint shall not exceed 60 percent of the limitations specified by the pipe manufacturer and each joint shall be adequately blocked to take the thrust until properly backfilled.

4-02 HAULING AND UNLOADING PIPE

During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe, its lining and its coating. No pipe shall be dropped from cars or trucks nor allowed to roll down skids without proper restraining ropes. Each pipe shall rest upon suitable pads, skids, strips or blocks during transportation and while awaiting installation in the field, and shall be securely wedged or tied in place. Padding shall be used on all car stakes, skids and other material to prevent damage to the coating during transportation and handling.

Any pipe which is damaged shall be repaired or replaced to the satisfaction of the District.

When it is necessary to move the pipe longitudinally along the trench it will be done in such a manner as not to injure the pipe or its coating. Pipe shall not be rolled or dragged on the ground.

Where pipe is placed in stockpiles, it shall be neatly piled and blocked with strips between tiers.

4-03 PROTECTION OF WORK AND MATERIALS

Care must be taken to protect and preserve all materials to be used in the laying of the pipe. The pipe shall be handled in such a manner as not to injure its shape. All pipe and materials which, in the opinion of the Field Inspector, have been damaged shall be replaced.

All material shall be safely stored until it has been incorporated in the completed project. All material damaged or broken shall be replaced in exact type and kind. All materials received and not used shall be removed.

4-04 HANDLING OF PIPE AND ACCESSORIES

Pipe and accessories shall be unloaded at the point of delivery, hauled to, and distributed at the site of the project. They shall, at all times, be handled with care to avoid damage. Whether moved by hand, skidways or hoists, material shall not be dropped or bumped against pipe or accessories already on the ground or against any other object on the ground.

In distributing material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

Pipe shall be handled in such a manner as to avoid damage to machined or special ends. When such damage cannot be repaired to the District's satisfaction, they shall be replaced by the Applicant at his expense.

Precautions shall be taken to protect the interiors of pipes, fittings and valves against contamination.

All pipe, fittings and accessories shall be carefully lowered into the trench in a workmanlike manner, using proper tools and equipment. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

4-05 INSTALLATION OF STEEL OR DUCTILE IRON PIPE MAINS

Steel or ductile pipe shall be laid according to size, line and grade designated on the Plans complete with tracer wire taped to the pipe.

Pipe installed under walls shall be installed within an adequate size steel sleeve with the annular space filled with sand and the ends sealed.

Before any steel or ductile pipe is lowered in place, the trench bottom shall be prepared so that each length of steel or ductile pipe shall have a firm and uniform bearing over the length of the barrel. Proper excavation shall be made to receive the bell of each pipe section. All adjustments in line and grade shall be made by scraping away or filling and tamping in under the barrel of the pipe. Wedging or blocking will not be permitted.

Combined horizontal and vertical deflections at any rubber gasket or flexible coupling joint shall not exceed 4° for 12-inch diameter and smaller pipe and 2° for pipe diameters greater than 12 inches, for standard 20' pipe sections or that recommended by the manufacturer. Pipe shall be carefully handled to prevent damage to the lining.

Ductile iron pipe installed in areas where soil corrosion potential is described as "corrosive" detailed in Appendix D or when required by the district shall be installed with polyethylene encasement in accordance with AWWA C105 and recommendations from the Ductile Iron Pipe Research Association (DIPRA). Polyethylene material shall be 8-mil linear low-density (LLD) film. Installation methods shall be in accordance with method A per AWWA C105.

Tracer wire shall be 14-Gauge, insulated (Blue color/potable or Purple color/nonpotable) copper wire. Tracer wire shall be spliced and extended up every valve can in accordance with details shown on District Standard Plates No. 2. Waterproof wire nuts shall be used at all splices and connections.

Rubber ring joints shall be completed in the trench. The ends of the pipe shall be thoroughly cleaned and positioned for joining. A non-toxic vegetable soap solution shall be applied to the inside of the bell, and rubber gasket snapped into the groove on the spigot end.

The ductile iron water mains shall be laid and the work incidental thereto performed in accordance with applicable requirement of AWWA C600 Standard for Installation of Gray and Ductile Cast Iron Water Mains. The minimum length of any straight pipe between two fittings shall be 2 ft.

Pipe will be inspected in the field before and after laying by the District Field Inspector. No backfill will be done until accepted by Inspector.

4-06 FIRE HYDRANT ASSEMBLY INSTALLATION

Fire hydrants shall be installed to the closest side of the roadway at the locations shown on the accompanying Plans in accordance with details shown on District Standard Plates No. 1, as appropriate herein, and positioned to provide complete accessibility and to minimize the possibility of damage from vehicles or injury to pedestrians. The size and type of hydrant shall correspond to the designation shown on the Plans. The entire hydrant assembly shall be plumb. The face of the 4-inch nozzle shall be parallel to the street centerline. The hydrant shall be located so that centerline of the riser or barrel is not less than 18 inches no more than 24 inches to the back of the curb face or back of the sidewalk. Provide 3 feet from the edge of flange to any structure. Fire hydrant shall not be located in concrete.

Provide and install all necessary fire hydrants bury extensions to permit installation of the hydrant assembly to proper grade. Shear bolts are required at hydrant barrel flange even if breakaway spools are used. Shear bolts shall be placed with the head of the bolt facing down. Hollow portion of bolt shall be filled with silicone.

All fire hydrants shall be bagged with burlap or other BCVWD approved material until water system is operational. Bags shall only be removed after water system has been accepted by the District.

Upon completion of the water main and system installation, and after the field tests have been performed, each fire hydrant shall be operated in the presence of the Field Inspector. Operation shall consist of opening the fire hydrant assemblies and allowing water to flow freely from one or more of its outlets. Upon completion of this sequence, the fire hydrants shall be turned off and all protection caps properly placed on each outlet.

4-07 VALVE INSTALLATION

Valves shall be installed at the locations shown on the Plans and shall correspond to the size and type of ends shown on the Plans. All valves shall be equipped with a protection box and cap. Valves shall be installed with valve extensions if valve operating nut is deeper than 5 ft. from the finish ground surface.

The cutting of pipe for inserting into the bells of valves shall be done in a neat and workmanlike manner, using proper tools and equipment.

All valves shall be carefully lowered into the trench in a workmanlike manner, using proper tools and equipment. Under no circumstances shall valves be dropped or dumped into the trench.

Valves shall not be operated without a District representative present. During the course of water main installation, all valves shall be left completely open or completely closed, unless authorized otherwise by the District. Upon completion of the water mains

and all appurtenances, all valves shall be operated through a complete open and closed cycle in the presence of the Field Inspector. After completion of this operational cycle, all valves shall be left in an OPEN position unless directed otherwise by the District.

4-08 PROTECTION BOXES

Protection boxes shall be installed to proper finished grade in rights-of-way of presently unpaved streets and easements. The entire assembly shall be plumb.

When installed in paved areas, the valve box shall be installed with its top at finished grade.

4-09 BLOWOFF ASSEMBLY INSTALLATION

Blowoffs shall be installed at the locations shown on the Plans and in accordance with the detail shown on District Standard Plate No. 3 herein. The entire assembly shall be plumb with nozzles at right angle to the street or as directed by the District.

Blowoffs shall be located to provide complete accessibility and to minimize the possibility of damage from vehicles or injury to pedestrians.

Upon completion of the water main and system installation, each blowoff shall be operated in the presence of the Field Inspector. Operation shall consist of opening the hydrant head on the assembly and allowing water to flow freely from its outlet. Upon completion of this sequence, the blowoff assembly shall be turned off and all protection caps properly placed on the outlet. Blowoffs shall be painted chrome yellow including caps

4-10 DRAIN ASSEMBLY INSTALLATION

Drain assemblies shall be installed at the location indicated on the Plans, at sites selected by the District to be completely accessible and protected from possible damage from vehicles or equipment.

Drains shall be installed in accordance with details shown on District Standard Plate No. 4 herein, in a workmanlike manner and in accordance with accepted water works standards.

Upon completion of the water main and system installations, drains shall be operated by opening and closing the control valve in the presence of the Field Inspector.

4-11 AIR AND VACUUM ASSEMBLY

Air and vacuum assemblies shall be installed at the locations indicated on the Plans at sites adjacent to the roadway or on back lot lines as selected by the District to be completely accessible and protected from possible damage from vehicles or equipment.

The assemblies shall be installed in accordance with details shown on District Standard Plates No. 5-1 and 5-2 herein, in a workmanlike manner and in accordance with accepted water works standards. Pipe joints shall be assembled in a proper manner to assure that they are free of leaks.

4-12 SERVICE STUB INSTALLATION

The Applicant shall install services per District Standard Plate No. 6-1 and No. 12, shall backfill, compact and replace pavement and sidewalk, as well as any damaged curb and gutter. The Applicant shall obtain all necessary excavation and encroachment permits from either the city of Beaumont or the County of Riverside, as applicable.

Damaged pipe shall be replaced at the discretion of the District Inspector. Blow out pipe before any final connections are made to eliminate any dirt or sand that may have entered into the pipe during installation.

Services stubs installed in areas where soil corrosion potential is described as "corrosive" detailed in Appendix D or when required by the district shall be installed with tape wrap from the main to the angle meter stop. Tape wrap shall be 2" wide polyken #930-35, 2" wide CANUSA, WRAPID tape HCA or district approved equal. Tape shall be installed with minimum 50% overlap. Service saddles and corporation stop shall be wrapped with minimum two layers of 8-mil linear low-density (LLD) film with ends taped.

Install proper size saddle clamp on main.

Services larger than 2" shall have manifolds with the appropriate number of 2" meters.

<u>SERVICE SIZE (INCHES)</u>	<u>NUMBER OF 2" METERS IN MANIFOLD</u>
2	1
3	1
4	2
6	4

Provide at least two tie measurements to lot stakes indicating the location of the valve at the end of the service stub for commercial and industrial services. The tie measurements, together with service stub size, shall be recorded on the set of plans furnished for "Record Drawing" purposes.

4-13 CONCRETE ENCASEMENT

A concrete encasement shall be installed at all watercourse crossings, in easements where water mains are to be installed. The entire encasement shall be installed in accordance with the detail shown on District Standard Plate No. 8 herein. The blanket

shall be installed in a manner to completely surround the pipe barrel and provide protection from flood flows and eliminate possible water infiltration. The entire procedure shall be in accordance with the pipe manufacturer's recommendations. All concrete necessary for concrete blanket shall be furnished by the Applicant.

4-14 THRUST BLOCKS

If joints cannot be restrained by other means, concrete thrust blocks shall be installed at all dead ends, tees, elbows, bends, crosses, blowoffs, drains and fire hydrants shown on the Plans. The thrust blocks shall be adequate in size to provide for a working pressure of 150 pounds per square inch on the pipe under consideration. The Applicant shall provide and install concrete and other materials required for thrust blocks.

Thrust blocks shall be constructed of concrete between the fitting of the pipe and the trench wall and shall conform to the dimensions in District Standard Plates No 11-1 and 11-2. Concrete for thrust blocks shall be min. 3000 psi, 28 day compression strength. Thrust block dimensions shown are the minimum required dimensions. Local conditions may dictate larger size thrust blocks. The concrete shall be placed so that it extends to the trench wall in a manner that enables the entire bearing area to be in contact with undisturbed freshly cut material.

Concrete shall be kept behind the bell of the fitting and shall not be permitted to run against the pipe. Concrete shall be kept clear of all bolts on flanged fittings to enable proper future removal of all such bolts.

4-15 FLANGED FITTINGS AND CONNECTIONS

All flanged valves and fittings shall be properly positioned and aligned in the trench in such a manner as to relieve any stress or strain on the connecting pipe or flanged end being fitted with the pipe system resting in its final position and all fittings and valves plumb. Welding, if required, shall be made in the trench bottom, except where otherwise approved by the District.

4-16 FLEXIBLE COUPLINGS WITH TIE DETAILS

Where flexible couplings are installed in steel water lines, the coupling shall be provided with tie rods, per details shown on District Standard Plate No. 9 herein and AWWA Manual M11.

4-17 CORROSION PROTECTION FOR BURIED VALVE BOLTS AND ACCESSORIES

Coat all buried bolts, including T-bolts for ductile iron mechanical joints, with 2 coats of Koppers Bitumastic 505, 15 mils per coat dry film thickness. Upon completion of the coating of the bolts, the flex coupling, valve or flange coupling adaptor shall be wrapped with 1 layer of 8 mil linear low density (LLD) polyethylene with the ends taped.

4-18 CONNECTION WITH EXISTING SYSTEM

Tie-ins or connections to the District's system shall follow the procedure below:

- The Developer/Contractor shall schedule, at least 96 hours in advance, a date and time for making the connection.
- The Developer/Contractor shall notify all water users affected by the shutdown, a minimum of 48 hours prior to the actual shutdown. The Developer/Contractor shall also notify all District customers of water outage, including the estimated duration which shall not exceed 4 hours.
- Upon completion of the connection to the District system, the gate valve installed on the outlet of the connection shall be left in a closed position, unless otherwise authorized by the District. Under no circumstances shall the outlet gate valve be opened without the express consent and approval of the District.
- Hot tapping mains shall not be permitted except for 2" and smaller service lines.

4-19 BAFFLES

When the natural slope outside the traveled roadway or access roads is greater than 15%, baffles shall be installed at the top of the trench. These baffles shall be installed in accordance with details shown on Plate No. 10 and constructed of 2" x 10" or 2" x 12" redwood plank set on edge at the top of trench. The plank shall be two (2) to three (3) feet wider than the trench and shall be held in place by 2" x 4" redwood stakes driven into the natural ground on the downhill side of the baffle. These stakes shall be driven a minimum of 2 feet into solid ground. The top of the baffle shall be set 2 to 3 inches above the surface of the adjacent ground and the trench backfill shall be increased as to be flush with the top of the baffles throughout the area in which they are installed. Baffles shall start at the top of the slope with spacing based on the following schedule:

<u>SLOPE GRADIENT</u>	<u>BAFFLE SPACING</u>
15%	20 feet
20% (5:1)	15 feet
25% (4:1)	12 feet
33% (3:1)	9 feet
50% (2:1)	7 feet
67% (1-1/2:1)	5 feet

Details of baffle installations are shown on District Standard Plate No. 10 herein.

4-20 BORED CROSSINGS

General – The work covered by this paragraph of the District Standards includes all pipe, pipe fittings, casings, special appurtenances, and materials between the stations indicated as bored crossings on the drawings.

Installations – Crossings shall be bored with an earth auger to the line and grade shown on the plans. The maximum allowable variation in line or grade shall be two-tenths (0.20) of a foot in the distance bored. Should voids be created outside the casing pipe, the voids shall be filled as directed by the District or governing agency. The pipe shall be threaded through the casing on redwood or plastic skids strapped to the pipe with stainless steel straps. Extreme care shall be taken not to break any of the connections. Any broken connection shall be replaced. After the pipe is in the casing, the space between the pipe and the casing shall be filled with sand, blown in. Seal the ends with cement grout. Polyethylene pipe wrapping shall extend 2 ft. into casing at each end.

4-21 ELECTRICAL INSULATION JOINTS

Electrical insulation joints shall be provided at all connections between dissimilar metals.

- A. Insulating Joint. An insulating joint shall be installed by the Contractor where shown on the Drawings. Insulating joints shall prevent the flow of electric current across the joint and be of adequate strength to withstand the working water pressure of the adjacent piping. Flange insulation kits shall consist of:
 - 1. Dielectric gaskets: Full-faced, 1/8-inch thickness, phenolic with gaskets on each side, Type "E", PSI LineBacker sealing gasket, or BCVWD approved equal.
 - 2. Insulating stud sleeves for each bolt: High-density polyethylene or spiral wound mylar.
 - 3. Two insulating washers for each bolt: 1/8-inch thick phenolic.
 - 4. Bolts shall conform to ASTM A193, Grade B7, Heavy Hex, stainless steel, Type 316.
 - 5. Nuts shall conform to ASTM A194, Grade 2H, Heavy Hex, stainless steel, Type 316.
 - 6. Steel washers over each insulating washer: 1/8-inch thick hardened stainless steel Type 316, with the same outside diameter as the insulating washer.

One-piece molded acetal resin combination sleeve and washers are acceptable.
Flange Insulation Kit Products: Corrosion Control Products Company, Central Plastics Company, or BCVWD approved equal.

- B. Installation of Insulation Kits. Flange insulation kits shall be installed as follows:

1. Insulating kits shall be verified to be of proper size and type.
 2. Faces of flange pairs shall be cleaned of all dirt, rust or fouling materials which would interfere with a watertight joint or insulating property of the flange kit.
 3. Full-length insulating sleeves and insulating washers and insulating gaskets shall be as required by Paragraph A hereof.
 4. Alignment pins shall be used to properly align the flange and gasket. The manufacturer's recommended bolt tightening sequence shall be followed. Bolt insulation sleeves shall be centered within the insulation washers so that the insulating sleeve is not compressed and cracked.
 5. For buried insulators, the entire flange assembly and all bolts shall be covered with 20 Mils of bitumastic coal tar epoxy.
- C. Testing of Insulating Joint. Contractor shall retain the services of a corrosion engineer or a certified testing lab, registered in the State of California, to check each insulation joint for electrical continuity and potential after installation is completed. Test results at the insulating joint shall be recorded in a notebook which shall be submitted to the District upon completion of the entire pipeline. If a discontinuity should occur, the system shall be repaired and retested at the Contractor's expense.

4-22 FIRE SERVICE METER ASSEMBLY

All commercial fire service meter assemblies shall be installed in accordance with details shown on District Standard Plate No. 7.

4-23 WATER SAMPLING STATION

Where water sampling stations are installed, the sampling station shall be per details shown on District Standard Plate No. 13 herein. Teflon tape shall be used at all threaded connections. No cutting-oil shall be allowed.

SECTION 5

FIELD TESTS

5-01 GENERAL

After the pipe has been laid, backfilled and compacted, the pipe shall be given a pressure and leakage test. Applicant shall submit compaction test reports (field results) prior to pressure testing. Before conducting the field tests, the pipe shall be completely filled with water, and all air shall be expelled from the line. Water to be used to fill the pipelines will be furnished by the District (District jobs only). To ensure safety to existing system, the "Standards for Disinfecting Water Mains," AWWA C-651 shall apply. The Applicant shall provide a backflow protection valve, pumps and other equipment to properly fill the line with water and produce the required pressure for testing. All equipment required to produce pressure tests shall be subject to inspection by the Field Inspector. The required pressures shall be measured at the point of lowest elevation in the line to be tested.

Should any section of pipe fail the field tests, the line shall be repaired and retested by the Applicant until the line passes all field tests.

The acceptance of the water system by the District is subject to the written guarantee of the Applicant that any defects in the pipeline backfill and pavement which may develop within 1 year from the date of acceptance and dedication shall be repaired in accordance with the provisions of Section 6 entitled "Guarantee and Maintenance" herein.

5-02 PRESSURE TESTS

The pressure test shall be performed prior to conducting the leakage tests set forth in Paragraph 5-03 below. The pressure test shall consist of maintaining a pressure of 225 psi retained at the lowest elevation of the test section, unless higher test pressures are indicated on the plans, continuously for a period of at least 2 hours. The entire system, as installed by the Applicant, shall be tested.

5-03 LEAKAGE TESTS

The leakage test shall be conducted after completion of the pressure test prescribed in Paragraph 5-02 above. The test pressure shall be 150 psi (unless higher test pressures are indicated on the plans) and shall be held continuously for at least 2 hours. The leakage shall then be measured by determining the quantity of water required to refill the lines. Regardless of the rate of leakage, all visible leaks shall be repaired.

No pipe installation will be accepted for dedication by the District until the leakage for the section of line tested is less than the rate of leakage specified herein. The

maximum allowable leakage rate, based on mainline pipe length, shall not exceed that in Table 5-1.

TABLE 5-1

ALLOWABLE LEAKAGE FOR 1000 FEET OF PIPE

<u>Diameter (inches)</u>	(gal/hr)	
	<u>Test Pressure (psi)</u>	
	150	200
4	0.37	0.43
6	0.55	0.64
8	0.74	0.85
10	0.92	1.06
12	1.10	1.28
14	1.29	1.48
16	1.47	1.70
18	1.66	1.91
20	1.84	2.12
24	2.21	2.25
30	2.76	3.19

Based on 11.65 gallons per day per inch of diameter per mile at 150 psi.

For pressures other than those listed above the following formula shall be used:

$$L = \frac{S \cdot D \cdot \sqrt{P}}{133,200}$$

Where: L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = test pressure during the leakage test, in pounds per square inch (gauge) at the point of lowest elevation of the tested section

5-04 SCHEDULING OF TESTS

Pressure and leakage tests shall be scheduled with the District at least two working days in advance and after receipt of all soil compaction test reports. Tests shall be witnessed by the Field Inspector.

5-05 DISINFECTION

During laying, pipelines shall be carefully protected against contamination, and all dirt and foreign material shall be removed. Before being placed in service, the lines shall be thoroughly flushed out and then disinfected, flushed and tested in accordance with AWWA C-651 "Standards for Disinfecting Water Mains". Initial chlorine concentration shall be 100 ppm. Sampling shall consist of one test taken 24 hours after flush. Initial

sample shall be taken only after the District has approved all appurtenances and facilities and if the system will be activated within 5 days. Sample shall be absent of coliform and have a heterotrophic plate count less than 200 ppm. If initial sample is rejected, all subsequent samples shall be in accordance with AWWA C-651. All bacteriological samples for new construction shall be labeled "Special – New Construction".

Test samples shall be taken by the Applicant at all piping dead ends and approximately every 500 ft. of pipe as directed by field inspector. Samples shall be taken at blowoffs, fire hydrants and services. Additional test stations are not required.

All necessary chlorine shall be furnished by the Applicant. If the first application of chlorine is not sufficient to meet bacteria standards, the procedure shall be repeated until the water will meet the bacteriological drinking water standards of State Health Department.

If a water or recycled water system sits static for more than 3 months, the system shall be flushed, resampled and tested. If the retest fails, the system shall be redisinfected, resampled and tested until the system complies.

Flushing shall comply with the Districts' NPDES permit as a minimum.

5-06 COMPLETION

After satisfactory completion of all tests, Applicant shall remove gate valve blanks in the presence of the Field Inspector. Gate valves, at connections to the existing system, shall remain closed until dedication of the system.

SECTION 6

GUARANTEES

6-01 PERFORMANCE BOND

The Applicant shall provide the District with a cash deposit or approved Performance Bond in the amount of 125 percent of the estimated construction cost. The estimated construction cost shall be prepared by the Applicant and submitted to the District for review and approval. The construction estimate shall include a 20 percent contingency allowance.

