



ARIZONA WATER COMPANY

SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS: E-8-1
NOVEMBER 30, 2017

STANDARD SPECIFICATION DRAWINGS: E-9-1
2010

ARIZONA WATER COMPANY

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ARIZONA WATER COMPANY

E-8-1

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

DEFINITIONS

- A. Company. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. Contractor. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. Contract. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

- a. Special compaction and paving for street crossing.
- b. Shoring when required because of the trench depth.
- c. Closing a trench in those areas where no open trench is allowed overnight.
- d. Barricading and traffic control as required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bell holes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during

trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

- a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.
- b. Native material 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R18-5-504 and R18-1-101. The Contractor will provide the following materials:

- a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5¼" main valve opening, three way, 6" Mechanical Joint Shoe, 1½" pentagon operating nut, color - yellow, drain open, open direction - left, 4' or 4'6" bury depending on application. For pumper and hose nozzle information see below.
 - (1) 1 - 4" Pumper Nozzle, NST and 2 - 2½" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San Manuel.)
 - (2) 1 - 4½" Pumper Nozzle, NST and 2 - 2½" Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)
 - (3) 1 - 4½" Pumper Nozzle, NST and 2 - 2½" Hose Nozzles, NPT (Bisbee only.)

- (4) 1 - 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and 2 - 2½" Hose Nozzles, NPT (Miami only.)
 - (5) 1 - 3½" Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and 2 - 2½" Hose Nozzle, NST (Superior only.)
- b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange; Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.
 - (1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16". Part No. 4" = 4FA-BC, 6" = 6FA-BC, 8" = 8FA-BC, 10" = 10FA-BC, 12" = 12FA-BC, 16" = 16FA-BC.
- c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x ¾" Trim Kit. Trim Kit Part No.: 4" = 282080, 6" = 282082, 8" = 282085, 10" = 282496.
- d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12" ; Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.
- e. TRACER WIRE and WARNING TAPE:
 - 1. TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.
 - 2. WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.
- f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and ½" NPT outlet, cast iron body and top flange; with a 5/64" orifice with stainless steel valve sealing faces and BUNA-N rubber.
- g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.
- h. MEGA LUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.
- i. METER BOXES:
 - (1) Concrete Box with a steel regular lid, Number 1: Tucson specification.
 - (2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.
- j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.

- k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:
 - (1) Pacific States Cast Iron Pipe Company
 - (2) Griffin Pipe
 - (3) United States Pipe and Foundry Company
 - (4) American Ductile Iron Pipe
 - (5) Clow Pipe (McWane, Inc.)

- l. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 235, sizes 4" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18. The use of C-900 Plastic Pipe is only allowed in the Coolidge area of the Pinal Valley water system with prior written approval from the Company's Engineering Department.

- m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.

- n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications – certified to ISO 9001:1994 / Smith – Blair Quantum.

- o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

- p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: 3/4", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

- q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".

Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).

- r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.
- s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18-8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.
- t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12"; T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners; bypass valves are required on 18" – 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".
- u. U-BRANCH: Mueller, H15364, 1" male iron pipe by ¾" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x ¾" x 1½", straight line.
- v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.
- w. VAULTS: Utility Vault Company, Chandler, AZ.

- (1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.
- (2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knock outs and adjustable frame.
- (3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

- x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

- y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x 3/4" x 7", 5/8 x 3/4" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these Specifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system.

Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Specification E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a

right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 ± 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

9. NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

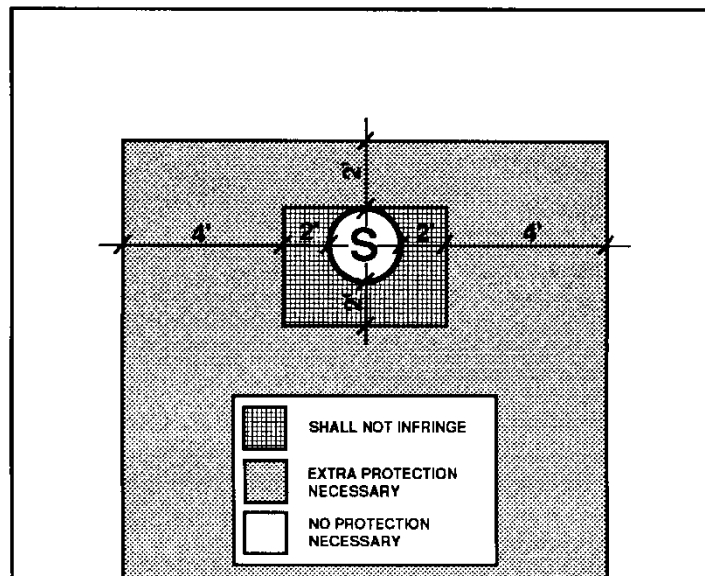
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

- a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



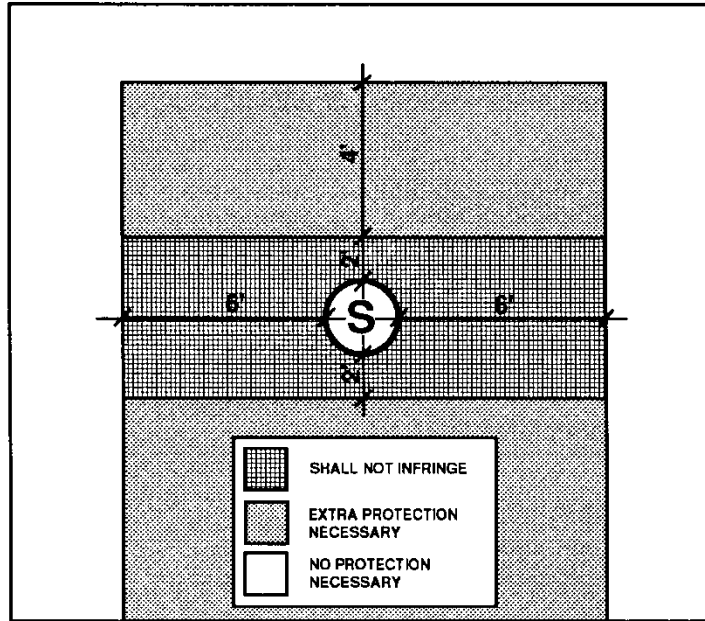
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

- b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



- f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:
 1. Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.
 2. Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.
- g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.
- h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.
- i. Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System – See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7° , 7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5° 21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

October 19, 2010

Mr. Jim Ryan
Clow Valve Company
8121 N. 10th Avenue
Phoenix, Arizona 85021

Re: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Ryan:

Thank you for your interest in working with Arizona Water Company (the "Company") to add Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the Clow product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Medallion Fire Hydrant:

- Model F-2545
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model 2639 & 2640
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2½" thru 12"
- Model 2638
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 14" thru 48"

E-MAIL: mail@azwater.com

ARIZONA WATER COMPANY

To: Jim Ryan – Clow Valve Company

October 19, 2010

Subject: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

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We look forward to developing a long-term relationship with you and the Clow products.
If I can be of any assistance, please call me.

Very truly yours,



Fredrick K. Schneider

Vice President – Engineering

lar

VIA EMAIL: JIM.RYAN@CLOWVALVE.COM

ARIZONA WATER COMPANY

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PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

November 24, 2010

Mr. Tony Geiger
US Pipe – Waterworks Marketing Consultants
34522 N. Scottsdale Road
Scottsdale, Arizona 85226

Re: US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Geiger:

Thank you for your interest in working with Arizona Water Company (the "Company") to add US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the US Pipe product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Sentinel Fire Hydrant:

- Model Sentinel 250
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model US Pipe A-USP0
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2" thru 12"
- Model US Pipe A-USP1
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 14" thru 48"

E-MAIL: masl@azwater.com

ARIZONA WATER COMPANY

To: Tony Geiger – US Pipe

November 24, 2010

Subject: US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the US Pipe products. If I can be of any assistance, please call me.