6-02 TIMELY COMPLETION

In the event the Applicant fails to complete all the specified improvements, in accordance with the District Standards, within 12 months after execution of the Water Main Extension and Facilities Construction Agreement, the District may utilize any cash deposit to complete the work or call upon the Surety Company who provided the Performance Bond.

6-03 GUARANTEE AND MAINTENANCE

The Applicant shall, by virtue of a cash deposit or an approved bond, guarantee the completed work against repairs caused by defective workmanship or materials furnished and installed for a period of 1 year from the date of the acceptance of the water system by the District. Acceptance is defined as the water system being approved by the District including all punch list items and all record drawings and GIS submittals submitted and approved by BCVWD. The Applicant shall furnish to the District a satisfactory bond based on the following scale of the total installation cost:

30% of the first \$100,000.00
20% of the second \$100,000.00
10% of installation cost over \$200,000.00

SECTION 7

PREPARATION OF WATER SYSTEM PLANS

7-01 GENERAL

All plans for water systems shall be prepared by a Civil Engineer registered in the State of California, experienced in the design of water systems. Prior to submittal for approval, the plans shall be signed by the Applicant's Engineer. The Applicant's Engineer shall be retained and paid for by the Applicant.

7-02 FORMAT

Plans shall only be prepared on reproducible sheets 24" x 36" or 22" x 34". Road construction, grading or other base maps, as approved by the District, may be used. Profiles shall be provided for all main lines.

All drafting shall be done in a manner that will produce a clear, legible reproduction. All symbols, weight of lines, size of letters and the like shall provide a product that is acceptable. Symbols, as shown in Legend on District Standard Plate D-1, shall be used where applicable.

North arrows and scale shall appear on all plans.

The vertical scale shall permit the determination of all high and low points along the alignment of the proposed water line. Top of pipe or invert elevations shall be shown at all vertical angle points, all pipe tees and crosses, and at all important points. Profile scale shall be 1" – 4' except in areas where pipe slope is greater than allowed on the profile grid, in which case 1" – 8' may be used.

The horizontal scale shall permit proper display of the improvements to be made. Distances between fittings along the pipe shall be shown together with the use of "stations" along the alignment of the pipeline. Scale shall not be smaller than 1" – 40'.

The location, description, coordinate and elevation of at least one approved Benchmark shall be shown in the title block. Benchmark shall be NAVD 88. Coordinate system and bearing shall be on California State Plane NAD 83, Zone VI, 2007 epoch adjusted.

The description of the basis of bearing shall be shown in the title block.

Plans shall include a vicinity and location map.

Plans shall include a sheet index table and map.

Plans shall show tract and lot numbers together with all existing property lines along the alignment of the water main to be constructed.

Separate plan and profile for potable and recycled water shall be provided.

Plans shall show fire flow requirements set by the Fire Marshall where applicable. Fire hydrant locations shall be approved by the Fire Marshall.

Plans shall show separate services for potable water, on-site fire protection, and recycled water as appropriate. When recycled water is used on-site, reduced pressure principle (RP) backflow assemblies shall be installed on both the recycled water and potable water service for commercial, industrial, and institutional facilities.

The plans shall show the limits and types of all existing and proposed pavement together with other items such as sidewalks, gutters, culverts, drainage ditches or structures and their relationship to the street or improvement centerline.

Proposed and existing underground utilities such as sewer, gas, telephone, electrical, culverts and drainage structures or other known facility that cross or parallel the proposed water lines shall be designated in plan and profile with dashed lines and have appropriate symbols to designate their size and type. The invert elevations of all sewer and storm drain lines shall be shown in the profile where such utilities cross the water line.

All proposed water service lines shall extend to the property lines and their location shall be shown on the plans.

Plans shall show typical street cross section showing all proposed underground utilities.

All necessary easements shall be shown on the plans. Natural ground surface or finished grade in easements shall be shown in profile.

Plans shall include a detail for location of blue pavement markers at all fire hydrant locations per Riverside County Fire Department requirements in two-way streets and at intersections.

Also see supplementary requirements for construction of water facilities in Appendix B.

7-03 GENERAL NOTES

The first sheet of water system plans shall include all of the Notes in District Standard Plate D3-1, as applicable, except as otherwise approved by the District.

7-04 LOCATION

Water mains shall be designed to have a minimum of 3 feet of cover for pipe sizes 12-inch and less and 4 feet of cover for pipe sizes greater than 12-inch, unless approved otherwise by the District. Water main profile shall be sloped to minimize high points and

low points. Combination air release-vacuum valves shall be installed at all high points and to the extent possible, drains shall be located at low points to serve as flush-outs.

Water main separation from existing and proposed sewers, storm drains, and recycled water lines shall conform to the California Code of Regulation Title 22, Chapter 16, Section 64572, copy attached in Appendix C and/or Riverside County Standard No. 609. To the extent possible, water mains shall be at least 10 feet clear distance from sewer lines when paralleling sewer lines and shall be at least 1 foot clear above sewer lines when crossing sewer lines. Separation requirements and standards are shown in District Standard Plate D4-1. Where special permission from the Health Department is necessary, it shall be the Applicant's responsibility to obtain permission in writing and provide the District with a copy of said approval, prior to approval of the Plans.

All potable water lines shall be installed minimum 4 feet clear horizontal distance and one foot clear distance above any recycled water and/or storm drain lines.

All potable water lines shall be installed minimum 2 feet clear horizontal distance and one foot clear distance from any other underground utility.

7-05 DEAD END MAINS

All mains shall be looped to the extent possible. Dead end mains will not be allowed unless approved by the District

7-06 EASEMENTS

It is the policy of the District to have all water lines placed within dedicated rights-of-way, wherever practicable. Where installation of water mains within a dedicated right-of-way is not requested or required, the Applicant shall obtain approval of the District regarding necessity and location of said easements.

Easements shall not straddle lot lines. The minimum easement width shall be 25 feet.

Should an easement be necessary, the Applicant shall:

1. Prepare an easement plat that will produce a clear and legible reproduction. Show all dimensions and necessary data including the vested ownership of each parcel and a legal description thereof. A separate sheet shall be used for the description of each parcel.
2. Submit two prints and the original of the easement plat and two copies of each easement description along with a title report from a title company acceptable to the District showing the vested ownership of record.
3. After the easement plat, legal descriptions and title reports have been reviewed by the District and found to be in order and the fee has been deposited, the

Applicant shall prepare the easement documents and obtain the required execution. The easement documents shall be executed and acknowledged in strict conformance with the form as presented.

4. After proper execution, the easement documents shall be returned to the District for final approval and acceptance and recordation. The Applicant shall pay recordation fees.
5. The water system construction plans will not be approved by the District until necessary executed instruments of conveyance have been received by and approved by the District.

7-07 CERTIFICATIONS AND SIGNATURES

The following items shall appear on the first sheet of water system plans.

Applicant's Engineer Certificate

This certifies that on _____, 20____, I have reviewed the plans of domestic water system for and they meet the requirements of the California Section of the American Water Works Association, and the Riverside County Standards where the installation is within said County, for minimum requirements for safe practice in the production and distribution of water for domestic use.

The distribution system and transmission mains at the point of supply to this tract are adequate to supply water to all the sections of the tract in accordance with Section 5-21 of the above quoted standards.

I certify that the design of the water systems is in accordance with the requirements prescribed by the Riverside County Fire Department.

By: _____
Registered Engineer No. _____ Date _____

District Engineer's Certificate

This certifies that these plans and specifications have been reviewed by and are hereby approved by Beaumont Cherry Valley Water District and that this District is willing and able to supply water to every lot in this tract in accordance with the pure water laws of the State of California.

By: _____
District Engineer _____ Date _____

RIVERSIDE COUNTY
Fire Department
Approved by the Riverside County Fire Department

By: _____

Date: _____

7-08 PLAN APPROVAL

Plans shall be signed by the District Engineer upon satisfactory completion of all plan requirements. After approval, and prior to start of construction, submit 2 sets of blue line full-size prints and one set of blue line prints reduced to 11"x17" to the District Engineer. Signed mylars shall be kept with the Applicant's Engineer until "Record Drawings" are prepared. "Record Drawings" and Contractor's red line drawings shall be submitted to the District for final review and comment prior to final submittal of "Record Drawings" mylars to the District. Approved "Record Drawings" mylars shall be forwarded to the District at the end of the project prior to final acceptance of the project. All record drawings shall have the following statement on each sheet of the plans above the title block in the lower right corner as practical:

RECORD DRAWINGS

THIS RECORD DRAWING HAS BEEN PREPARED BASED ON INFORMATION
SUBMITTED, IN PART, BY OTHERS. THE ENGINEER HAS NOT VERIFIED
THE ACCURACY OF THIS INFORMATION AND SHALL NOT BE
RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE
INCORPORATED HEREIN AS A RESULT.

DATE:____ BY: _____
(Name of Firm)

A sheet revision number shall be included in the "Revision Description" block with the words, "Record Drawing". Also a corresponding revision triangle number shall be added after the corresponding sheet number.

Record Drawings may be revised by hand on original signed mylars if changes are minimal and a "sticky-back" label, with the above disclaimer note, attached to each sheet. Each sheet shall then be reproduced as a duplicate mylar and submitted to the District. If revisions are extensive, the changes shall be incorporated electronically with the disclaimer note added and signed by the engineer responsible for the plans, then submitted to the District Engineer for signature.

Approval of the plans by the District does not constitute a representation as to the accuracy of the location or existence or nonexistence of any utility or structure within the limits of the project.

It should be clearly understood that the approval of the project by the District is based upon the street improvement plans and the tract map submitted by the Applicant. In the event there are no approved street improvement plans and/or the recorded tract map, it shall be the responsibility of the Applicant to notify the District of such changes. Further approval by the District will be required.

7-09 CHANGE OF PLANS

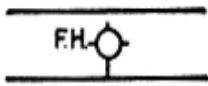
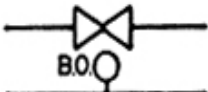
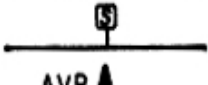
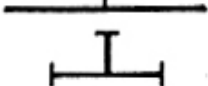
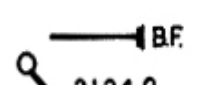
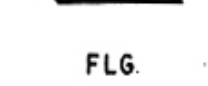
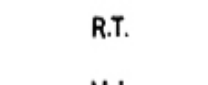
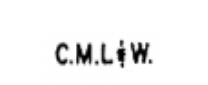
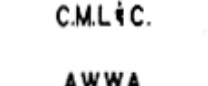
Any changes to the approved plans shall only be with the written approval of the District Engineer.

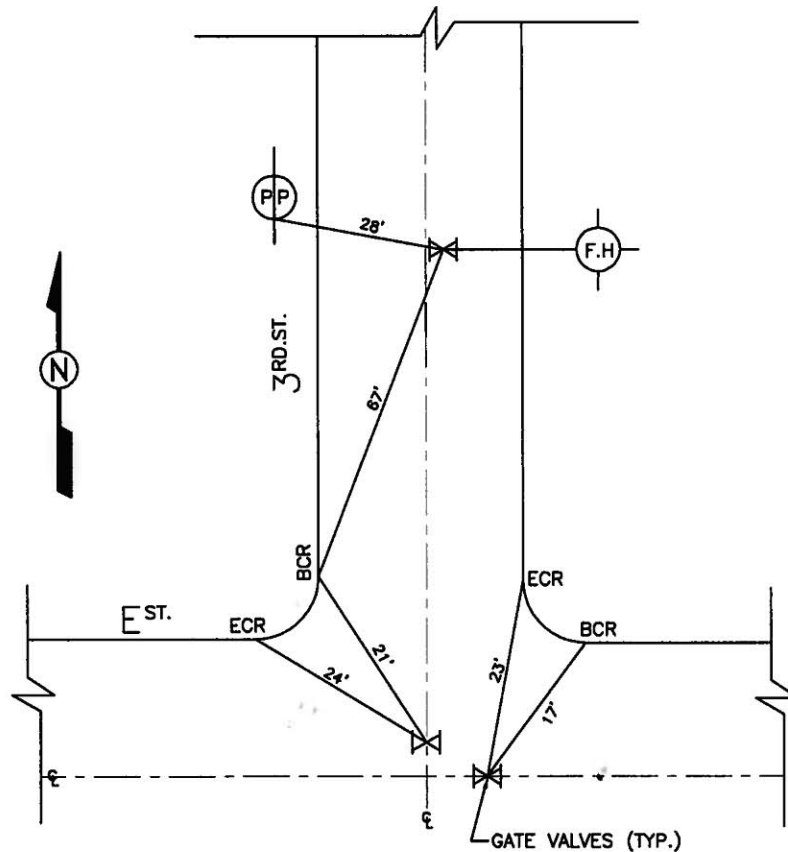
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BEAUMONT CHERRY VALLEY WATER DISTRICT

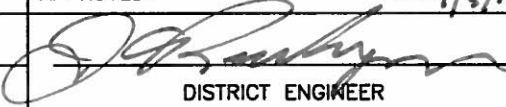
DRAFTING LEGEND

--- W ---	EXISTING WATER PIPELINE
--- S ---	EXISTING SEWER LINE
--- G ---	EXISTING GAS LINE
--- E ---	EXISTING ELECTRICAL CONDUIT
--- SD ---	EXISTING STORM DRAIN
--- T ---	EXISTING TELEPHONE CONDUIT
	PROPOSED WATER PIPELINE
	FIRE HYDRANT ASSEMBLY
	GATE VALVE
	BLOWOFF ASSEMBLY
	DOMESTIC SERVICE Ø 1" DENOTES SIZE
	AIR AND VACUUM RELEASE ASSEMBLY
	FLANGED FITTINGS
	BLIND FLANGE
	INVERT ELEV OF PROPOSED PIPE
FLG.	FLANGED
R.T.	RING TITE
M.J.	MECHANICAL JOINT
C.M.L. & W.	CEMENT MORTAL LINED AND WRAPPED STEEEL PIPE
C.M.L. & C.	CEMENT MORTAR LINED AND COATED STEEL PIPE
AWWA	AMERICAN WATER WORKS ASSOCIATION
(RES)	RESTRAINED FITTINGS



NOTE:
ALL VALVES MUST HAVE TWO STATIONARY TIE OFF POINTS.
EXAMPLE: CURB RADIUS, POWER POLE OR CHISELED W V
ON TOP OF CURB WITH EXACT MEASUREMENT TO CENTER
OF VALVE LID.

NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
03/10	APPROVED:	DATE: 1/5/11		
 DISTRICT ENGINEER			INTERSECTION TIE DETAIL	PLATE D-2

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BEAUMONT CHERRY VALLEY WATER DISTRICT

The following general notes and requirements must be on the first sheet of all water plans submitted to the District for approval.

GENERAL NOTES

GENERAL NOTES

1. All work shown on these plans shall be performed in accordance with the "District Standards for the Furnishing of Materials and the Construction of Water and Recycled Water Facilities and Preparation of Water System Plans", latest revision, and the adopted addendums thereto.
2. Work shall be performed by a contractor licensed in the state of California, experienced in water utility construction.
3. Contractor shall obtain construction permit from the District and pay inspection and valve cover deposit prior to construction.
4. Unless otherwise indicated, all pipes shall be cement mortar lined ductile iron pipe, minimum Pressure Class 150, with push-on joints. All pipes shall be installed with tracer wire. Tracer wire shall be 14-gauge, insulated (Blue Color) solid copper wire.
5. For separation requirements between water and recycled water, storm drains, and sewer lines, see Riverside County Standard No. 609 and California Code of Regulations, Title 22, Section 64572.
6. The contractor shall contact underground service alert of southern California at 811 / 800-227-2600 for location of all underground utilities, two working days prior to commencing work.
7. Contractor shall obtain necessary permits from city of Beaumont, and/or Riverside County, as appropriate, prior to construction.
8. All fire hydrants shall be installed in accordance with District Standard Plate No. 1-1 (1-2) and shall be type Jones 3765 6"x4"x2.5"x2.5" outlet.
9. Contractor shall notify the District at (951) 845-9581 two working days prior to commencing work on the water utility installation. Contractor shall notify District by preceding Wednesday at 4:00 p.m. prior to working during the weekend. Cancellations shall be notified to the District by preceding Friday at 3:00 p.m.
10. No existing distribution system valve shall be operated by the contractor. District personnel will operate all necessary valves.
11. No deviations from these plans shall be permitted without the approval of the District.

12. Existing water mains shall not be taken out of service for more than 4 hours. Contractor shall notify all water users affected by the shutdown a minimum of 48 hours prior to the actual shutdown. Indicate the date and precise hours that the main will be taken out of service.
13. Fire flow for this project is _____ gpm at 20 psi residual
14. Contractor shall conform to the street excavation replacement standards of the City of Beaumont or Riverside County, whichever has jurisdiction.
15. Contractor shall notify the District at (951) 845-9581 two working days prior to placement of concrete for sidewalks.
16. Air vacuum release assemblies per District Standard Plates No. 5-1 and 5-2 shall be installed at all high points on the water main. Additional assemblies over those shown on the drawings may be necessary when substructures require a change in line or grade of the water line.
17. Contractor to install minimum 1" copper, Type K, service laterals in accordance with District specifications shown on District Standard Plate 6-2, Plate 6-3, and Plate 12.
18. Contractor shall coordinate all reconnects with District personnel prior to any connections or retirements of any District facilities.
19. Contractor shall restrain all joints at tees, elbows, dead ends, etc. as indicated on the plans, as a minimum. See Construction Note _____ on Sheet _____.
20. Contractor shall bear all costs for the correction or removal and replacement of defective work, and all additional direct and indirect costs the City, County, or District may incur on account of defective work, including the costs of additional administrative, professional consultant, inspection, testing, and other services.
21. Contractor shall install blue reflective pavement markers in accordance with the Riverside County Fire Department "Guidelines for Fire Hydrant Markings" latest revision and Detail _____ on Sheet _____.
22. All fire hydrant barrels are to be chrome yellow with tops and nozzle caps painted with the following capacity-indicating color scheme; Class-A green.
23. All dry-utilities shall be located on opposite property line from water service lateral or no closer than 2' to any water service lateral.
24. All pipe shall be hydro tested, disinfected and approved prior to final connection to existing water lines.
25. Basis of water line stationing shall be along street centerline, unless otherwise noted.
26. All materials shall be of domestic origin and not of foreign manufacture.
27. Contractor shall furnish to the District electronic files in AutoCAD format of the signed and approved "Record Drawings" and GIS digital data definition tables, per District standards, prior to final acceptance of the work.

28. Contractor shall furnish to the District copies of all soil compaction test reports for the installed water mains two (2) working days prior to hydro testing of pipelines.
29. Contractor shall furnish to the District intersect tie plates in accordance with District Standard Plate No. D-2 for all valve locations prior to final acceptance of the work.

RECYCLED WATER GENERAL NOTES

1. All work shown on these plans shall be performed in accordance with the "District Standards for the Furnishing of Materials and the Construction of Water and Recycled Water Facilities and Preparation of Water System Plans", latest revision, and the adopted addendums thereto.
2. Work shall be performed by a contractor licensed in the state of California, experienced in water utility construction.
3. Contractor shall obtain construction permit from the District and pay inspection and valve cover deposit prior to construction.
4. Unless otherwise indicated, all pipe shall be cement mortar lined ductile iron pipe, minimum Pressure Class 150, with push-on joints. All ductile iron pipe shall be installed with purple color-coded polyethylene encasement in accordance with AWWA C105 and recommendations from the Ductile Iron Pipe Research Association (DIPRA). Color shall be Pantone 512. Polyethylene material shall be 8-mil linear low-density (LLD) film. Installation method shall be in accordance with Method A per AWWA C105. Tracer wire shall be 14-gauge, insulated (blue color) solid copper wire. Polyethylene bags and/or warning tape shall have the words "Caution – Water Reclamation Line" or similar wording in black printing. The warning tape shall be continuous along the entire pipeline and laterals and shall be taped to the pipeline at intervals not to exceed 10 feet. All above ground appurtenances shall be color coded purple, Pantone 512 and marked/signage indicating: "Non Potable Water – Do Not Drink" or similar wording and identified per AWWA Standards and Section 116815 of the California Health and Safety Code.
5. For separation requirements between water and recycled water, storm drains, and sewer lines, see Riverside County Standard No. 609 and California Code of Regulations, Title 22, Section 64572.
6. The contractor shall contact underground service alert of southern California at 811 / 800-227-2600 for location of all underground utilities, two working days prior to commencing work.
7. Contractor shall obtain necessary permits from city of Beaumont, and/or Riverside County, as appropriate, prior to construction.
8. Contractor shall notify the District at (951) 845-9581 two working days prior to commencing work on the recycled water utility installation. Contractor shall notify District by preceding Wednesday at 4:00 p.m. prior to working

during the weekend. Cancellations shall be notified to the District by preceding Friday at 3:00 p.m.

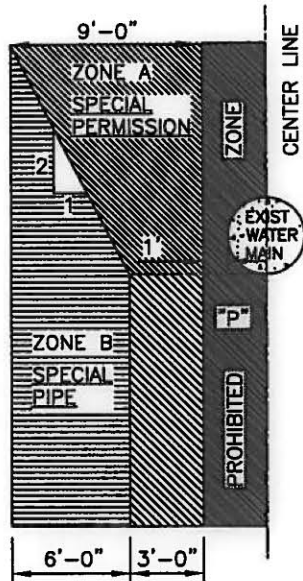
9. No existing distribution system valve shall be operated by the contractor. District personnel will operate all necessary valves.
10. No deviations from these plans shall be permitted without the approval of the District.
11. Existing recycled water mains shall not be taken out of service for more than 4 hours. Contractor shall notify all water users affected by the shutdown a minimum of 48 hours prior to the actual shutdown. Indicate the date and precise hours that the main will be taken out of service.
12. Contractor shall conform to the street excavation replacement standards of the city of Beaumont or Riverside County, whichever has jurisdiction.
13. Contractor shall notify the District at (951) 845-9581 two working days prior to placement of concrete for sidewalks.
14. Air vacuum release assemblies per District Standard Plates No. 5-1 and 5-2 shall be installed at all high points on the water main. Additional assemblies over those shown on the drawings may be necessary when substructures require a change in line or grade of the water line. Air/vacuum piping shall be purple color-coded tape wrapped or with polyethylene encasement per General Note 4.
15. Contractor to install minimum 1" copper, Type K, service laterals in accordance with District specifications shown on District Standard Plate 6-2 and Plate 12.
16. All copper services shall be installed with tape wrap or with polyethylene encasement per General Note 4.
17. Contractor shall coordinate all reconnects with District personnel prior to any connections or retirements of any District facilities.
18. Contractor shall restrain all joints at tees, elbows, dead ends, etc. as indicated on the plans, as a minimum. See Construction Note _____ on Sheet _____.
19. Contractor shall bear all costs for the correction or removal and replacement of defective work, and all additional direct and indirect costs the City, County, or District may incur on account of defective work, including the costs of additional administrative, professional consultant, inspection, testing, and other services.
20. All dry-utilities shall be located on opposite property line from water service lateral or no closer than 2' from any water service lateral.
21. All pipe shall be hydro tested, disinfected and approved prior to final connection to existing recycled water lines.
22. Basis of recycled water line stationing shall be along street centerline, unless otherwise noted.
23. All materials shall be of domestic origin and not of foreign manufacture.

24. Contractor shall furnish to the District electronic files in AutoCAD format of the signed and approved "Record Drawings" and GIS digital data definition tables, per District standards, prior to final acceptance of the work.
25. Contractor shall furnish to the District copies of all soil compaction test reports for the installed recycled water mains prior to final acceptance of the work.
26. Contractor shall furnish to the District intersect tie plates in accordance with District Standard Plate No. D-2 for all valve locations prior to final acceptance of the work.

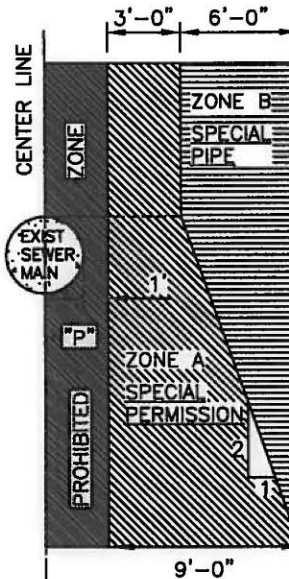
CONSTRUCTION NOTES

POTABLE AND RECYCLED WATER

1. All mechanical fittings to be restrained.
2. All hydrant tees shall be mechanical joint X flange outlet.
3. All joints to be restrained shall be with U. S. Pipe, "Field-Lok 350", mega lugs (if mechanical joint), McWane, Sure Stop 350 gaskets, or District approved equal.
4. All hydrant, drain, and blow-off laterals shall have restrained joints.
5. Install restrained joints (two pipe lengths) before and after all tees, crosses, and elbows (horizontal and vertical), as a minimum.
6. All proposed 4 inch blow-off and air vacuum valve assemblies at interface connections are temporary.
7. Domestic water line shall be minimum Pressure Class 200 DIP under storm drain crossings. A 20' length of DIP shall be centered under storm drain such that no water main joints are within 4' of the outside diameter of the storm drain. The vertical clear separation shall be minimum 1 foot.



NEW SEWER MAIN

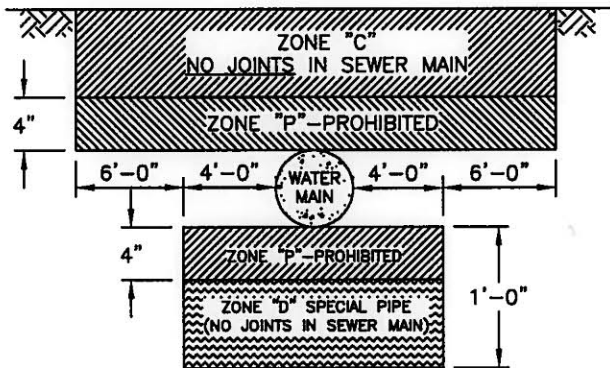


NEW WATER MAIN

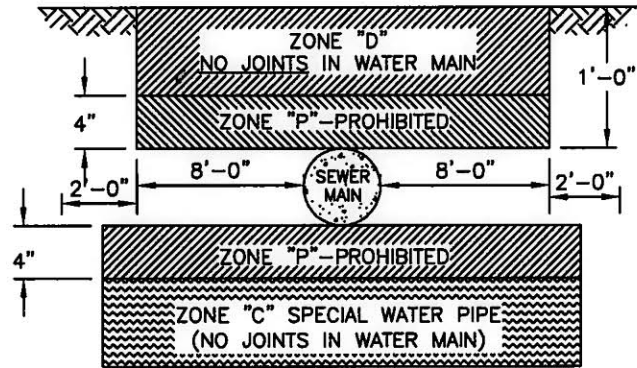
NOTE:

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).
 DIMENSIONS ARE FROM OUTSIDE OF WATER MAIN TO OUTSIDE OF SEWER.

PARALLEL CONSTRUCTION



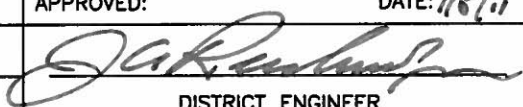
NEW SEWER MAIN



NEW WATER MAIN

CROSSINGS

NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
03/10	APPROVED:	DATE: 11/6/11		
 DISTRICT ENGINEER			WATER-SEWER SEPARATION REQUIREMENTS	PLATE D4-1

BEAUMONT CHERRY VALLEY WATER DISTRICT

WATER - SEWER SEPARATION REQUIREMENTS

Appropriate alternative construction criteria for two different cases in which the regulatory criteria for sanitary sewer main and water main separation cannot be met are shown in District Standard Plate No. D4-1.

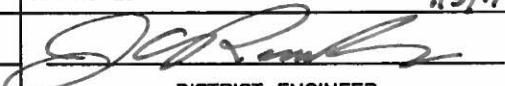
- Case 1 – New sanitary sewer main and a new or existing water main; alternative construction criteria apply to the sanitary sewer main.
- Case 2 – New water main and an existing sanitary sewer main; alternative construction criteria may apply to either or both the water main and sanitary sewer main.

Case 1: New Sanitary Sewer Main Installation

ZONE SPECIAL CONSTRUCTION REQUIRED FOR SEWER

- A. Sewer lines will not be permitted in this zone without prior written approval from the Health Department and Beaumont Cherry Valley Water District.
- B. If the water main does not meet the class 2 Zone B requirements given below, the sewer should be constructed of one of the following:
1. High-density-polyethylene (HDPE) pipe with fusion welded joints (per AWWA C906);
 2. Spirally-reinforced HDPE pipe with gasketed joints (per ASTM F-894);
 3. Extra strength vitrified clay pipe with compression joints;
 4. Class 4000, Type II, asbestos-cement pipe with rubber gasket joints;
 5. PVC sewer pipe with rubber ring joints (per ASTM D3034) or equivalent;
 6. Cast or ductile iron pipe with compression joints; or
 7. Reinforced concrete pressure pipe with compression joints (per AWWA C302).
- C. If the water main crossing below the sanitary sewer main does not meet the requirements for Case 2 Zone C, the sanitary sewer main should have no joints within ten feet from either side of the water main (in Zone C) and should be constructed of one of the following:
1. A continuous section of ductile iron pipe with hot dip bituminous coating; or
 2. One of the Zone D options 1, 3, 4, or 5 below.
- D. If the water main crossing above the sanitary sewer main does not meet the Case 2 Zone D requirements, the sanitary sewer main should have no joints within four feet from either side of the water main (in Zone D) and be constructed of one of the following:
1. HDPE pipe with fusion-welded joints (per AWWA C906)
 2. Ductile iron pipe with hot dip bituminous coating and mechanical joints (gasketed, bolter joints);
 3. A continuous section of Class 200 (DR 14 per AWWA C900) PVC pipe or equivalent, centered over the pipe being crossed; or
 4. A continuous section of reinforced concrete pressure pipe (per AWWA C302) centered over the pipe being crossed; or
 5. Any sanitary sewer main within a continuous sleeve.

NOT TO SCALE

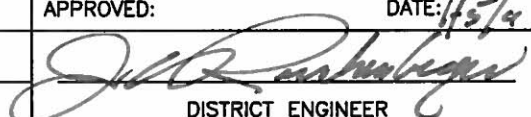
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/5/11		
			WATER-SEWER SEPARATION REQUIREMENTS	PLATE D4-2
	DISTRICT ENGINEER			

Case 2: Special Construction Required for Water Main

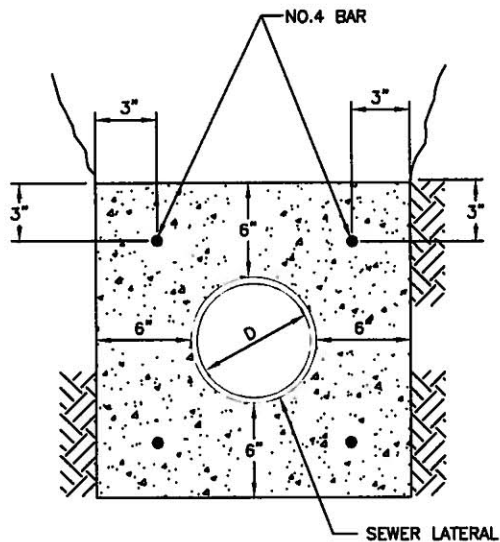
ZONE SPECIAL CONSTRUCTION REQUIRED FOR SEWER

- A. No water mains shall be constructed without prior written authorization from the Health Department.
- B. If the sewer does not meet the Case 1 Zone B requirements given above, the water main shall be constructed of one of the following:
 - 1. Ductile iron pipe with hot dip bituminous coating.
 - 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.
- C. If the sewer crossing above the water main does not meet the Class 1 Zone C requirements given above, the water main should have no joints within ten feet from either side of the sewer main (in Zone C) and be constructed of one of the following:
 - Ductile iron pipe with hot dip bituminous coating.
 - Dipped and wrapped one-fourth-inch-thick welded steel pipe.
- D. If the sanitary sewer main crossing below the water main does not meet the requirements for Case 1 Zone D, the water main should have no joints within eight feet from either side of the sanitary sewer main (in Zone D) and should be constructed as for Zone C.

NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			WATER-SEWER SEPARATION REQUIREMENTS	PLATE D4-3
	DISTRICT ENGINEER			

FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates




HOUSE LATERALS:

THE SPECIAL CONSTRUCTION REQUIREMENTS SHALL APPLY TO SEWER HOUSE LATERALS THAT CROSS ABOVE A WATER MAIN, BUT NOT TO THOSE SEWER HOUSE LATERALS THAT CROSS BELOW A WATER MAIN.

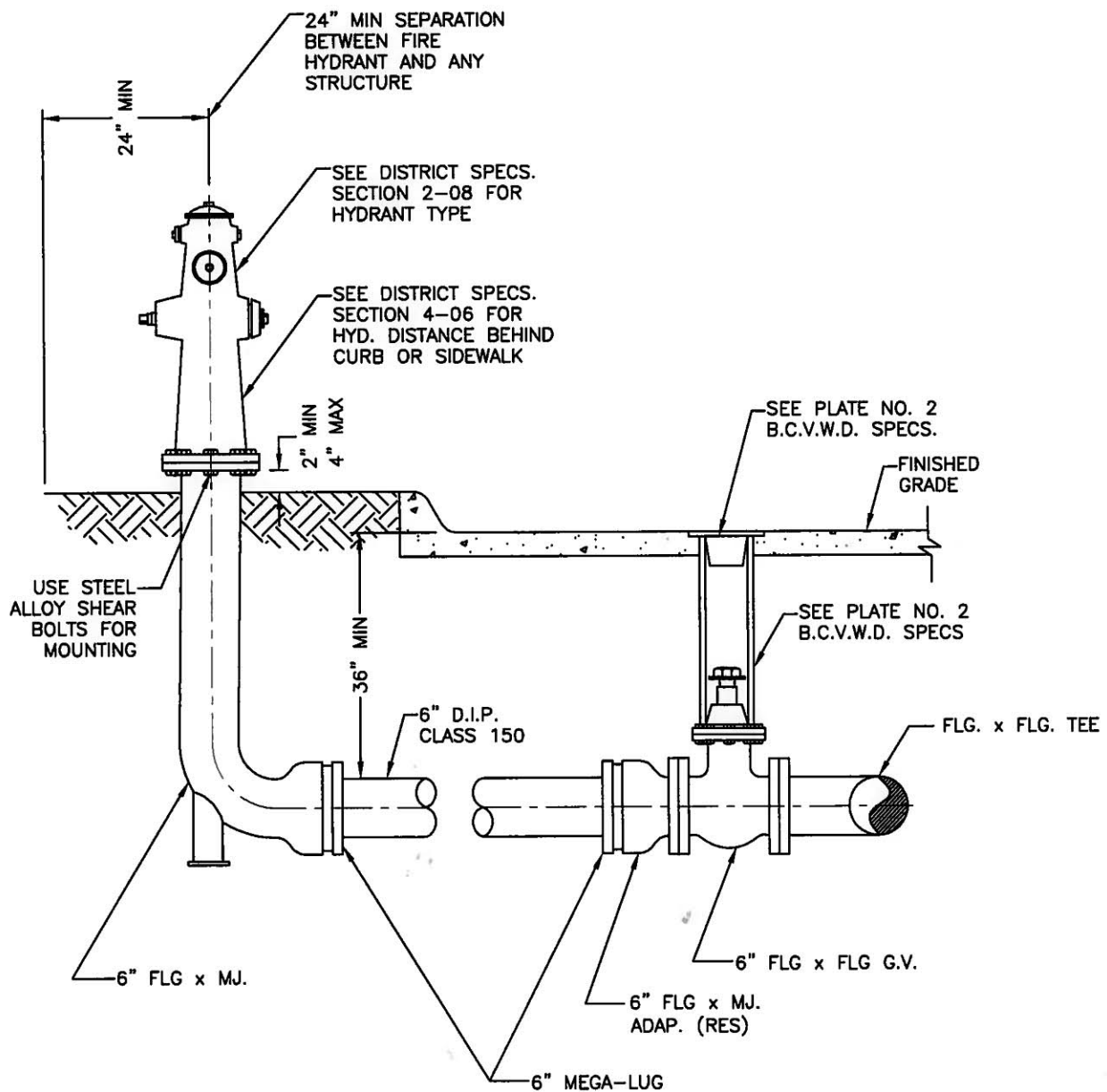
CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI.

CONCRETE ENCASEMENT SHALL EXTEND 10' BEYOND WATER SERVICE ON BOTH SIDES.

NOT TO SCALE


REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 4/5/11		
	 DISTRICT ENGINEER		HOUSE WATER AND SEWER LATERAL CROSSINGS	PLATE D4-4

FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates

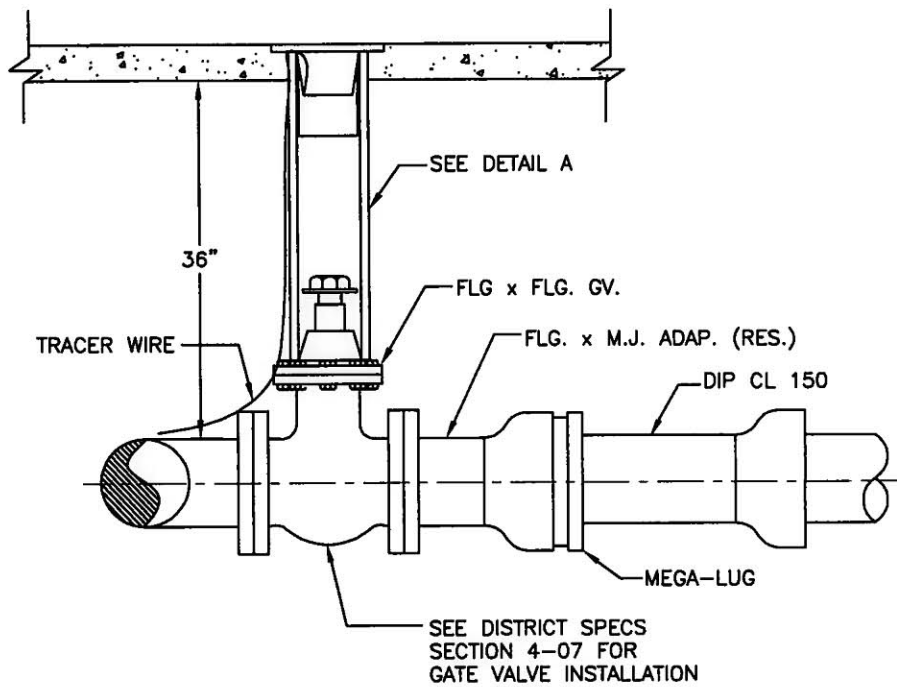


NOTE:
SHEAR BOLTS SHALL BE USED EVEN IF BREAK AWAY SPOOLS
ARE USED ON TOP OF BURY.

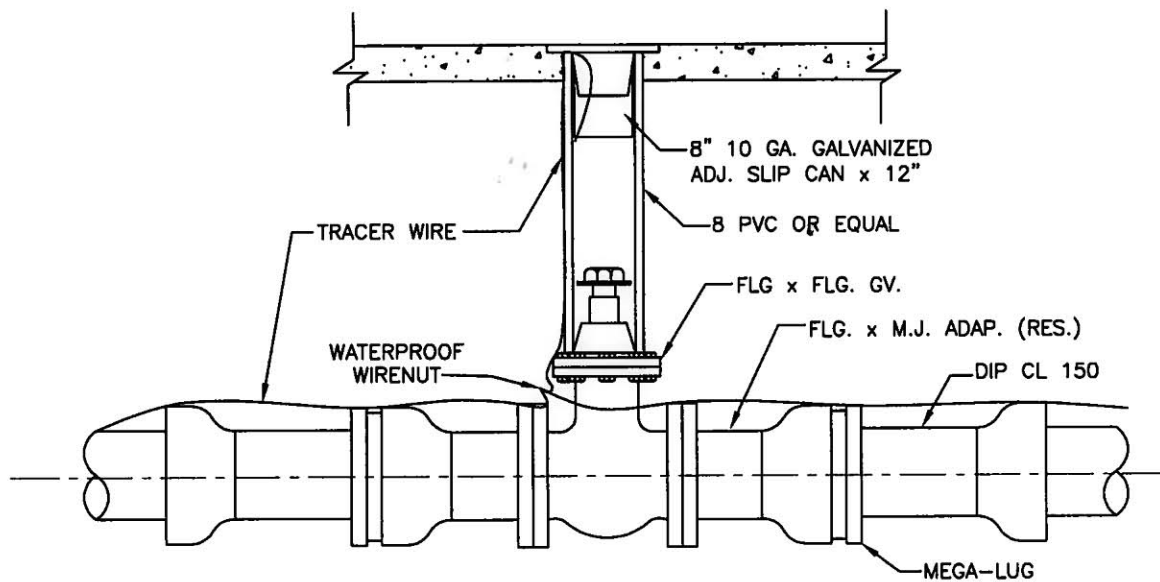
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/13/11		
	 DISTRICT ENGINEER		STANDARD FIRE HYDRANT	PLATE 1

FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates

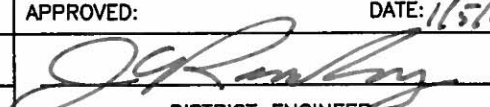


DETAIL B-(LATERAL VALVE)

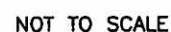


DETAIL-A (IN LINE VALVE)

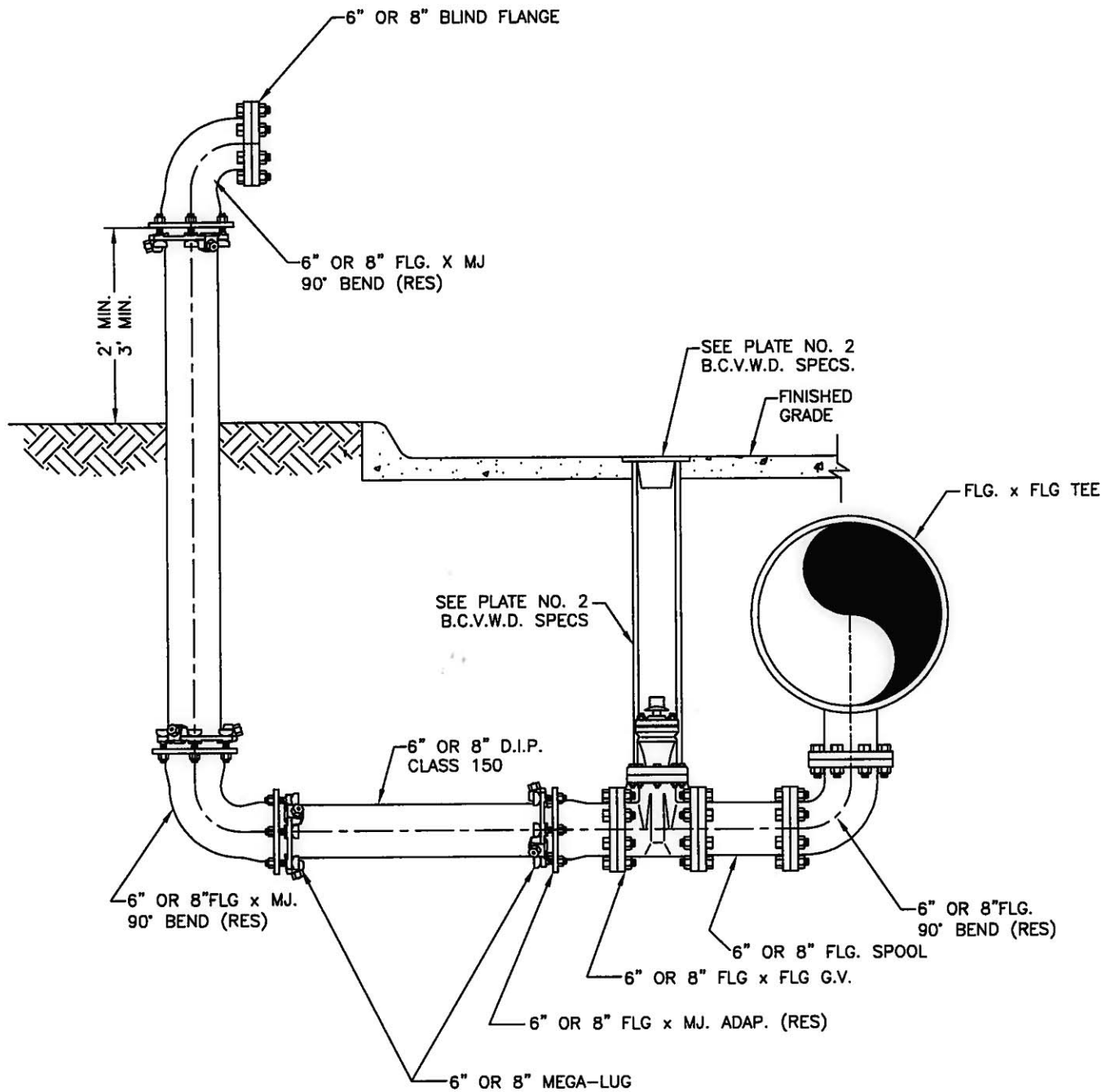
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/5/10		
			GATE VALVE/VALVE CAN INSTALLATION	PLATE 2
	DISTRICT ENGINEER			