Very truly yours,



Fredrick K. Schneider

Vice President – Engineering

afh

VIA EMAIL: TGEIGER4@COX.NET

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, AZ 85015-5351 • P.O. BOX 29006, PHOENIX, AZ 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6874 • TOLL FREE: (800) 533-6023 • www.azwater.com

February 21, 2012

Contractor

Re: Fitting Specifications

Dear Contractor:

Effective March 1, 2012, Arizona Water Company (the "Company") has changed its fitting specifications for Ductile Iron Fittings and Ductile Iron Flanged Fittings ("Fittings"). All Fittings purchased by the Company, on the Company's behalf or installed with the intent of being conveyed to the Company, must comply with the requirements noted below.

Previous Fitting Specifications:

Fittings

Manufactured by Tyler or Union, Crosses, Elbows, Tees, Cap Reducer, Adapter, Plug, Blind Flange and Tapped Flange: Ductile Iron, Class 350, SSB, and Cast Iron Cement Lined.

New Fitting Specification:

Ductile Iron Fittings (Push-On and Mechanical Joint)

Ductile Iron Push-On and Mechanical Joint ("MJ") fittings for water lines shall be made of ductile iron per ASTM A536 and be cast in the United States of America. Fittings shall have USA cast on the fitting to designate they are made in the United States. All fittings will be manufactured and tested in accordance with ANSI/AWWA C153/A21.53 for compact design and ANSI/AWWA C110/A21.10 for full body design. In accordance with ANSI/AWWA C104/A21.4 fittings 2" – 3" will be single thickness cement mortar lined and 4" – 64" will be cement mortar lined. Fittings will be Asphaltic seal coated on the exterior in accordance with ANSI/AWWA C104/A21.4. MJ fittings with flanged end(s) will match ANSI/AWWA C115/A21.15 and ANSI B16.1 class 125 flanges. All fittings shall be NSF-61 listed for use with potable water.

Ductile Iron Flanged Fittings

E-MAIL: mail@azwater.com

Ductile Iron flanged fittings for water lines shall be made of ductile iron per ASTM A536 and be cast in the United States of America. Fittings shall have USA cast on the fitting to designate they are made in the United States. All fittings will be manufactured and tested in accordance with ANSI/AWWA C110/A21.10 design. Flange ends will match ANSI/AWWA C115/A21.15 and ANSI B16.1 class 125 flanges. In accordance with ANSI/AWWA C104/A21.4 fittings 2" – 3" will be single thickness lined and 4" – 64" will be cement mortar lined. Fittings will be Asphaltic seal coated on the exterior in accordance with ANSI/AWWA C104/A21.4. All fittings shall be NSF-61 listed for use with potable water.

If you have any questions or require further information, please contact me at 602-240-6860.

Very truly yours,



Fredrick K. Schneider, PE
Vice President - Engineering
engineering@azwater.com

afh
Enclosure

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, AZ 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6874 • TOLL FREE: (800) 533-6023 • www.azwater.com

November 28, 2016

Mr. David Shelton
Mueller Company
2557 N. Silverado
Mesa, AZ 85215

Re: Mueller Resilient Wedge Gate Valves

Dear Mr. Shelton:

Thank you for your interest in working with Arizona Water Company (the "Company") to add Mueller Full Body Ductile Iron Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the Mueller Company's product information you provided to the Company, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Resilient Wedge Gate Valves:

- Model 2362 Full Body Ductile Iron Gate Valve
 - Complies with AWWA C-509 specifications
 - Gate valves must include 304 SS nuts, bolts and a low zinc bronze stem
 - Size range 2 ½" thru 12"

We look forward to continuing our long-term relationship with you and the Mueller products. If I can be of any assistance, please call me.