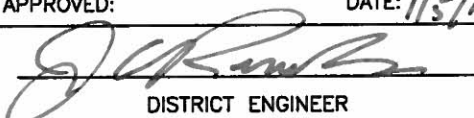
FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates



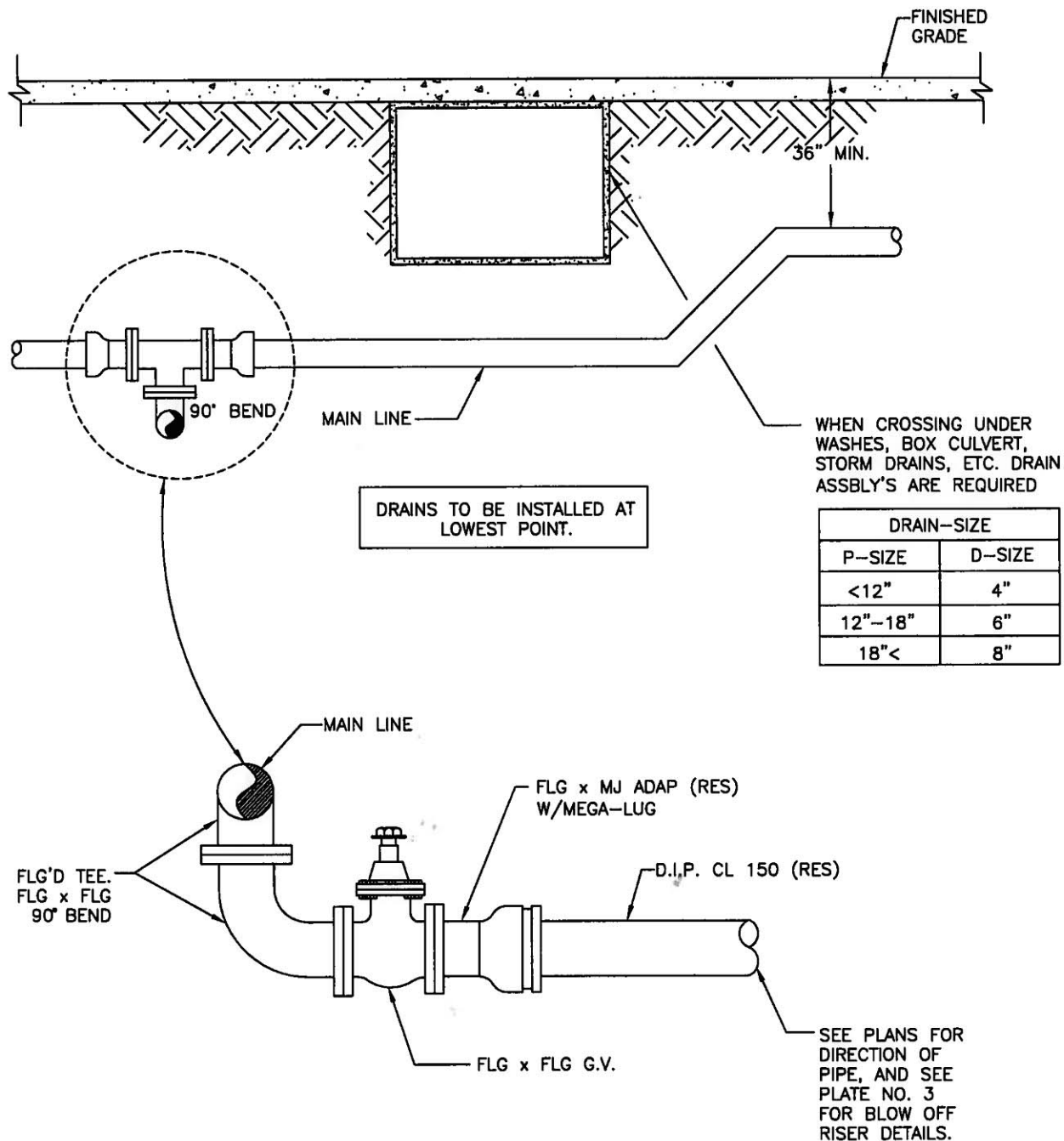
FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates



NOT TO SCALE

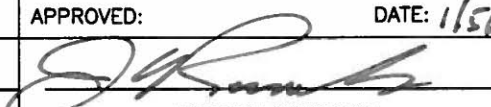
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
	 DISTRICT ENGINEER		6 & 8-INCH BLOWOFF DETAIL	
				PLATE 3-2

FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates

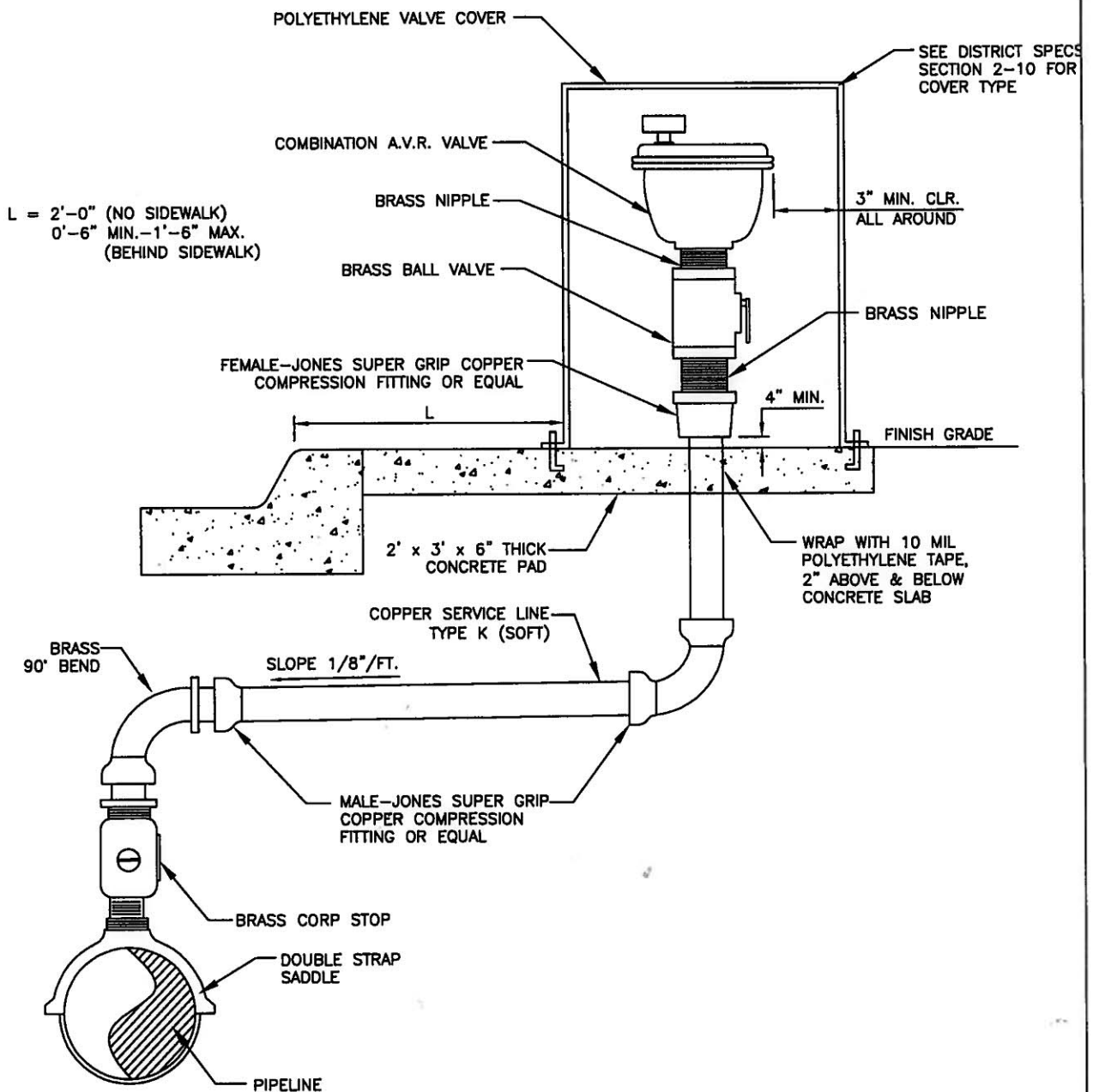


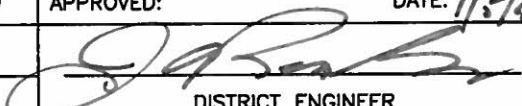
NOTE: NO WATER MAIN JOINTS UNDER STORM DRAIN FACILITIES ARE ALLOWED.

NOT TO SCALE

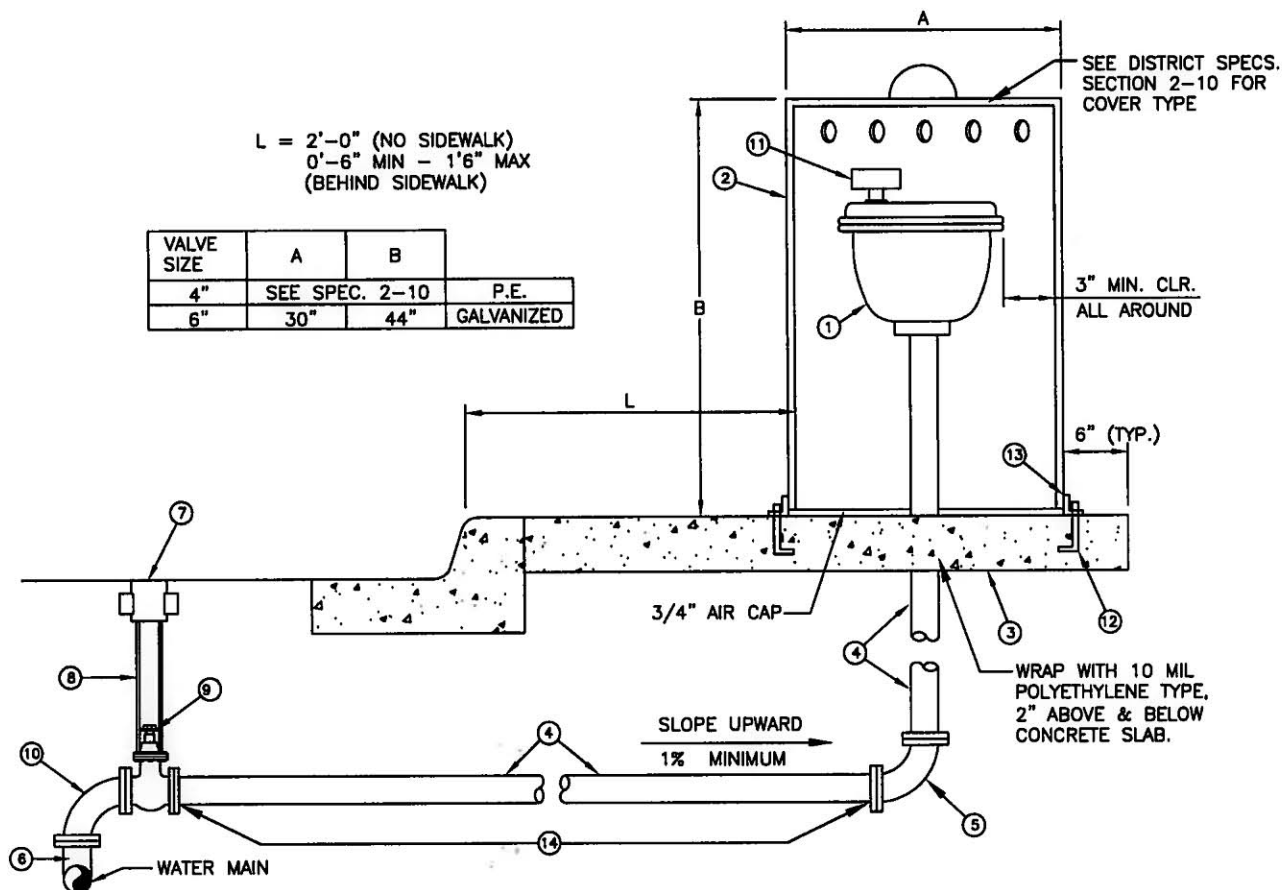
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			DRAIN DETAIL	PLATE 4
	DISTRICT ENGINEER			

FILE: X:\BCWWD_Projects\District_Projects\Standards\Plates



REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			2" COMBINATION AIR-VAC ASSEMBLY DETAIL	PLATE 5-1
	DISTRICT ENGINEER			

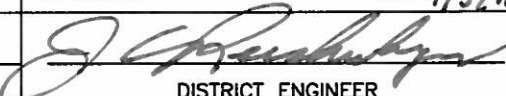
FILE: X:\BCWD_Projects\District_Projects\Standards\Plates



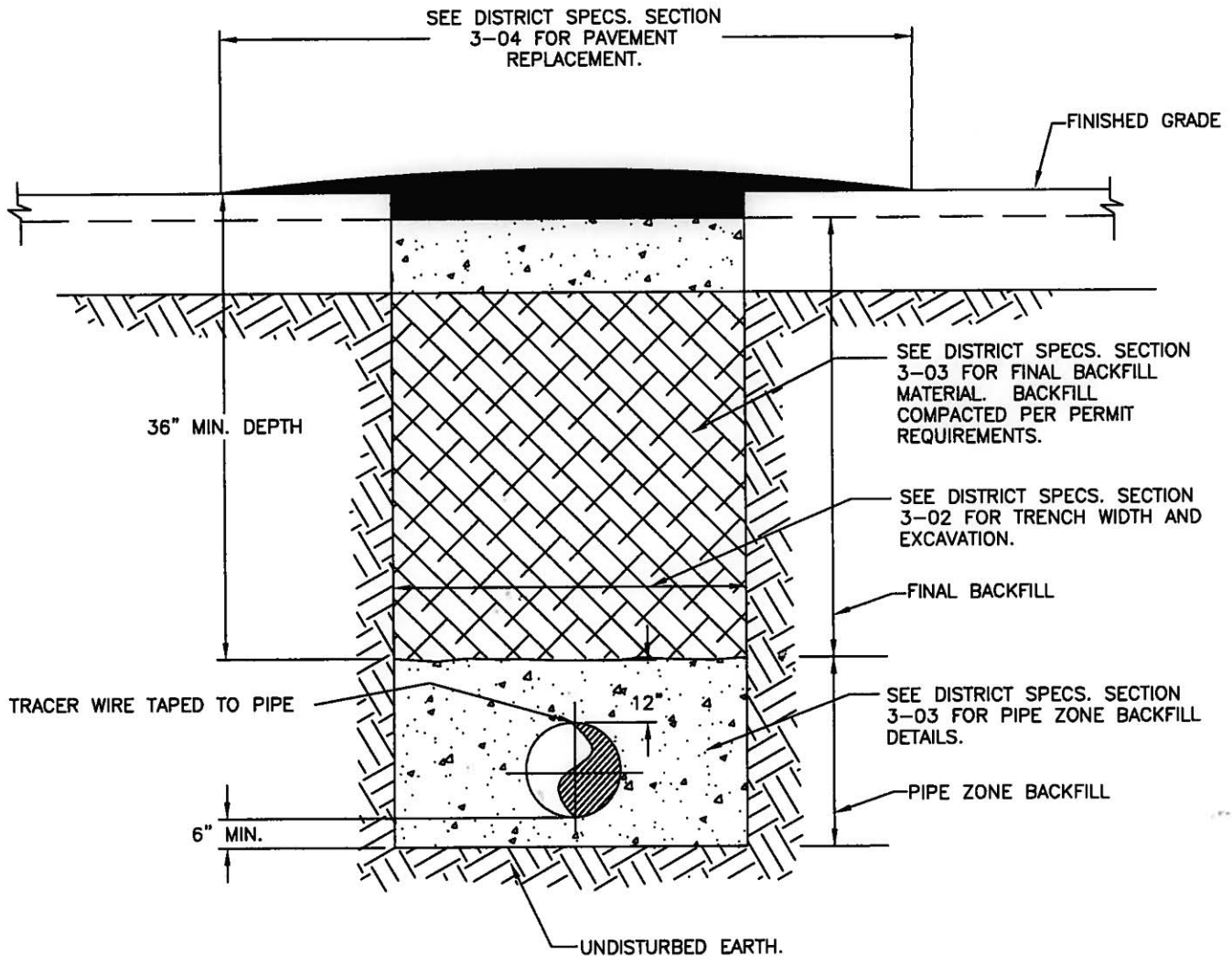
DETAIL NOTES:

- | | |
|---|--|
| <p>① COMBINATION AIR/VACUUM VALVE. SEE DISTRICT STANDARDS</p> <p>② ENCLOSURE</p> <p>③ 6" THICK CONCRETE PAD</p> <p>④ DUCTILE IRON PIPE. ALL JOINTS RESTRAINED.</p> <p>⑤ 90° BEND FLANGED OR M.J. (RES).</p> <p>⑥ FLANGED TEE w/FLG. X M.J. ADPT</p> <p>⑦ VALVE BOX ASSEMBLY PER DISTRICT STANDARD PLATE NO. 2</p> | <p>⑧ NOT USED</p> <p>⑨ RESILIENT SEAT GATE VALVE, FLANGED</p> <p>⑩ 90° BEND FLANGED OR M.J. (RES).</p> <p>⑪ THREADED PRE-FAB PVC SCREEN OUTLET WITH RIGID STAINLESS STEEL SCREEN</p> <p>⑫ 4-5/8" X 3" ANCHOR BOLTS CAST IN PLACE OR REDHEAD (EQUALLY SPACED) (FOR 6" BLOWOFFS ONLY)</p> <p>⑬ 4-2"x2"x1 1/2"x1/4" L-CLIPS</p> <p>⑭ FLG x MJ ADAPTERS (RES).</p> |
|---|--|


NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
	 DISTRICT ENGINEER		4" & 6" COMBINATION AIR-VAC ASSEMBLY DETAIL	PLATE 5-2

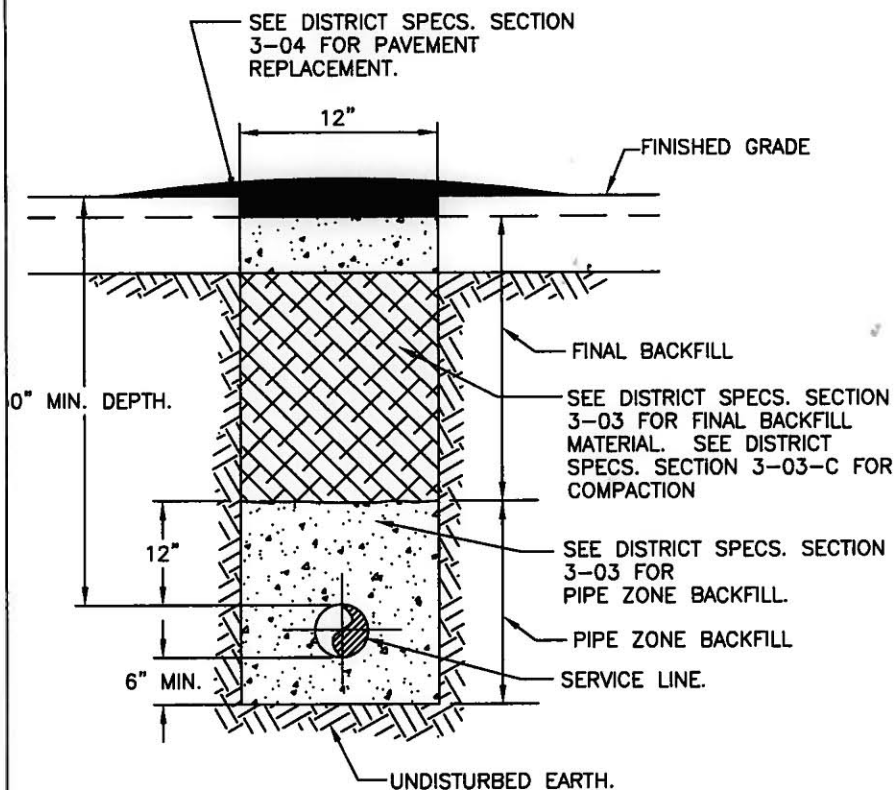
FILE: X:\BCWWD_Projects\District_Projects\Standards\Plates




NOT TO SCALE

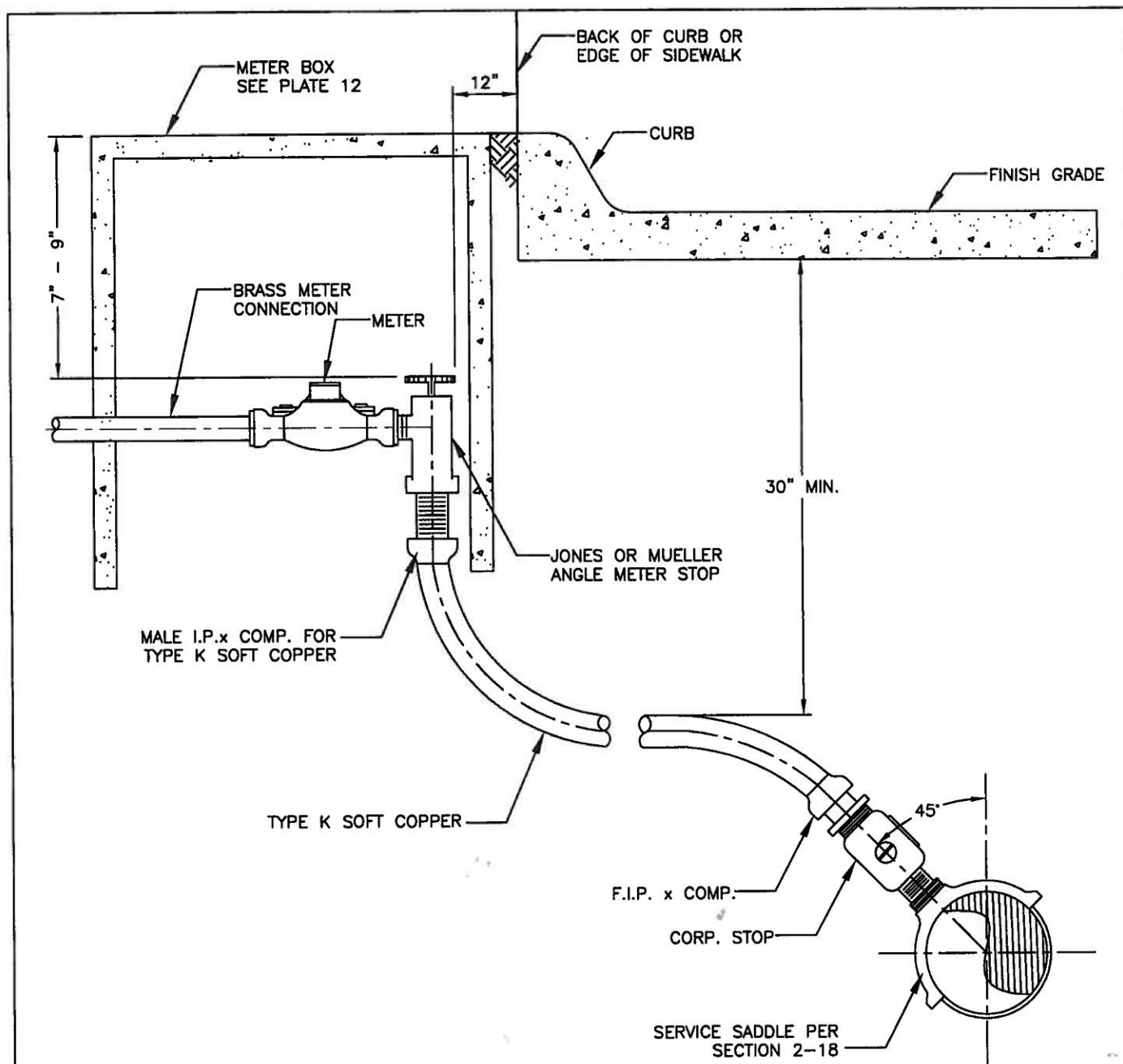
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			TRENCH DETAIL	PLATE 6-1
	DISTRICT ENGINEER			

FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates



NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT
12/10	APPROVED:	DATE: 11/5/61	
			SERVICE TRENCH DETAIL
	DISTRICT ENGINEER		
			PLATE 6-2



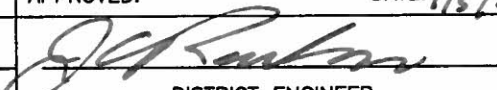
NOTES:

NO INTERMEDIATE COUPLINGS ARE ALLOWED BETWEEN CORPORATION STOP AND ANGLE METER STOP.

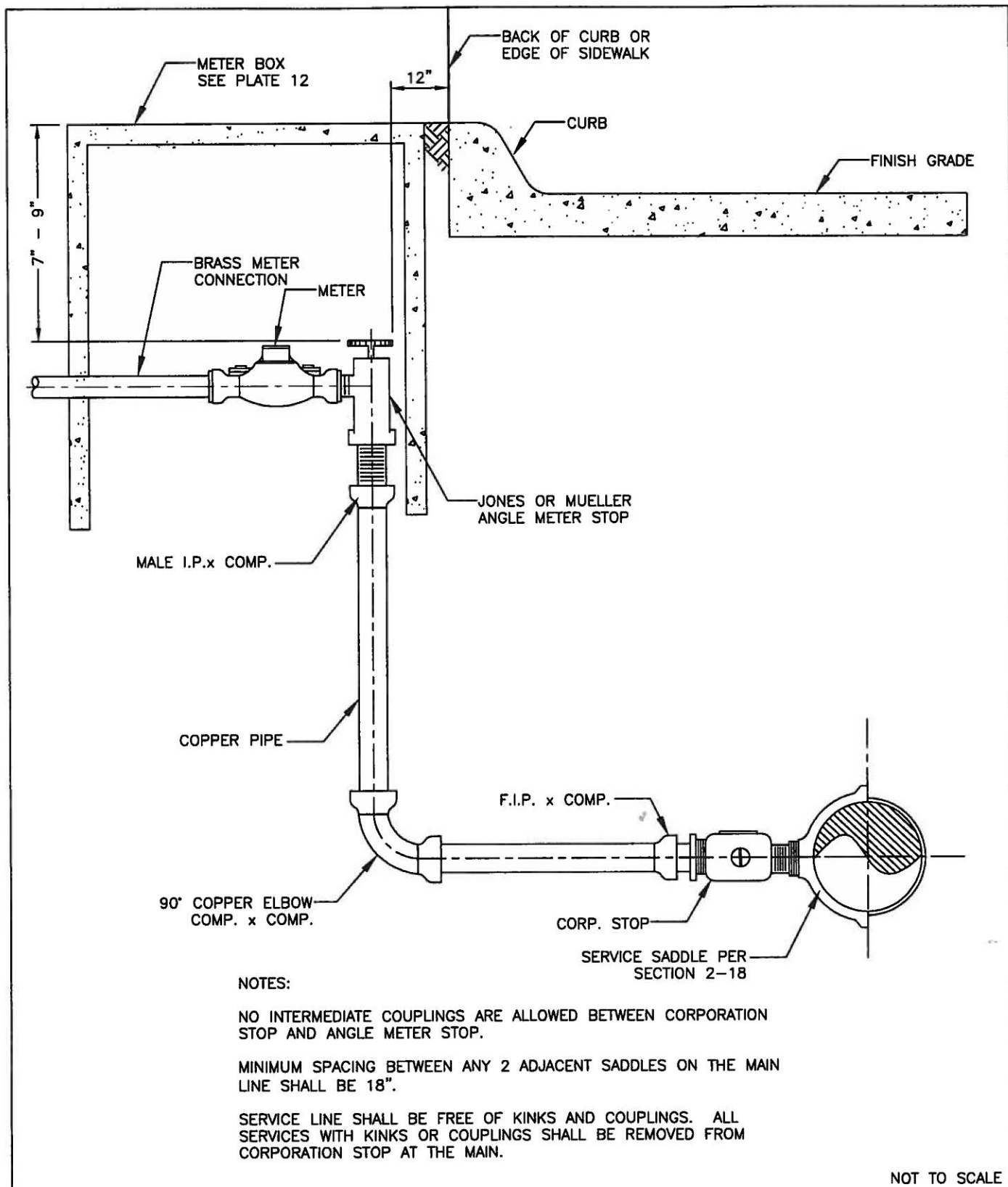
MINIMUM SPACING BETWEEN ANY 2 ADJACENT SADDLES ON THE MAIN LINE SHALL BE 18\".

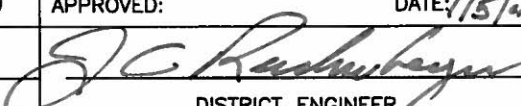
SERVICE LINE SHALL BE FREE OF KINKS AND COUPLINGS. ALL SERVICES WITH KINKS OR COUPLINGS SHALL BE REMOVED FROM CORPORATION STOP AT THE MAIN.

NOT TO SCALE

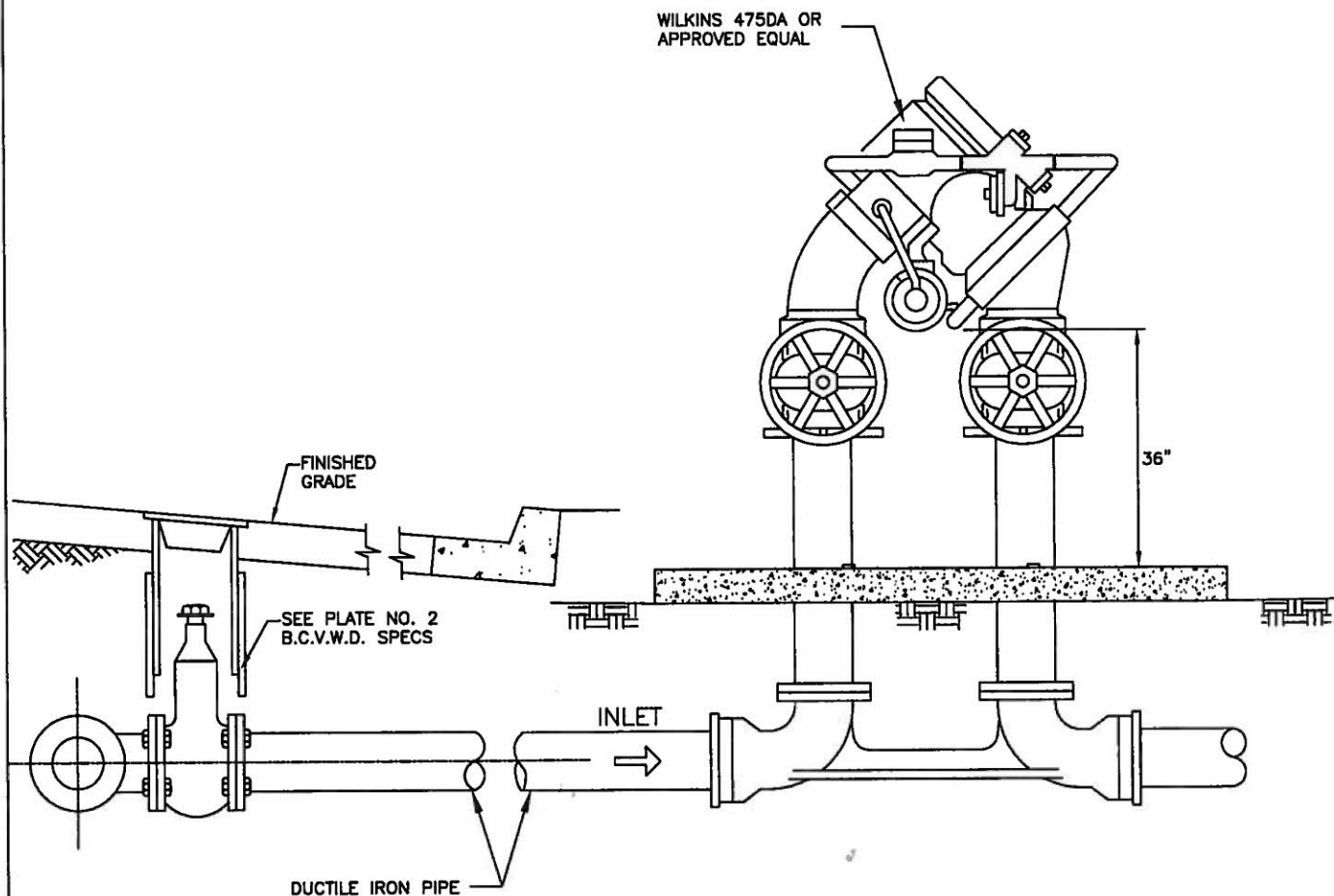
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			1" SERVICE LINE DETAIL	PLATE 6-3
	DISTRICT ENGINEER			

FILE: X:\BCWD_Projects\District_Projects\Standards\Plates

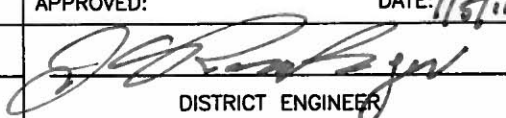


REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			2" SERVICE LINE DETAIL	PLATE 6-4
DISTRICT ENGINEER				

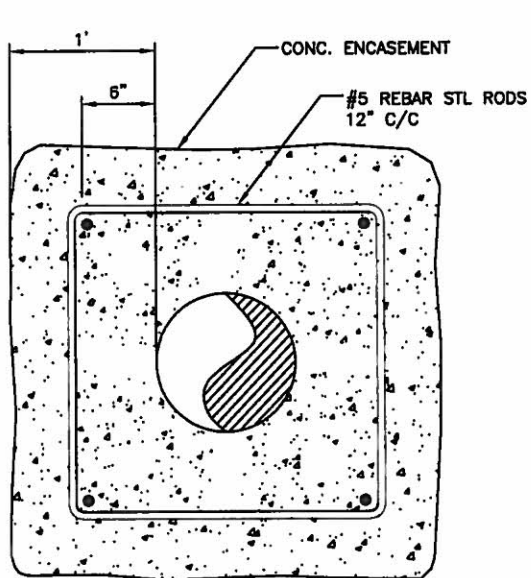
FILE: X:\BCWD_Projects\District_Projects\Standards\Plates



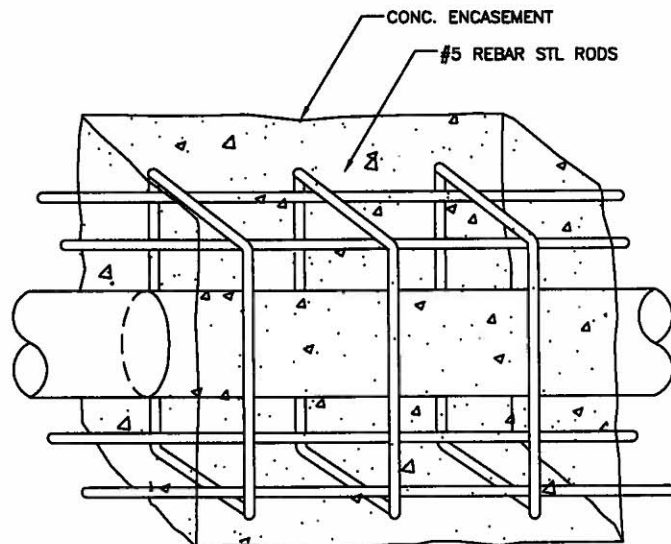
NOT TO SCALE

REVISED	PREPARED BY: BCVWD	DATE: 11-09	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/5/11		
	 DISTRICT ENGINEER		FIRE SERVICE METER ASSEMBLY W/WILKINS 475DA BACKFLOW	PLATE 7

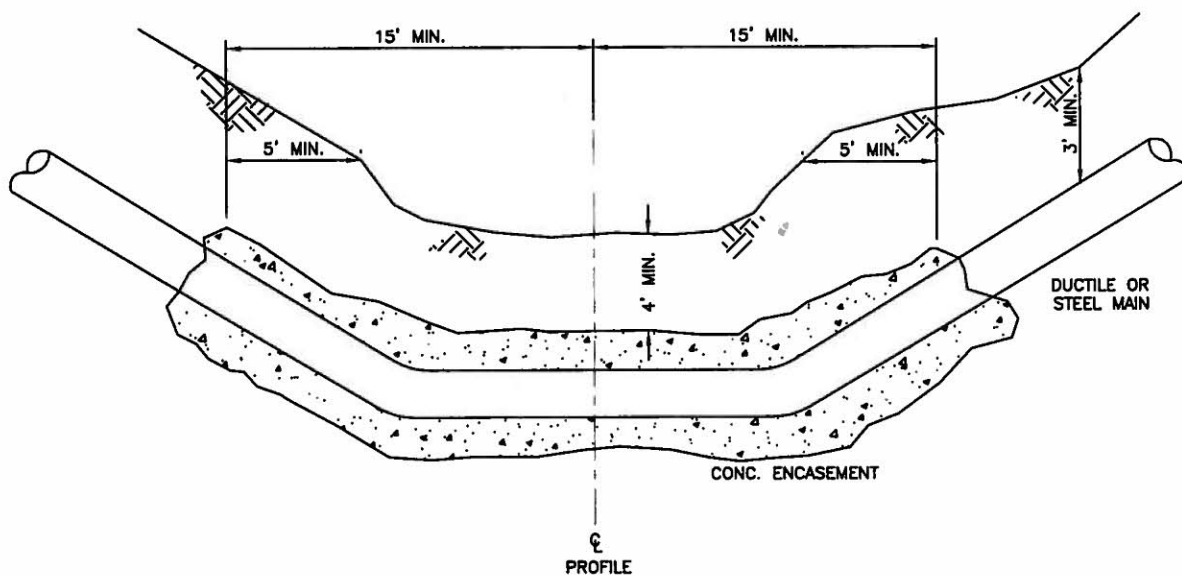
FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates



END VIEW



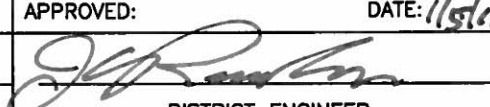
SIDE VIEW



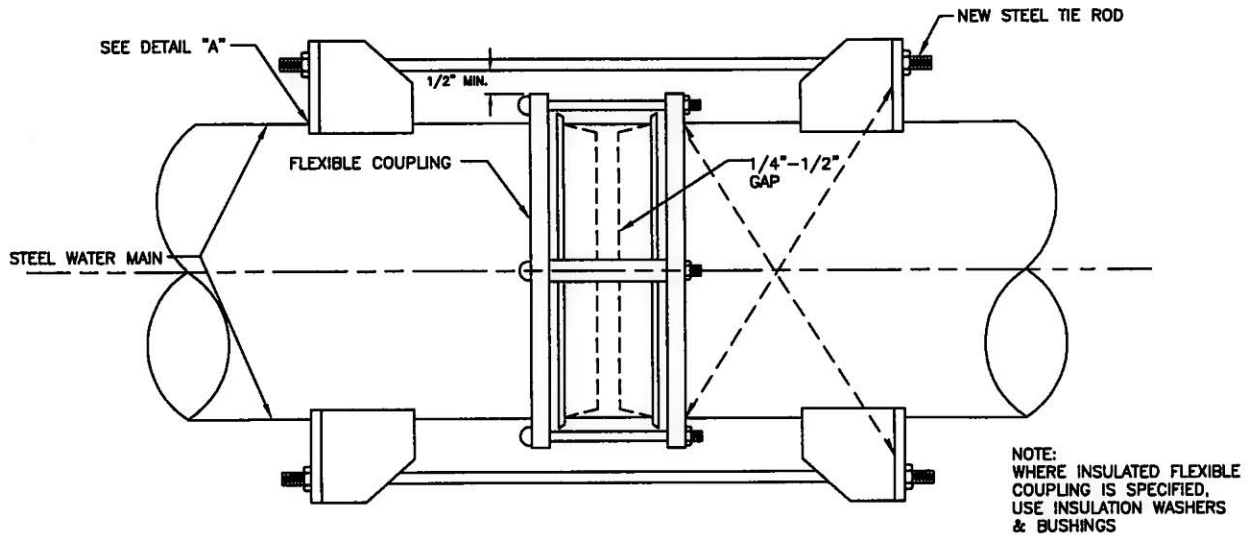
PROFILE

NOTE:
ALL PIPE TO BE CONCRETE ENCASED SHALL BE POLYETHYLENE WRAPPED.

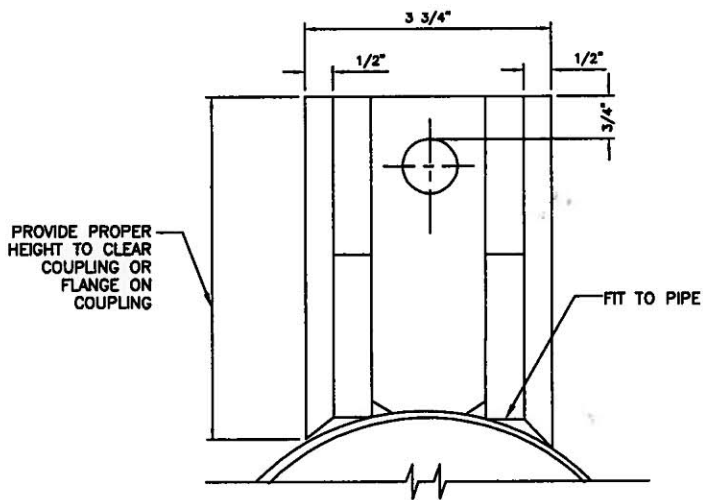
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/5/11		
			CONCRETE ENCASEMENT DETAILS	PLATE 8
	DISTRICT ENGINEER			

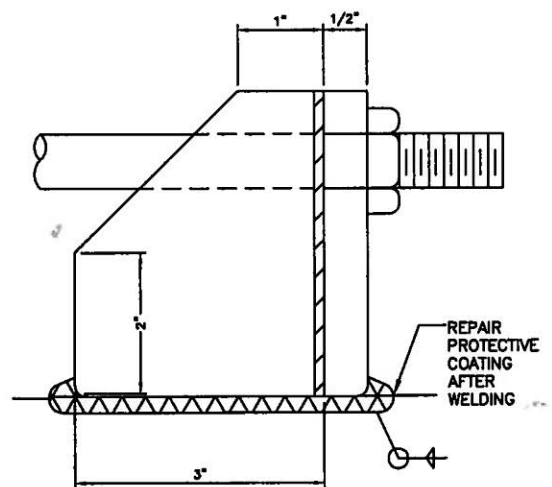
FILE: X:\BCVWD_Projects\District_Projects\Standards\Plates



PLAN VIEW




DETAIL "A"

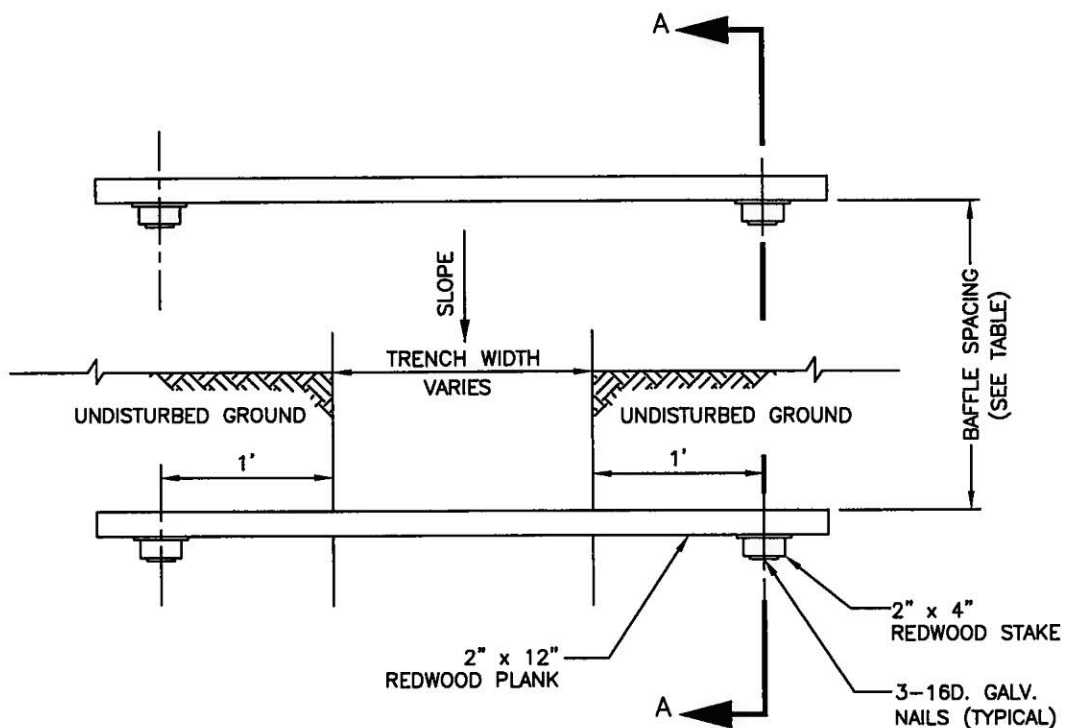


- NOTE:
1. INSTALL TIES ALONG THE HORIZONTAL AXIS OF PIPELINE.
 2. CONTRACTOR TO FURNISH COAL TAR ENAMEL AND PAINT ALL EXPOSED SURFACES.
 3. HARNESS LUG DESIGN SHALL BE PER AWWA M-11.