Very truly yours,



Fredrick K. Schneider
Vice President – Engineering

ajh

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, AZ 85015-5351 • P.O. BOX 29006, PHOENIX, AZ 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6874 • TOLL FREE: (800) 533-6023 • www.azwater.com

June 15, 2017

Mr. Tony Geiger
US Pipe – Waterworks Marketing Consultants
34522 N. Scottsdale Road
Scottsdale, AZ 85226

Re: Resilient Wedge Gate Valves

Dear Mr. Geiger:

Thank you for your interest in working with Arizona Water Company (the "Company") to add US Full Body Ductile Iron Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the US Pipe Company's product information you provided to the Company, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Resilient Wedge Gate Valves:

- Model USP2 Full Body Ductile Iron Gate Valve
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem.
 - Size range 2" thru 12"

We look forward to continuing our long-term relationship with you and the US Pipe products. If I can be of any assistance, please call me.

Very truly yours,



Fredrick K. Schneider, P. E.
Vice President - Engineering
fschneider@azwater.com

afh
Enclosure

E-MAIL: engineering@azwater.com

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, AZ 85015-5351 • P.O. BOX 29006, PHOENIX, AZ 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6874 • TOLL FREE: (800) 533-6023 • www.azwater.com

January 25, 2018

Contractor

Re: Mechanical Joint Restraint

Dear Contractor:

Effective January 25, 2018, Arizona Water Company (the "Company") has changed its mechanical joint restraint specifications for MEGA LUG mechanical joint restraints. All mechanical joint restraints purchased by the Company, on the Company's behalf, or installed with the intent of being conveyed to the Company, must comply with the requirements noted below.

Previous Mechanical Joint Restraint Specification:

MEGA LUG: Mechanical joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.

New Mechanical Joint Restraint Specification:

Ductile Iron Mechanical Joint Restraints for water lines shall be made of ductile iron per ASTM A536 and be cast in the United States of America. Mechanical Joint Restraints shall have USA cast on the mechanical joint restraint to designate they are made in the United States. All mechanical joint restraints will be manufactured in accordance with ANSI/AWWA C110/A21.10. The mechanical joint restraints will have a minimum working pressure rating of 350 psi for pipe diameters ranging from 3-inch to 16-inch, and minimum 250 psi pressure rating for pipe diameters ranging from 18-inch to 48-inch. All mechanical joint restraints will have UL Certification for pipe diameters ranging from 3-inch to 24-inch and will have Factory Mutual Research Approval from 3-inch to 12-inch.

The following manufacturers are approved for the following pipe diameters:

Manufacturer	Product Name	Pipe Diameters
EBAA Iron	MEGA LUG Series 1100	3-inch to 48-inch
Star Pipe	Star Grip Series 3000	3-inch to 48-inch
Tyler Union	TUF Grip Series 1000	4-inch to 48-inch