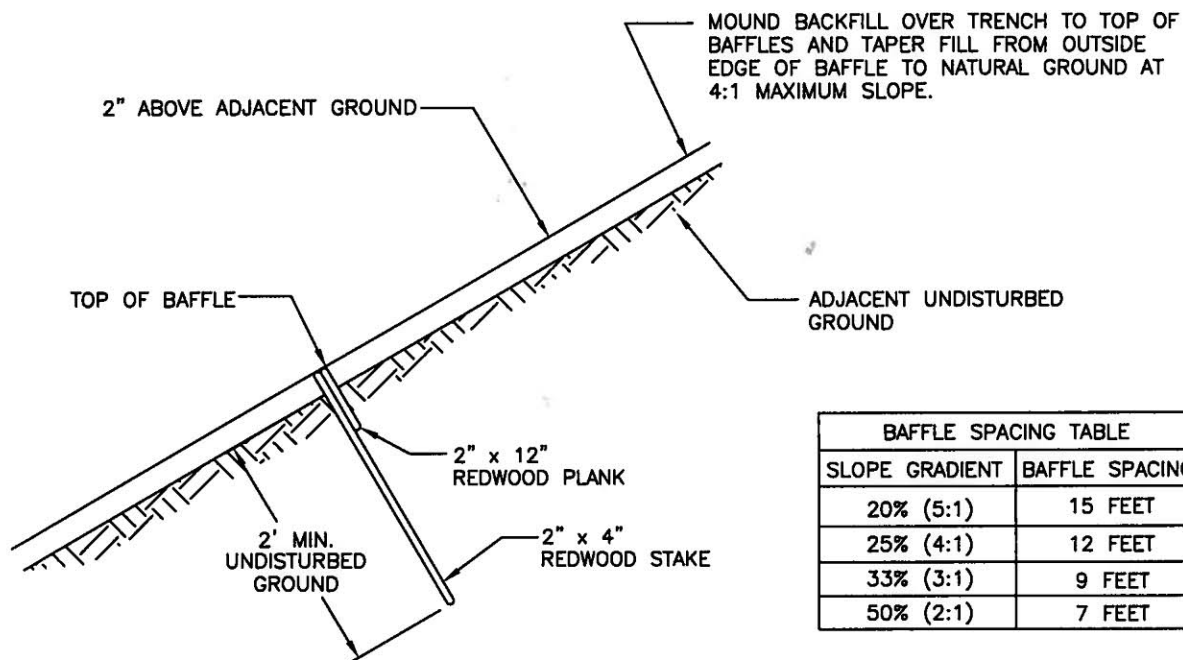
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/5/11		
			FLEXIBLE COUPLING TIE DETAILS	PLATE 9
	DISTRICT ENGINEER			

FILE: W:\Pasadena Sector\Projects\BCWWD\STANDARDS



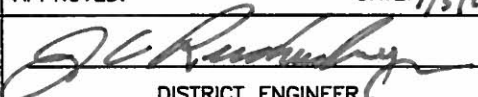
PLAN



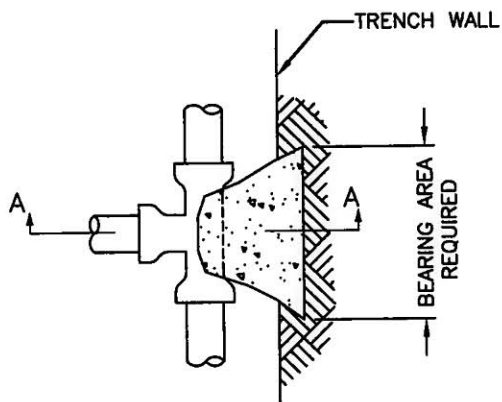
SECTION A-A

BAFFLE SPACING TABLE	
SLOPE GRADIENT	BAFFLE SPACING
20% (5:1)	15 FEET
25% (4:1)	12 FEET
33% (3:1)	9 FEET
50% (2:1)	7 FEET

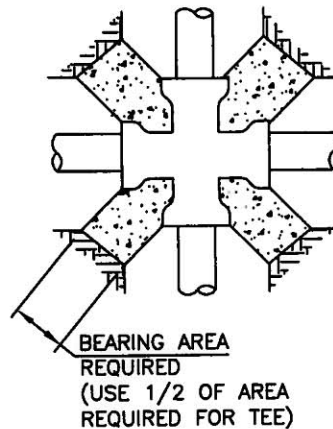
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			BAFFLE INSTALLATION DETAILS	PLATE 10
	DISTRICT ENGINEER			

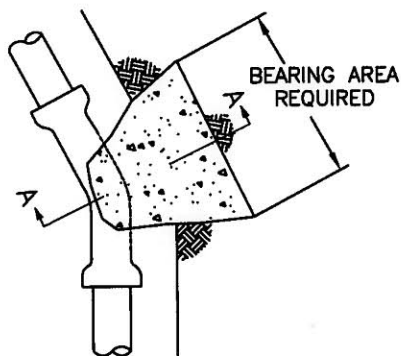
FILE: W:\Pasadena Sector\Projects\BCVWD\Standards\Plates



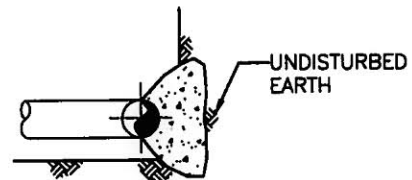
TEE



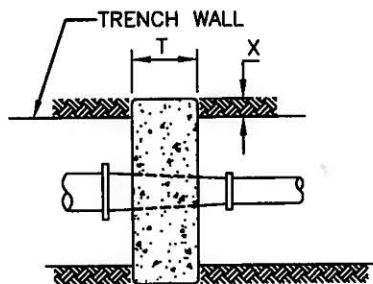
CROSS



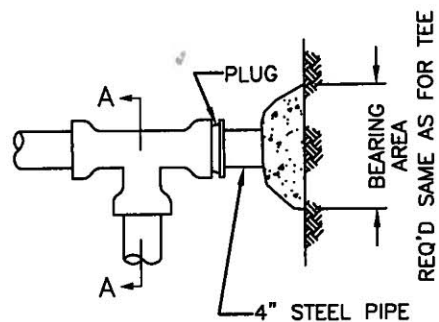
HORIZONTAL ELBOW



SECTION A




REDUCER



TEE WITH PLUG

NOTE:
FOR THRUST BLOCK SIZES SEE PLATE NO. 11-2.

NOT TO SCALE

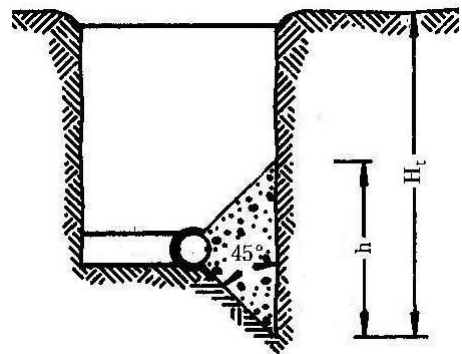
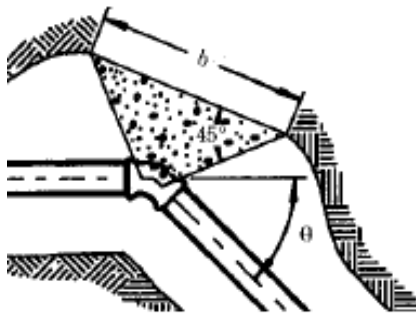
REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 11/3/10		
			THRUST BLOCK DETAILS	PLATE 11-1
	DISTRICT ENGINEER			

**Beaumont Cherry Valley Water District
THRUST BLOCK SIZE FOR
HORIZONTAL PRESSURES
(BASED ON 2500 LB/SQ.FT. BEARING PRESSURE)**

PIPE DIA	PIPE CLASS	PRES psi	Area in Square Feet				
			Tee	90° Bend	45° Bend	22½° Bend	11¼° Bend
6	150	150	3.4	4.8	2.6	1.3	0.7
		225	5.0	7.1	3.9	2.0	1.0
8	150	150	5.8	8.2	4.4	2.3	1.1
		225	7.7	10.9	5.9	3.0	1.5
10	150	150	8.7	12.3	6.7	3.4	1.7
		225	13.1	18.5	10.0	5.1	2.6
12	150	150	12.3	17.4	9.4	4.8	2.4
		225	18.5	26.1	14.1	7.2	3.6
14	150	150	16.5	23.4	12.7	6.5	3.2
		225	24.8	35.1	19.0	9.7	4.9

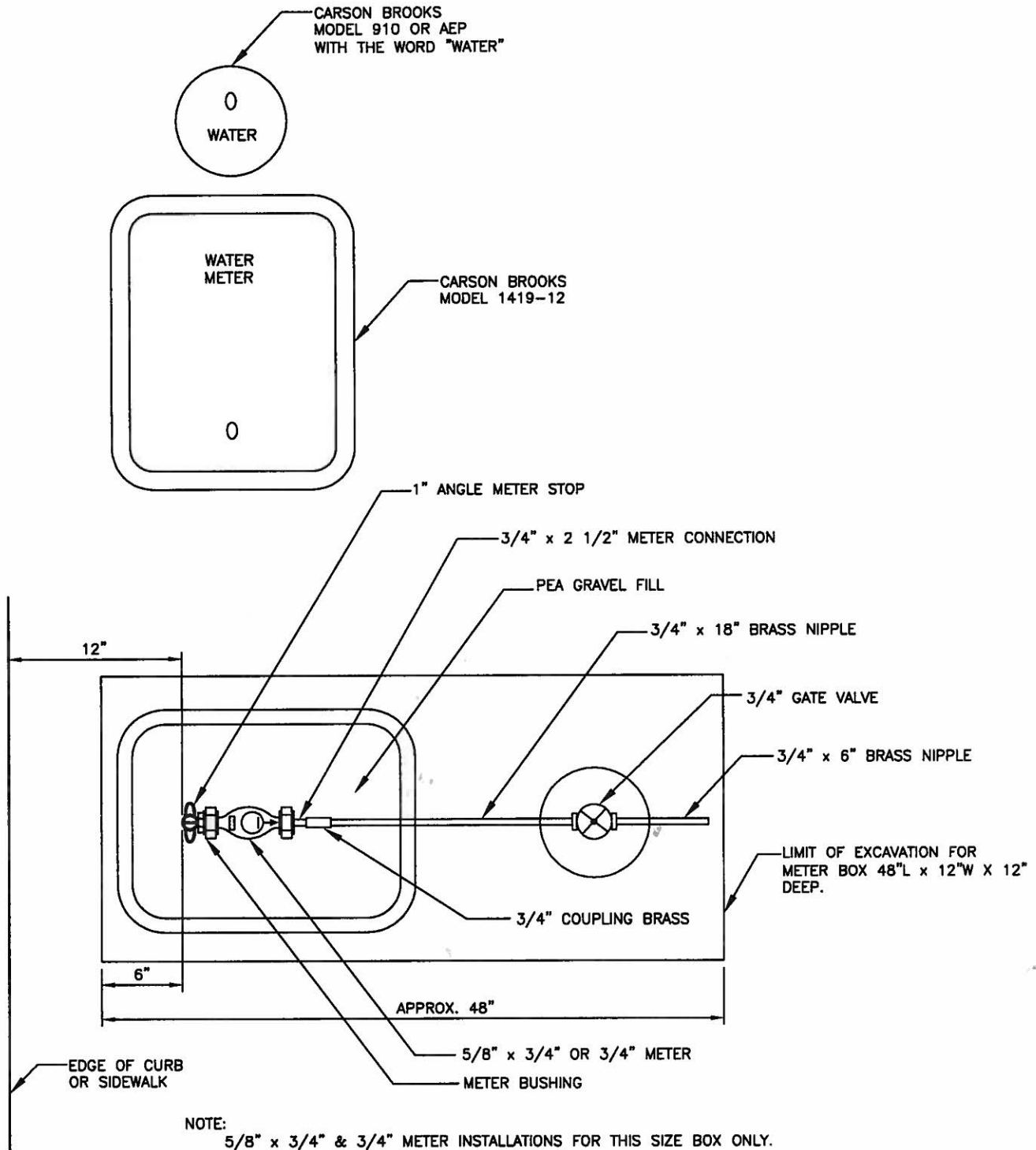
REDUCERS

Reducer Size	Pipe Class	Pressure (psi)	Dimensions		
			b	h	t
8 X 6	150	150	14"	2' - 2"	12"
		225	18"	2' - 6"	12"
10 X 8	150	150	16"	2' - 4"	12"
		225	20"	2' - 10"	12"
12 X 10	150	150	18"	2 - 6"	12"
		225	20"	3' - 4"	12"
14 X 12	150	150	18"	2 - 10"	12"
		225	22"	3' - 6"	12"




General criteria for bearing block design:

1. Bearing surface should, where possible, be placed against undisturbed soil. Where it is not possible, the fill between the bearing surface and undisturbed soil must be compacted to at least 90% Standard Proctor density.
2. Block height (h) should be equal to or less than one-half the total depth to the bottom of the block, (H_T), but not less than the pipe diameter (D).
3. Block height (h) should be chosen such that the calculated block width (b) varies between one and two times the height.
4. For bearing capacities less than 2500 LB/SQ.FT. a proportional increase in bearing area will be required. Provide supporting geotechnical report.



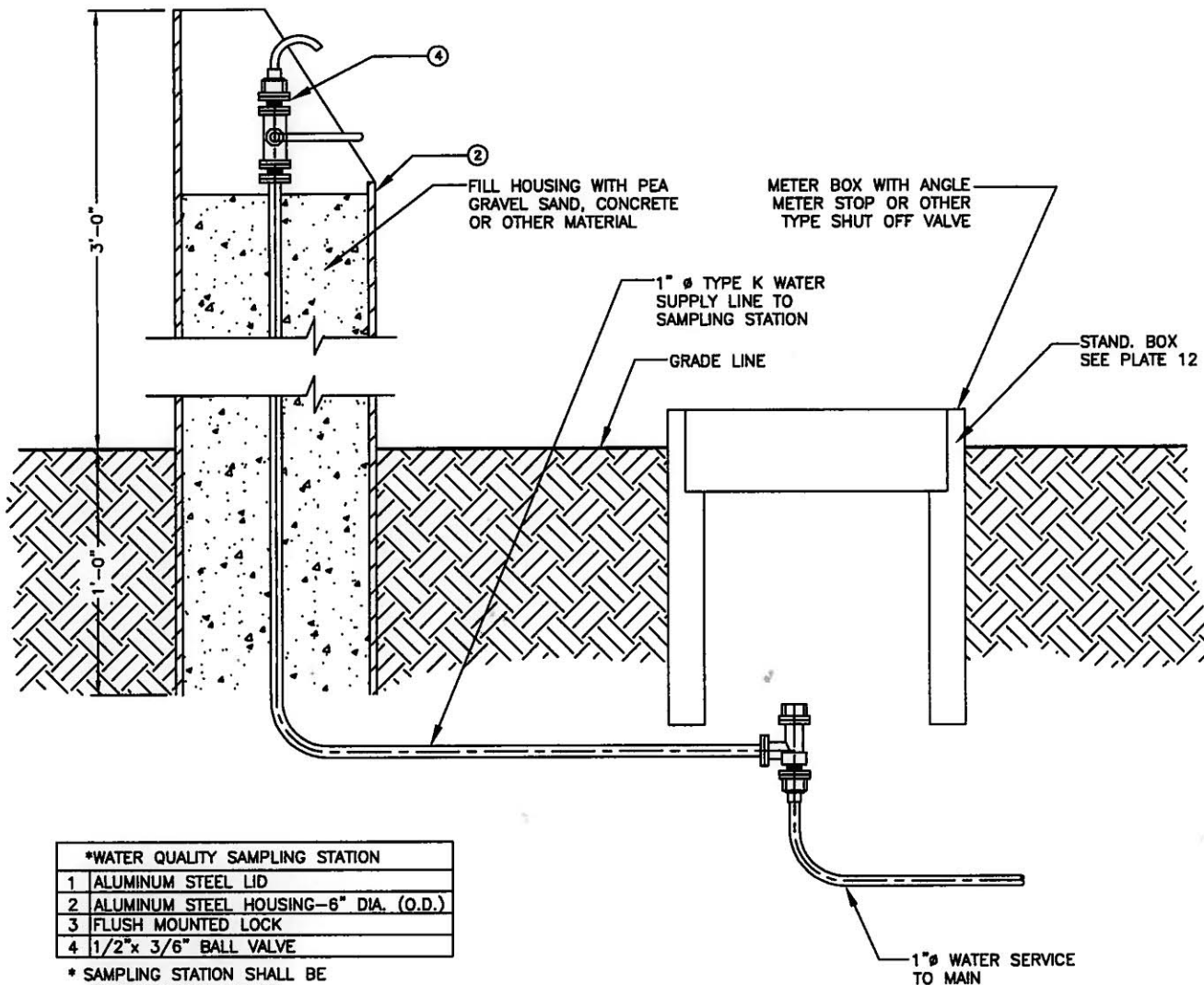
NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			METER BOX INSTALLATION	PLATE 12
	DISTRICT ENGINEER			

FILE: W:\Pasadena Sector\Projects\BCVWD\STANDARDS

NOTE:

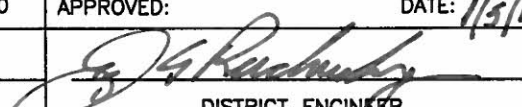
ANGLE STOP 12" FROM CURB OR EDGE OF SIDEWALK.



NOTE:

- 1). TEFLON TAPE SHALL BE USED AT ALL THREADED CONNECTIONS. NO CUTTING - OIL ALLOWED.

NOT TO SCALE

REVISED	PREPARED BY: PARSONS	DATE: 08/06	BEAUMONT CHERRY VALLEY WATER DISTRICT	
12/10	APPROVED:	DATE: 1/5/11		
			TYPICAL INSTALLATION SAMPLING STATION	PLATE 13
	DISTRICT ENGINEER			

FILE: W:\Pasadena Sector\Projects\BCVWD\STANDARDS

APPENDIX A

DIGITAL DATA STANDARDS LANGUAGE FOR DEVELOPER/CONTRACTORS

FEBRUARY 12, 2010

In accordance with the District's request, Parsons has prepared the following language for use as a set of guidelines for all developers and contractors submitting potable and non-potable water facility improvement plan as-built digital spatial data to the District.

The Beaumont Cherry Valley Water District (District) has adopted the use of a Geographic Information System (GIS) to store, manage, and maintain spatial information related to the operation and maintenance of the District's potable and non-potable water facilities. This GIS is based on Environmental Research Systems Institute (ESRI) technology, and is maintained using the ArcGIS suite of software.

The District requires developers and contractors to submit as-built (project record drawings) of installed potable and non-potable water facilities in a format that is consistent with the goal of seamlessly incorporating these data into the new GIS system. Accordingly, all spatial data submitted to the District must comply with the following guidelines:

1. All digital files will be delivered using media approved by the District. Such media include CDROM or DVDROM. Each tract and phase of the tract, if applicable, shall be on one disc. Combining multiple tracts and/or phases on one disc will be returned. The District must approve the use of any alternate media.
2. All submittals will include one mylar set accompanied with an additional hard copy of all "as-built" record plans and drawings. All "as-built" record plans and drawings shall also be provided electronically in PDF format.
3. All spatial data shall be captured and stored using either CAD file formats (AutoCAD .dwg) or ESRI shapefile (.shp) formats. CAD files shall use layers to separate features thematically. Shapefiles will also be divided thematically. For example, parcel boundaries, water lines, meters and services, valves, hydrants, and other potable and non-potable water facilities will all be stored on separate layers, or in separate ArcView shapefiles. This facilitates the import of these data into the GIS. A template that can be imported into ArcGIS will be available on the District's website (www.bcvwd.org).
4. All parcel boundaries and continuous line features must be stored as complete logical entities. For example, pipelines should be represented as solid lines, with no text breaking the continuity of a pipe. The pipeline should snap to the features at each endpoint (e.g. the start of another pipe segment, a valve, a meter, etc.). Similarly, parcel boundaries must be solid lines, snapped closed, and free of other symbology (text, symbols, etc., that break line continuity).
5. A metadata file that describes the development of the spatial data, associated accuracies, use constraints, and contact information shall accompany all submittals.

6. All potable and non-potable water facilities and parcel boundaries shall be in accordance with 2nd Order, Class II survey grade accuracy standards.
7. All coordinates will be referenced to California State Plane coordinates, Zone VI, NAVD88, Epoch Date 2002.00, US Survey Feet. Note that this means that local coordinates are NOT to be used; the AutoCAD or ArcGIS file must store the spatial entities in the native State Plane coordinates.
8. Vertical Datum will be NGVD29 (National Geodetic Vertical Datum 1929) City of Beaumont BM, Adjusted 1982, No. A.05.82
9. All facilities must be separated into two sets of files, potable water facilities and non-potable water facilities. Files that contain both on one layer will be sent back to the developer/contractor for corrections.
10. Attached are the data definitions and supporting information requirements for all facilities installed within the District's service area. This information must accompany the electronic files provided by the developer/contractor in either shapefile format or CAD files accompanied by excel spreadsheets containing the required information. All data dictionary input shall be in columnar format and all feature input in rows.
11. Submittals must be made to and approved by the District Engineer before the District will serve water to any developer or contractor.

Any further questions or clarifications can be obtained by contacting the District, District's Engineer or representative.

Attachment 1 – Data Definition Tables

Layer List

Potable	Non-Potable
Nodes	Nodes
Airvac	Airvac
Blowoff	Blowoff
Fire Hydrant	Fire Hydrant
Fittings	Fittings
Meter	Meter
Pipeline	Pipeline
Airvac Service	Airvac Service
Blowoff Service	Blowoff Service
Distribution Main	Distribution Main
Fire Lateral	Fire Lateral
Service	Service
Valve	Valve
Airvac Iso Valve	Airvac Iso Valve
Blowoff Iso Valve	Blowoff Iso Valve
Distribution Valve	Distribution Valve
Fire Hydrant Iso Valve	Fire Hydrant Iso Valve
Uncommon Features	Uncommon Features
Sample Station	Sample Station
Sample Station Service	Sample Station Service
Pressure Regulating Valve	Pressure Regulating Valve

Nodes				
Airvac	Blowoff	Fire Hydrant	Fittings	Meter
AirvacID	BlowoffID	FireHydID	FittingID	Acct_No
Street_No	Street_No	Street_No	Street	Street_No
Street	Street	Street	Street_Sfx	Street
Street_Sfx	Street_Sfx	Street_Sfx	Fitting_Type	Street_Sfx
Manufact	Outlet	Manufact	Manufact	Size
Model	Manufact	Model	Model	Cust_Type
Size	Model	Outlet	Depth	Conn_Type
Condition	Condition	Condition	YrInstall	YrInstall
YrInstall	YrInstall	YrInstall	PressZone	PressZone
PressZone	PressZone	PressZone	Elevation	Elevation
Elevation	Elevation	Elevation	Notes	Notes
Notes	Notes	Notes		

Pipeline				
Airvac Service	Blowoff Service	Distribution Main	Fire Lateral	Service
AirvacID	BlowoffID	Street	FireHydID	Acct_No
Street_No	Street_No	Street_Sfx	Street_No	Street_No
Street	Street	Diameter	Street	Street
Street_Sfx	Street_Sfx	Pipe_OD	Street_Sfx	Street_Sfx
Diameter	Diameter	Condition	Pipe_OD	Diameter
Condition	Condition	Material	Condition	Condition
Material	Material	Lining	Material	Material
YrInstall	YrInstall	Coating	Lining	Cust_Type
PressZone	PressZone	YrInstall	Coating	YrInstall
Notes	Notes	PressZone	YrInstall	PressZone
		Notes	PressZone	Notes
			Notes	

Valves			
Airvac Iso Valve	Blowoff Iso Valve	Distribution Valve	Fire Hydrant Iso Valve
AirvacID	BlowoffID	DistVlvID	FireHydID
Street_No	Street_No	Street	Street_No
Street	Street	Street_Sfx	Street
Street_Sfx	Street_Sfx	Valve_Type	Street_Sfx
Valve_Type	Valve_Type	Size	Valve_Type
Size	Size	Manufact	Size
Manufact	Manufact	Model	Manufact
Model	Model	Turns	Model
Turns	Turns	Depth	Turns
Depth	Depth	Condition	Depth
Condition	Condition	YrInstall	Condition
YrInstall	YrInstall	PressZone	YrInstall
PressZone	PressZone	Elevation	PressZone
Elevation	Elevation	Notes	Elevation
Notes	Notes		Notes

GIS Detailed Requirements

Nodes

This feature class contains single points of interest within the distribution system. These points do not include valves but do cover airvac, blowoffs, fire hydrants, fittings, and meters. Each feature shall be contained within its own individual feature class using the following naming schedule: (Potable or NonPotable)_Nodes_(Feature Class)_(Tract Number).

Example

Potable_Nodes_Airvac_32100-5

➤ Airvac

- An airvac, as described in Section 2-10, shall be collected at the location of the device.
- Attribute Data
 - AirvacID
 - Developer is to leave this data empty for District input
 - Alias: AirVac ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String

- Width: 10
- Precision: 0
- Scale: 0
- Manufact
 - Description: Manufacture of the device (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the device (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Size
 - Description: Size of the device inlet given in inches (ie, 2, 4, ect.)
 - Alias: Size
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer

- Width: 4
- Precision: 0
- Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Blowoff

- A blowoff, as described in Section 2-09, shall be collected at the location of the device.
- Attribute Data
 - BlowoffID
 - Developer is to leave this data empty for District input
 - Alias: Blowoff ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.).
 - Alias: Street
 - Data Type: String
 - Width: 20

- Precision: 0
- Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Outlet
 - Description: Size of the outlet of the device given in inches (ie. 2, 2.5, 3, ect.).
 - Alias: Size of Outlet
 - Data Type: Double
 - Width: 4
 - Precision: 0
- Manufact
 - Description: Manufacture of the device (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the device (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8

- Precision: 0
- Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Fire_Hydrant

- A fire hydrant, as described in Section 2-08, shall be collected at the location of the device.
- Attribute Data
 - FirehydID
 - Developer is to leave this data empty for District input
 - Alias: Fire Hydrant ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0

- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.).
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Outlets
 - Description: Size of the outlet of the device given in inches (ie. 4" x 2½", 4"x 2-2½", ect.).
 - Alias: Size of Outlets
 - Data Type: String
 - Width: 30
 - Precision: 0
- Manufact
 - Description: Manufacture of the device (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the device (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0

- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Fittings

- A fitting is a feature used to create a change in the velocity or direction of the flow. These features are usually tees and elbows but can be flex couplings or other features that may not belong to a category. Tees for fire hydrant laterals should not be included. These features shall be collected at the location of the device.
- Attribute Data
 - FittingID
 - Developer is to leave this data empty for District input
 - Alias: Fitting ID
 - Data Type: String

- Width: 8
- Precision: 0
- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.).
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Fitting_Type
 - Description: Type of fitting (ie. Tee, 90 ell, ect.)
 - Alias: Fitting Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Depth
 - Description: Depth of the fitting from the surface to the top of the fitting in feet (ie. 8.0, 7.3, ect.). If the fitting is above ground it should be noted in the Notes section.
 - Alias: Model
 - Data Type: Double
 - Width: 15
 - Precision: 0
 - Scale: 0
- Manufact
 - Description: Manufacture of the device (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition

- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Meter

- A meter is any point of delivery to a consumer and is not dependant upon the installation of an actual meter, shall be collected at the location of the device.
- Attribute Data
 - Acct_No.
 - Developer is to leave this data empty for District input
 - Alias: Account Number
 - Data Type: Integer
 - Width: 4

- Precision: 0
- Scale: 0
- Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.).
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Size
 - Description: The size of the connection, such as the meter stop diameter in inches (ie. 1, 2, ect.).
 - Alias: Size of Meter Connection
 - Data Type: Single
 - Width: 4
 - Precision: 0
- Cust_Type
 - Description: Intent of the service (ie. residential , irrigation, ect.).
 - Alias: Consumer Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Conn_Type
 - Description: Type of connection to service (ie. threaded, flanged, ect.).
 - Alias: Connection Type
 - Data Type: String
 - Width: 20

- Precision: 0
- Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

This feature class contains line features including airvac services, blowoff services, distribution mains, fire laterals, and services. Each feature shall be contained within its own individual feature class using the following naming schedule: (Potable or NonPotable)_Pipeline_(Feature Class)_(Tract Number).

Example

NonPotable_Pipeline_Distribution_Main_32100-5

➤ Airvac_Service

- An airvac service is described as the lateral that services an airvac. A single line should properly represent the placement of each service.
- Attribute Data
 - AirvacID
 - Developer is to leave this data empty for District input
 - Alias: AirVac ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Diameter
 - Description: General diameter of the pipe given in inches (ie. 1, 2, ect.).

- Alias: Diameter
- Data Type: Single
- Width: 4
- Precision: 0
- Scale: 0
- Material
 - Description: Material the pipe is made of (ie. copper, poly, ect.).
 - Alias: Material
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of pipe (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Blowoff_Service

- A blowoff service is described as the lateral that services a blowoff. A single line should properly represent the placement of each service.
- Attribute Data
 - BlowoffID
 - Developer is to leave this data empty for District input
 - Alias: Blowoff ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Diameter
 - Description: General diameter of the pipe given in inches (ie. 1, 2, ect.).
 - Alias: Diameter
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
 - Material
 - Description: Material the pipe is made of (ie. copper, poly, ect.).
 - Alias: Material

- Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Condition
 - Description: Condition of pipe (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
 - PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
 - Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0
- Distribution_Main
- A distribution main is described as the any pipeline not used for a specific service. A single line should properly represent the placement of each main. The main should go from fitting to fitting. A main should never go through a fitting or end without a fitting.
 - Attribute Data
 - MainID
 - Developer is to leave this data empty for District input
 - Alias: Main ID

- Data Type: String
- Width: 8
- Precision: 0
- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Diameter
 - Description: General diameter of the pipe given in inches (ie. 1, 2, ect.).
 - Alias: Diameter
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Pipe_OD
 - Description: Outside diameter of the pipeline given in inches (ie. 9.05, 13.20, ect.).
 - Alias: Pipe OD
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Material
 - Description: Material the pipe is made of (ie. copper, poly, ect.).
 - Alias: Material
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Lining
 - Description: Material type used for the lining of the pipeline (ie. concrete, none, ect.).

- Alias: Lining
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0
- Coating
 - Description: Material type used for the coating of the pipeline (ie. bituminous, none, ect.).
 - Alias: Coating
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of pipe (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Fire_Lateral

- A fire lateral is described as the any pipeline used to connect a fire hydrant to a main. A single line should properly represent the placement of each fire lateral. The lateral should go from fitting to the fire hydrant.
- Attribute Data
 - FirehydID
 - Developer is to leave this data empty for District input
 - Alias: Fire Hydrant ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Diameter
 - Description: General diameter of the pipe given in inches (ie. 1, 2, ect.).
 - Alias: Diameter
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
 - Pipe_OD
 - Description: Outside diameter of the pipeline given in inches (ie. 9.05, 13.20, ect.).
 - Alias: Pipe OD
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
 - Material

- Description: Material the pipe is made of (ie. copper, poly, ect.).
- Alias: Material
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0
- Lining
 - Description: Material type used for the lining of the pipeline (ie. concrete, none, ect.).
 - Alias: Lining
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Coating
 - Description: Material type used for the coating of the pipeline (ie. bituminous, none, ect.).
 - Alias: Coating
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of pipe (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0

- Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

➤ Service

- A service is described as the lateral that services a meter. A single line should properly represent the placement of each service.
- Attribute Data
 - Acct_No
 - Developer is to leave this data empty for District input
 - Alias: Account No
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0

- Diameter
 - Description: General diameter of the pipe given in inches (ie. 1, 2, ect.).
 - Alias: Diameter
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Material
 - Description: Material the pipe is made of (ie. copper, poly, ect.).
 - Alias: Material
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Cust_Type
 - Description: Intent of the service (ie. residential, irrigation, fire, ect.).
 - Alias: Consumer Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of pipe (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4

- Precision: 0
- Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

Valves

This feature class contains point features including airvac isolation valves, blowoff isolation valves, distribution valves, and fire lateral valves. Each feature shall be contained within its own individual feature class using the following naming schedule: (Potable or NonPotable)_Valves_(Feature Class)_(Tract Number).

Example

Potable_Valves_Blowoff_Valve_32100-5

➤ Airvac_Valve

- An airvac valve is described as an isolation valve that controls the entire lateral and device. A single point should properly represent the placement of each airvac isolation valve.
- Attribute Data
 - AirvacID
 - Developer is to leave this data empty for District input
 - Alias: Airvac ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String

- Width: 20
- Precision: 0
- Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Valve_Type
 - Description: Type of valve (ie. gate, butterfly, ect.).
 - Alias: Valve Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Flange_Type
 - Description: Type of flange on valve (ie. flange, MJ, ect.).
 - Alias: Flange Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Size
 - Description: Size of valve in inches (ie. 6, 12, ect.).
 - Alias: Size
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Manufact
 - Description: Manufacture of the valve (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the valve (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0

- Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Depth
 - Description: Depth from the surface to the top of the operating nut in feet (ie. 4.5, 6.7, ect.).
 - Alias: Depth
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Turns
 - Description: Number of turns it takes to fully close the valve from an open position.
 - Alias: Turns
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation

- Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
 - Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0
- Blowoff_Valve
- A blowoff valve is described as an isolation valve that controls the entire lateral and device. A single point should properly represent the placement of each blowoff isolation valve.
 - Attribute Data
 - BlowoffID
 - Developer is to leave this data empty for District input
 - Alias: Blowoff ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No
 - Description: Street address number for the location of the feature (ie. 560).
 - Alias: House No.
 - Data Type: Integer
 - Width: 10
 - Precision: 0
 - Scale: 0
 - Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
 - Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String

- Width: 10
- Precision: 0
- Scale: 0
- Valve_Type
 - Description: Type of valve (ie. gate, butterfly, ect.).
 - Alias: Valve Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Flange_Type
 - Description: Type of flange on valve (ie. flange, MJ, ect.).
 - Alias: Flange Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Size
 - Description: Size of valve in inches (ie. 6, 12, ect.).
 - Alias: Size
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Manufact
 - Description: Manufacture of the valve (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the valve (ie. AB-307, 65849, ect.).
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0

- Scale: 0
- Depth
 - Description: Depth from the surface to the top of the operating nut in feet (ie. 4.5, 6.7, ect.).
 - Alias: Depth
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Turns
 - Description: Number of turns it takes to fully close the valve from an open position.
 - Alias: Turns
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes

- Data Type: String
- Width: 255
- Precision: 0
- Scale: 0

➤ Distribution_Valve

- A distribution valve is described as a valve that controls a section of main. A single point should properly represent the placement of each distribution valve.
- Attribute Data

- DistVlvID

- Developer is to leave this data empty for District input
- Alias: Valve ID
- Data Type: String
- Width: 8
- Precision: 0
- Scale: 0

- Street

- Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
- Alias: Street
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0

- Street_Sfx

- Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
- Alias: Street Suffix
- Data Type: String
- Width: 10
- Precision: 0
- Scale: 0

- Valve_Type

- Description: Type of valve (ie. gate, butterfly, ect.).
- Alias: Valve Type
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0

- Flange_Type

- Description: Type of flange on valve (ie. flange, MJ, ect.).
- Alias: Flange Type
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0

- Size
 - Description: Size of valve in inches (ie. 6, 12, ect.).
 - Alias: Size
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Manufact
 - Description: Manufacture of the valve (ie. Muller, Crispin, ect.).
 - Alias: Manufacture
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Model
 - Description: Model number of the valve (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Depth
 - Description: Depth from the surface to the top of the operating nut in feet (ie. 4.5, 6.7, ect.).
 - Alias: Depth
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Turns
 - Description: Number of turns it takes to fully close the valve from an open position.
 - Alias: Turns
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- YrInstall

- Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
 - PressZone
 - Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
 - Alias: Pressure Zone
 - Data Type: Small Integer
 - Width: 4
 - Precision: 0
 - Scale: 0
 - Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
 - Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0
- Fire_Hydrant_Valve
- A fire hydrant valve is described as an isolation valve that controls the entire lateral and device. A single point should properly represent the placement of each fire hydrant isolation valve.
 - Attribute Data
 - FirehydID
 - Developer is to leave this data empty for District input
 - Alias: Fire Hydrant ID
 - Data Type: String
 - Width: 8
 - Precision: 0
 - Scale: 0
 - Street_No

- Description: Street address number for the location of the feature (ie. 560).
- Alias: House No.
- Data Type: Integer
- Width: 10
- Precision: 0
- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Valve_Type
 - Description: Type of valve (ie. gate, butterfly, ect.).
 - Alias: Valve Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Flange_Type
 - Description: Type of flange on valve (ie. flange, MJ, ect.).
 - Alias: Flange Type
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Size
 - Description: Size of valve in inches (ie. 6, 12, ect.).
 - Alias: Size
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Manufact
 - Description: Manufacture of the valve (ie. Muller, Crispin, ect.).

- Alias: Manufacture
- Data Type: String
- Width: 20
- Precision: 0
- Scale: 0
- Model
 - Description: Model number of the valve (ie. AB-307, 65849, ect.)
 - Alias: Model
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Condition
 - Description: Condition of device (ie. Good, Fair, Poor, Needs Replacement).
 - Alias: Condition
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Depth
 - Description: Depth from the surface to the top of the operating nut in feet (ie. 4.5, 6.7, ect.).
 - Alias: Depth
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- Turns
 - Description: Number of turns it takes to fully close the valve from an open position.
 - Alias: Turns
 - Data Type: Single
 - Width: 4
 - Precision: 0
 - Scale: 0
- YrInstall
 - Description: Date of the installation of the device (ie. 2009, 2010, ect.). If actual day is unknown then the date of January 1st of the given year shall be used.
 - Alias: Date of Installation
 - Data Type: Date
 - Width: 8
 - Precision: 0
 - Scale: 0
- PressZone

- Description: Pressure zone in which the device is located (ie. 2750, 2650, ect.).
- Alias: Pressure Zone
- Data Type: Small Integer
- Width: 4
- Precision: 0
- Scale: 0
- Elevation
 - Description: Elevation of the device in feet above MSL (ie. 2654.7, 2557.0, ect.).
 - Alias: Elevation
 - Data Type: Double
 - Width: 6
 - Precision: 0
 - Scale: 0
- Notes
 - Description: This section is reserved for any notes regarding the device.
 - Alias: Notes
 - Data Type: String
 - Width: 255
 - Precision: 0
 - Scale: 0

Parcel Data (Tract Maps Submittal)

This feature class is a polygon data set of all properties within the project. Each parcel must have the address or APN, lot number and tract number within its attribute data. The name of the feature class shall be named using the name “Parcels_(tract number).”

Example

Parcels_32100-5

➤ Parcels

○ Attribute Data

▪ APN

- Assessors Parcel Number
- Alias: APN
- Data Type: long
- Width: 15
- Precision: 0
- Scale: 0

▪ Street_No

- Description: Street address number for the location of the feature (ie. 560).
- Alias: House No.

- Data Type: Integer
- Width: 10
- Precision: 0
- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Tract
 - Tract number
 - Alias: Tract
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0
- Lot
 - Lot number of each parcel
 - Alias: Tract
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0

Street Centerline Data (Tract Maps Submittal)

This feature class is a line data set of all street center lines within the project. Each centerline must have the official street name as recorded by the county in its attribute data. The name of the feature class shall be named using the name “Streets_(tract number).”

Example

Streets_32100-5

- Streets
 - Attribute Data
 - Street_No

- Description: Street address number for the location of the feature (ie. 560).
- Alias: House No.
- Data Type: Integer
- Width: 10
- Precision: 0
- Scale: 0
- Street
 - Description: Street for the location of the feature (ie. Magnolia, Main, ect.)
 - Alias: Street
 - Data Type: String
 - Width: 20
 - Precision: 0
 - Scale: 0
- Street_Sfx
 - Description: Street suffix for the location of the feature (ie. Ave, St, ect.). Do not include periods
 - Alias: Street Suffix
 - Data Type: String
 - Width: 10
 - Precision: 0
 - Scale: 0
- Tract
 - Tract number
 - Alias: Tract
 - Data Type: String
 - Width: 15
 - Precision: 0
 - Scale: 0

APPENDIX B

SUPPLEMENTAL REQUIREMENTS

Beaumont Cherry Valley Water District (District) is providing the following guidelines to assist the installation Contractor in the construction and activation of District water.

Prior to start of any work, the Contractor shall have approved water improvement plans on hand and available for review at the jobsite. In addition, all Facility Construction Agreements shall be executed and all Facility Fees and deposits paid prior to start of any work.

All work shall be performed in accordance with approved plans and District Standard Specifications. The District's authorized representative shall review and approve any field changes required that involve the relocation of any appurtenance, lateral, hydrant, water service, etc. more than one foot from locations as shown on the drawings.

In the event that any facility relocation as discussed above is required, the new location of the facility shall be indicated on the Contractor's field record drawings and/or intersection plate.

Temporary construction water meters are available from the District. These meters will require the Developer/Contractor make application at the District offices and pay all the required deposits/fees. These meters will be the only units available for the delivery of water prior to the approval and acceptance on the facility.

The final, permanent water meters shall be installed after all grading, trenching and landscaping has been completed. All necessary meter deposits/fees shall be paid prior to installation of any permanent water meters.

Angle meter stops shall be installed in accordance with District Plate No. 6-2 of the Standard Specifications.

Prior to meter installation, per District Plate No. 12, an area of 1 ft x 4 ft shall be excavated to accommodate the meter box appurtenance.

Developer/Contractor shall be responsible for the procurement and installation of the meter boxes and the gate valve boxes, two separate items. The meter box shall have a lid, which locks in place that cannot be opened with a common tool. The District will provide the name of the approved manufacturer and model number for the meter box.

The District will not install permanent water meters prior to the submittal, review and approval of the record "as-built" drawings and intersection plates prepared by the Developer/Contractor.

APPENDIX C

Memorandum

Date: April 14, 2003 (**Revised Date:** October 16, 2003)

To: Regional and District Engineers

From: David P. Spath, Ph.D., Chief (*Original signed by Dave*)
Drinking Water and Environmental Management
601 North 7th Street, MS 216
Sacramento, CA 95814
(916) 322-2308

Subject: **GUIDANCE MEMO NO. 2003-02: GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES**

The purpose of this memo is to update guidance dated April 5, 1983 for consistency with proposed 2003 regulations. Should there be any modification to the proposed Water Works Standards that may impact the content of this guidance, the guidance will be amended accordingly.

GUIDANCE: CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES

BACKGROUND

When buried water mains are in close proximity to non-potable pipelines, the water mains are vulnerable to contamination that can pose a risk of waterborne disease outbreaks. For example, sewers (sanitary sewer mains and sewage force mains) frequently leak and saturate the surrounding soil with sewage due to structural failure, improperly constructed joints, and/or subsidence or upheaval of the soil encasing the sewer. If a nearby water main is depressurized and no pressure or negative pressure occurs, that situation is a public health hazard that is compounded if an existing sewer is broken during the installation or repair of the water main. Further, failure of a water main in close proximity to other pipelines may disturb their bedding and cause them to fail. In the event of an earthquake or other disaster, simultaneous failure of all pipelines could occur.

The most effective protection against this type of drinking water contamination is adequate construction and separation of non-potable pipelines and water mains. The Waterworks Standards (Title 22, Chapter 16, Section 64572) provide separation criteria for new construction. However, when these criteria cannot be met, the risk of contamination can be reduced by increasing the structural integrity of pipe materials and joints, and ensuring minimum separation requirements are met. Therefore, the following guidance details construction criteria for the installation of water mains and non-potable pipelines to minimize the risk of contamination of drinking water.