Very truly yours,



Fredrick K. Schneider, P. E.
Vice President-Engineering

gr

E-MAIL: mail@azwater.com

ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS: E-9-1

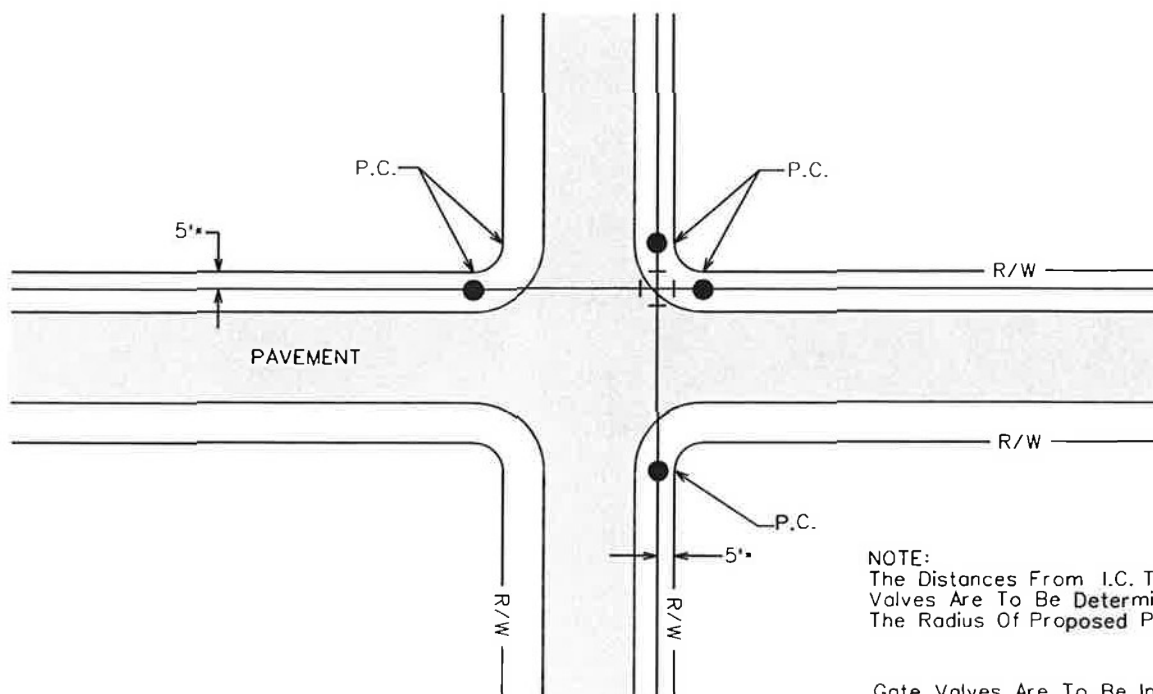
ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS

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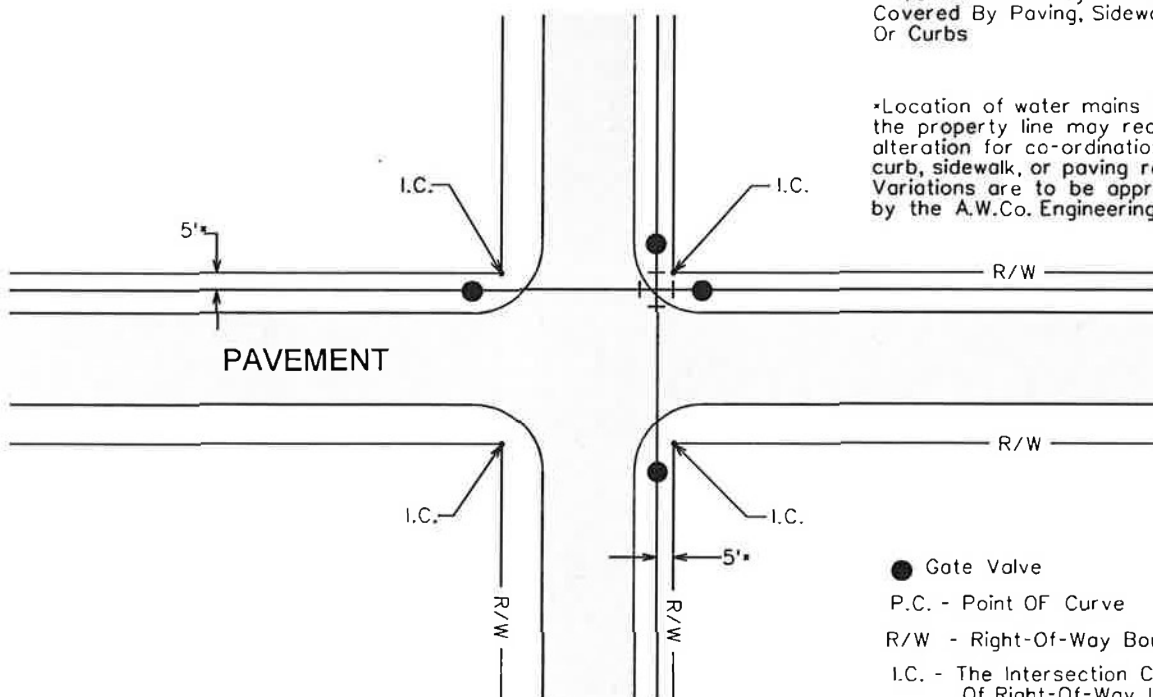
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NOTE:
The Distances From I.C. To Gate
Valves Are To Be Determined By
The Radius Of Proposed Pavement.