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www.consumerenergycenter.org/flex/index.html

January 2011

DEFINITIONS

- **COMPRESSION JOINT** - A push-on joint that seals by means of the compression of a rubber ring or gasket between the pipe and a bell or coupling.
- **CONTINUOUS SLEEVE** - A protective tube of high-density-polyethylene (HDPE) pipe with heat fusion joints or other non-potable metallic casing without joints into which a pipe is inserted.
- **DISINFECTED TERTIARY RECYCLED WATER** - Wastewater that has been filtered and subsequently disinfected in accordance with Section 60301.230, Chapter 3 (Water Recycling Criteria), Title 22, California Code of Regulations.
- **HOUSE LATERAL** - A sewer line connecting the building drain and the sanitary sewer main serving the street.
- **SUPPLY LINE** - Pipelines conveying raw water to be treated for drinking purposes in accordance with Section 64572 ©, proposed Water Works Standards.
- **WATER MAIN** – Means any pipeline, except for user service lines, within the distribution system in accordance with Section 64551.70, proposed Water Works Standards.
- **RATED WORKING WATER PRESSURE** - A pipe classification system based on internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.
- **SANITARY SEWER MAIN** - A gravity sewer conveying untreated municipal wastewater.
- **SEWAGE FORCE MAIN** - A pressurized sewer conveying untreated municipal wastewater.

APPLICABILITY

Note that the construction criteria presented in this document apply to house laterals that cross above a water main, but not to those house laterals that cross below a water main.

Water mains or non-potable pipelines that are 24-inches in diameter or larger may pose a higher degree of public health concern because of the large volumes of flow involved. Therefore, installation of water mains or non-potable pipelines 24-inches in diameter or larger should be reviewed and approved in writing by the Department on a case-by-case basis prior to construction.

In no case, should water mains and non-potable pipelines conveying sewage or other liquids be installed in the same trench.

REGULATORY REQUIREMENTS

Any new development project in which all the underground facilities are being constructed for the first time must comply with the following regulatory requirements:

Existing requirements:

Section 64630. (Title 22 CA Code of Regulations) Water Main Installation"

(c) Water mains shall be installed at least:

- (1) Ten feet (3 meters) horizontally from and 1 foot (0.3 meters) higher than sanitary sewer mains located parallel to the main.
- (2) One foot (0.3 meters) higher than sanitary sewer mains crossing the main.
- (3) Ten feet (3 meters), and preferably 25 feet (7.5 meters), horizontally from sewage leach fields, cesspools, seepage pits and septic tanks.

(d) Separation distances specified in (c) shall be measured from the nearest outside edges of the facilities.

(e) Where the requirements of (c) and (d) cannot be met due to topography, inadequate right-of-way easements, or conflicts with other provisions of these regulations, lesser separation is permissible if:

- (1) The water main and the sewer are located as far apart as feasible within the conditions listed above.
- (2) The water main and the sewer are not installed within the same trench.
- (3) The water main is appropriately constructed to prevent contamination of the water in the main by sewer leakage.

(f) Water mains shall be disinfected according to AWWA Standard C601-81 before being placed in service.

(g) Installation of water mains near the following sources of potential contamination shall be subject to written approval by the Department on a case-by-case basis:

- (1) Storage ponds or land disposal sites for wastewater or industrial process water containing toxic materials or pathogenic organisms.
- (2) Solid waste disposal sites.
- (3) Facilities such as storage tanks and pipe mains where malfunction of the facility would subject the water in the main to toxic or pathogenic contamination.

Although the following requirements have not yet been adopted, they should be within the next two years and should be used as guidance for future construction.

Proposed requirements as of the date of this document:**Section 64572. Water Main Separation**

(a) New water mains and new supply lines shall not be installed in the same trench as, and shall be at least 10 feet horizontally from, and one foot vertically above, any parallel pipeline conveying:

- (1) Untreated sewage,
- (2) Primary or secondary treated sewage,
- (3) Disinfected secondary-2.2 recycled water (defined in section 60301.220),
- (4) Disinfected secondary-23 recycled water (defined in section 60301.225), and
- (5) Hazardous fluids such as fuels, industrial wastes, and wastewater sludge.

(b) New water mains and new supply lines shall be installed at least 4 feet horizontally from, and one foot vertically above, any parallel pipeline conveying:

- (1) Disinfected tertiary recycled water (defined in section 60301.230), and
- (2) Storm drainage.

(c) New supply lines conveying raw water to be treated for drinking purposes shall be installed at least 4 feet horizontally from, and one foot vertically below, any water main.

(d) If crossing a pipeline conveying a fluid listed in subsection (a) or (b), a new water main shall be constructed perpendicular to and at least one foot above that pipeline. No connection joints shall be made in the water main within eight horizontal feet of fluid pipeline.

(e) The vertical separation specified in subsections (a), (b), and (c) is required only when the horizontal distance between a water main and pipeline is ten feet or less.

(f) New water mains shall not be installed within 100 horizontal feet of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 feet of any cesspool, septic tank, sewage leach field, seepage pit, or groundwater recharge project site.

(g) The minimum separation distances set forth in this section shall be measured from the nearest outside edge of each pipe barrel.

ALTERNATIVE CRITERIA FOR CONSTRUCTION**Water Mains, and Sewers and Other Non-potable Fluid-carrying Pipelines**

When new water mains, new sanitary sewer mains, or other non-potable fluid-carrying pipelines are being installed in existing developed areas, local conditions (e.g., available space, limited slope, existing structures) may create a situation in which there is no alternative but to install water mains, sanitary sewer mains, or other non-potable pipelines at a distance less than that required by the regulations [existing Section 64630 (proposed Section 64572)]. In such cases, through permit action, the Department may approve

alternative construction criteria. The alternative approach is allowed under the proposed regulation Section 64551(c):

"A water system that proposes to use an alternative to the requirements in this chapter shall demonstrate to the Department how it will institute additional mitigation measures to ensure that the proposed alternative would not result in an increased risk to public health."

Appropriate alternative construction criteria for two different cases in which the regulatory criteria for sanitary sewer main and water main separation cannot be met are shown in Figures 1 and 2.

- **Case 1** - New sanitary sewer main and a new or existing water main; alternative construction criteria apply to the sanitary sewer main.
- **Case 2** - New water main and an existing sanitary sewer main; alternative construction criteria may apply to either or both the water main and sanitary sewer main.

Case 1: New Sanitary Sewer Main Installation (Figures 1 and 2)

Zone Special Construction Required for Sanitary Sewer Main

- A** Sanitary sewer mains parallel to water mains shall not be permitted in this zone without prior written approval from the Department and public water system.
- B** If the water main paralleling the sanitary sewer main does not meet the Case 2 Zone B requirements, the sanitary sewer main should be constructed of one of the following:
1. High-density-polyethylene (HDPE) pipe with fusion welded joints (per AWWA C906-99);
 2. Spirally-reinforced HDPE pipe with gasketed joints (per ASTM F-894);
 3. Extra strength vitrified clay pipe with compression joints;
 4. Class 4000, Type II, asbestos-cement pipe with rubber gasket joints;
 5. PVC sewer pipe with rubber ring joints (per ASTM D3034) or equivalent;
 6. Cast or ductile iron pipe with compression joints; or
 7. Reinforced concrete pressure pipe with compression joints (per AWWA C302-95).

- C If the water main crossing below the sanitary sewer main does not meet the requirements for Case 2 Zone C, the sanitary sewer main should have no joints within ten feet from either side of the water main (in Zone C) and should be constructed of one of the following:
1. A continuous section of ductile iron pipe with hot dip bituminous coating; or
 2. One of the Zone D options 1, 3, 4, or 5 below.
- D If the water main crossing above the sanitary sewer main does not meet the Case 2 Zone D requirements, the sanitary sewer main should have no joints within four feet from either side of the water main (in Zone D) and be constructed of one of the following:
1. HDPE pipe with fusion-welded joints (per AWWA C906-99);
 2. Ductile iron pipe with hot dip bituminous coating and mechanical joints (gasketed, bolted joints);
 3. A continuous section of Class 200 (DR 14 per AWWA C900-97) PVC pipe or equivalent, centered over the pipe being crossed;
 4. A continuous section of reinforced concrete pressure pipe (per AWWA C302-95) centered over the pipe being crossed; or
 5. Any sanitary sewer main within a continuous sleeve.

Case 2: New water mains Installation (Figures 1 and 2)

Zone Special Construction Required for Water Main

- A No water mains parallel to sanitary sewer mains shall be constructed without prior written approval from the Department.
- B If the sanitary sewer main paralleling the water main does not meet the Case 1 Zone B requirements, the water main should be constructed of one of the following:
1. HDPE pipe with fusion welded joints (per AWWA C906-99);
 2. Ductile iron pipe with hot dip bituminous coating;
 3. Dipped and wrapped one-fourth-inch-thick welded steel pipe;
 4. Class 200, Type II, asbestos-cement pressure pipe;

5. Class 200 pressure rated PVC water pipe (DR 14 per AWWA C900-97 & C905-97) or equivalent; or
 6. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-97 or C302-99 or C303-95).
- C If the sanitary sewer main crossing above the water main does not meet the Case 1 Zone C requirements, the water main should have no joints within ten feet from either side of the sanitary sewer main (in Zone C) and be constructed of one of the following:
1. HDPE pipe with fusion-welded joints (per AWWA C906-99);
 2. Ductile iron pipe with hot dip bituminous coating;
 3. Dipped and wrapped one-fourth-inch-thick welded steel pipe;
 4. Class 200 pressure rated PVC water pipe (DR 14 per AWWA C900-97 & C905-97); or
 5. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-97 or C301-99 or C303-95).
- D If the sanitary sewer main crossing below the water main does not meet the requirements for Case 1 Zone D, the water main should have no joints within eight feet from either side of the sanitary sewer main (in Zone D) and should be constructed as for Zone C.

Water Mains and Pipelines Conveying Non-potable Fluids

When the basic separation criteria cannot be met between water mains and pipelines conveying non-potable fluids, the requirements described above for sanitary sewer mains should apply. This includes the requirements for selecting special construction materials and the separation requirements shown in Figures 1 and 2. Note that not all construction materials allowed for sanitary sewer mains will be appropriate for other non-potable fluid lines. For example, certain plastic lines may not be appropriate for the transport of some fuel products. The selection of compatible materials of construction for non-potable fluids is a decision to be made by the project engineer.

Water Mains and Sewage Force Mains

- Sewage force mains shall not be installed within ten feet (horizontally) of a water main.

- When a sewage force main must cross a water main, the crossing should be as close as practical to the perpendicular. The sewage force main should be at least one foot below the water main.
- When a new sewage force main crosses under an existing water main, and a one-foot vertical separation cannot be provided, all portions of the sewage force main within eight feet (horizontally) of the outside walls of the water main should be enclosed in a continuous sleeve. In these cases, a minimum vertical separation distance of 4 inches should be maintained between the outside edge of the bottom of the water main and the top of the continuous sleeve.
- When a new water main crosses over an existing sewage force main, the water main should be constructed of pipe materials with a minimum rated working pressure of 200 psig or the equivalent.

Water Mains and Tertiary Treated Recycled Water or Storm Drainage

The basic separation criteria for water mains and pipelines conveying tertiary treated recycled water or storm drainage lines are a 4-foot horizontal separation where lines are running parallel and a 1-foot vertical separation (water line above recycled or storm drainage) where the lines cross each other.

When these criteria cannot be met, the Zone A criteria apply where lines are running parallel, and the Zone C and Zone D criteria apply where the lines cross each other as shown on Figures 1 and 2. For these situations, the Zone "P" criteria are in effect and prohibit construction less than 1 foot in parallel installations and less than 4 inches in vertical (crossing) situations.

For tertiary treated recycled water and storm drainage lines, the Zone B criteria (requirements for special pipe) do not apply as the basic separation criteria is a four-foot horizontal separation criteria for parallel lines. The tertiary treated recycled water lines should be constructed in accordance with the color-coding, and labeling requirements per Section 116815, California Health and Safety Code of Regulations.

MISCELLANEOUS GUIDANCE

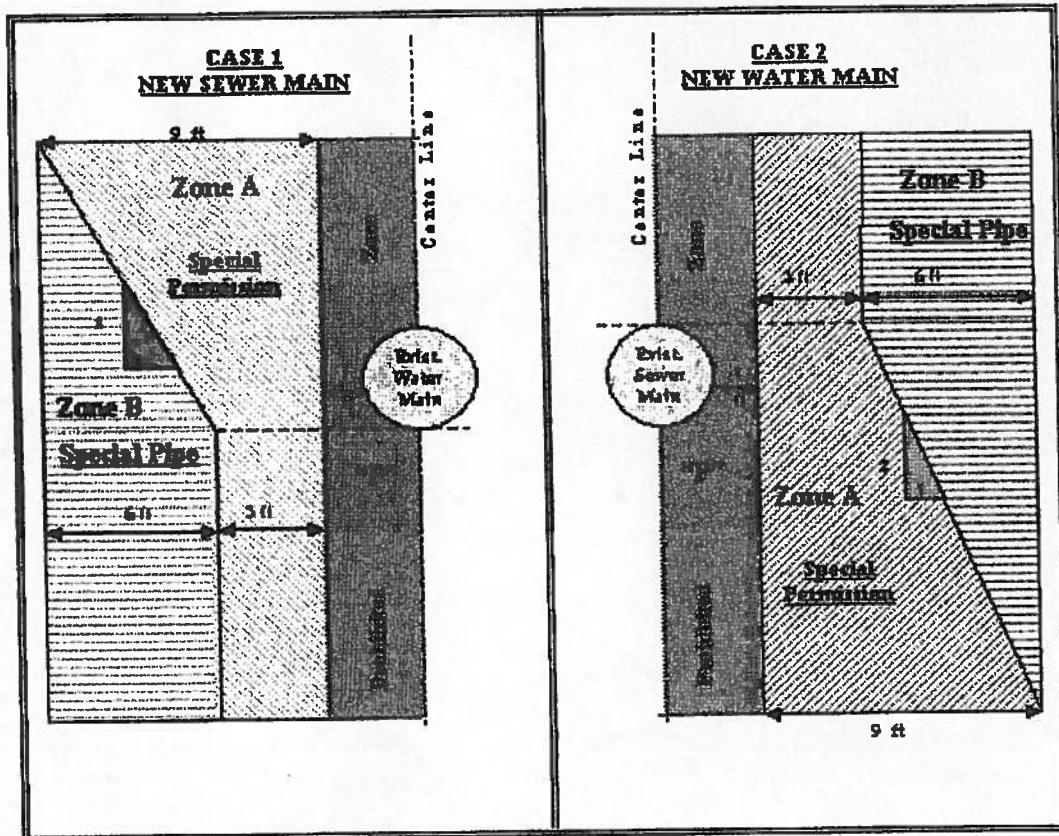
- More stringent requirements may be necessary if conditions such as high groundwater exist. HDPE or similar pipe may be required to provide flexibility to move without potential joint leaks.
- Sanitary sewer mains should not be installed within 25 feet horizontally of a low head (5 psig or less pressure) water main.
- New water mains and sanitary sewer mains should be pressure tested in accordance with manufacturer's specifications.

- When installing water mains, sewers, or other pipelines, measures should be taken to prevent or minimize disturbances of existing pipelines. Disturbance of the conduit's supporting base could eventually result in pipeline failure.
- Special consideration should be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the conduit, such as a septic sewage producing corrosive hydrogen sulfide.

NOTE: Dimensions are from the outside of the water main to the outside of the other pipeline, manhole, or sleeve.

FIGURE 1 PARALLEL CONSTRUCTION

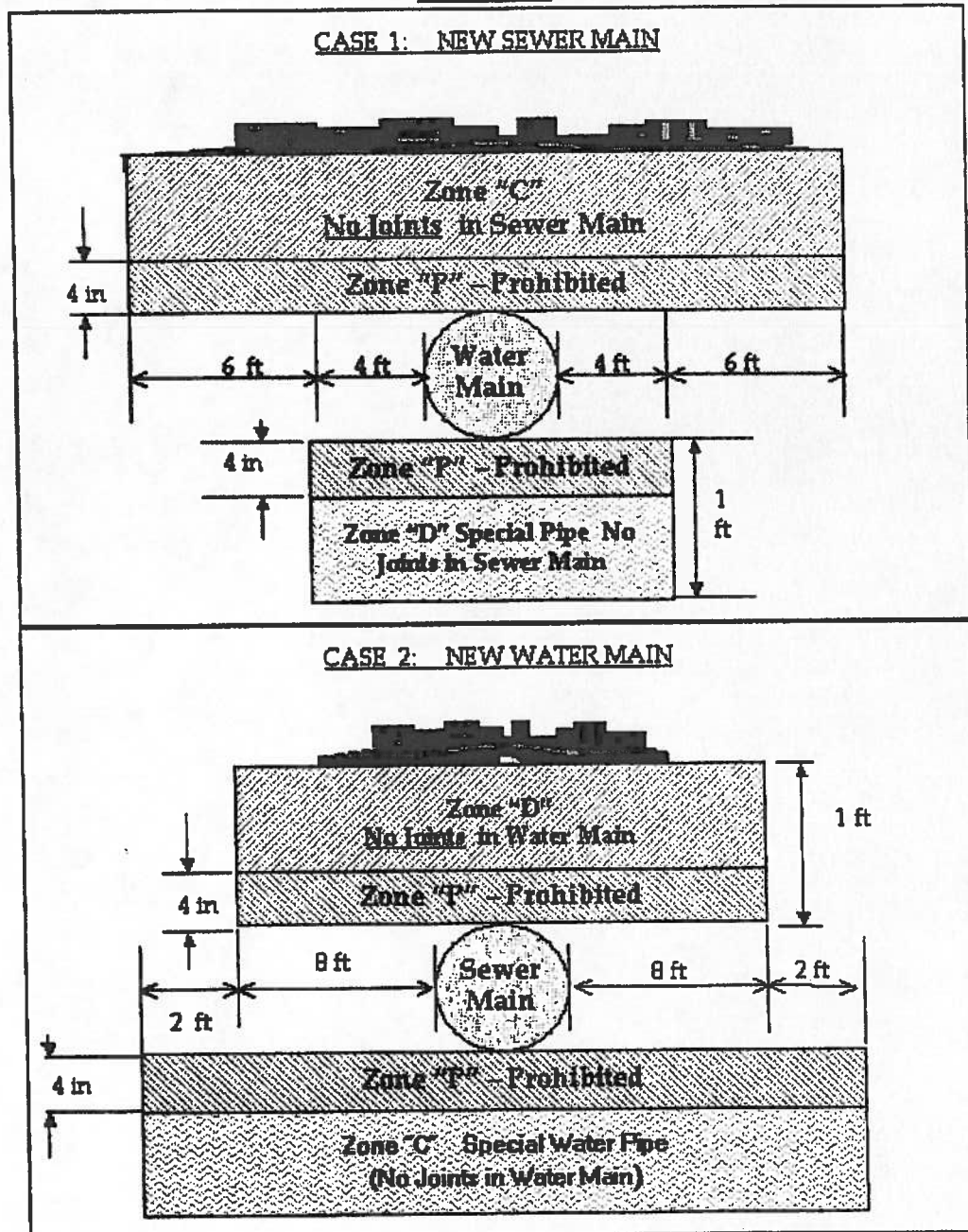
Not To Scale



Note: Zones identical on either side of center lines.

Zones "P" is a prohibited zone. Section 64630 (a) (2) California Code of Regulations, Title 22 (Current); or Section 64572 (a) California Code of Regulations, Title 22 (Proposed).

FIGURE 2 CROSSINGS
Not To Scale



APPENDIX D

BEAUMONT CHERRY VALLEY WATER DISTRICT

PLAN CHECKING GUIDELINES

1. Verify general notes, construction notes and quantities. Need typical street sections indicating location of underground utilities, pavement marker details for fire hydrants, pipeline intersection details, lot service details and with fire hydrant, and typical details.
2. Provide vicinity map and location map. Provide abbreviations and symbol legend, and description of index of sheets. Provide Private Engineer's Notice to Contractors, District Engineer's Certificate, Applicant's Engineer Certificate, County Fire Department approval block, Description of benchmark and basis of bearings.
3. Provide drawing sheet index list w/station limits that agree with each sheet's title block and plan and profile match points.
4. Index map shall show tract lot numbers. Circle highest lot number.
5. Show all pipe crossings in profile.
6. Show all storm drains, sewers, and recycled water lines to be installed parallel to proposed water line in profile as "shadow" dashed lines and label.
7. Verify right-of-way (R/W) is called out.
8. Verify water meters 4' minimum from property lines.
9. Verify fire hydrants on property line.
10. Verify air vacuum release valves on property line.
11. Verify blowoffs on property line.
12. Verify drains on property line.
13. Verify that air vacuum release valves are installed at all high points, drains at all low points and blowoffs or fire hydrants less than 30' from end of line.
14. Show street dimensions and water line locations.
15. Provide stations for road centerline intersections, pipe crossovers and water line intersections.
16. Provide curve data for water line – only on plan view. Indicate BC, EC, PRC, and PCC on plan view. Make sure surveyor can stake line.
17. Indicate bearing along straight segments of pipeline or include in pipe data table.
18. Place fire hydrants on short side, on property lines, call out on plan and profile, indicate stations, verify agreement in plan and profile, and indicate pavement markers.
19. Verify vertical and horizontal match up at pipe intersections and road centerlines from sheet-to-sheet.
20. Make sure pipe callouts [LF, pipe material, pressure class] are in profiles.

21. Each sheet shall show north arrow. Indicate horizontal scale in plan and horizontal and vertical scale in profile.
22. Verify circled construction note callouts (®) pertain to sheet. Check spelling and grammar.
23. BCVWD, Beaumont Cherry Valley Water District. Not City of Beaumont.
24. Label roads and tracts, if adjoining, and on all sheets.
24. Verify restraints, especially at tract interfaces and pipe intersections. Verify drains, air vacs and blowoffs. Use 4" drain or blowoff and 2" air vacuum release valve for pipe up to 12" diameter pipe.
25. Check vertical and horizontal clearances between different pipelines and joint relationships.
26. Every pipe intersection or change of direction requires a specific, typical or standard detail.
27. Check cross-references of street name and sheet number.
28. Check pipe station, invert elevation and sheet number match from one sheet to the next at match lines.
29. Check stations and elevations at tract interfaces. Review adjoining tract drawings to obtain information.
30. Dash water line branches shown on other sheets.
31. Make fonts consistent.
32. Verify that street names and street limits match in title block, drawing view and index.
33. Check that fire hydrants match drawing index map.
34. Verify note regarding dry utilities, Note No.23, is included in General Notes.
35. Check pressure zone pressures and 3' minimum cover over pipeline is shown in all profiles for pipe sizes 8"-16". Four feet of cover for pipe sizes larger than 16".
36. Restraints solve only vertical problems in parallel construction. 4' clear horizontal and 1' clear vertical separation is required between water and storm drain lines, with water above storm drain line.
37. Verify proper horizontal and vertical clearance between water and recycled water lines. See District standard specifications and California Code of Regulations, Title 22, Section 64572.