Gate Valves Are To Be Installed
In The Above Locations In Such
A Manner That They Will Not Be
Covered By Paving, Sidewalks,
Or Curbs

*Location of water mains from
the property line may require
alteration for co-ordination with
curb, sidewalk, or paving requirements.
Variations are to be approved
by the A.W.Co. Engineering dept.



- Gate Valve
- P.C. - Point Of Curve
- R/W - Right-Of-Way Boundary
- I.C. - The Intersection Corner
Of Right-Of-Way Lines

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL GATE VALVE LOCATIONS

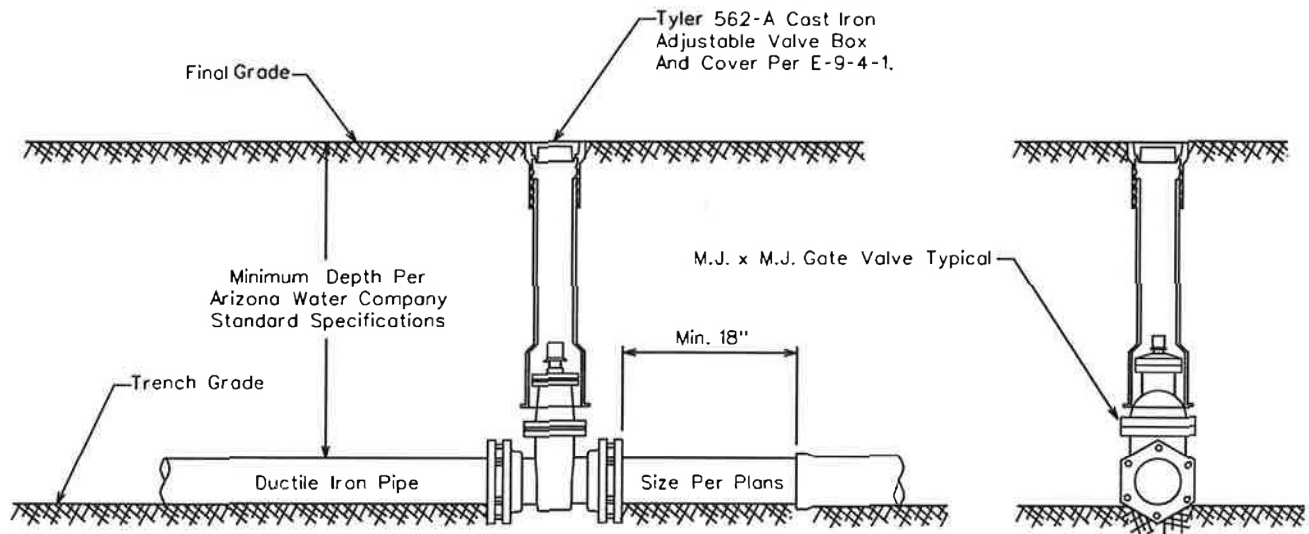
DRAWN BY: CCO	APPROVED BY: M.W.	DATE: 3/20/86	△ 1/31/2001	E-9-1-1
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FOR 6" THROUGH 12" GATE VALVES

Mueller Resilient Wedge Gate Valves
Catalog Number A-2360-__
ANSI/AWWA C509 Compliant

FOR 14" THROUGH 16" GATE VALVES

Mueller Resilient Wedge Gate Valves
Catalog Number A-2361-__
ANSI/AWWA C509 Compliant



All Valves Installed On Pipe Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL VERTICAL GATE VALVES

DRAWN BY:

CB

APPROVED BY:

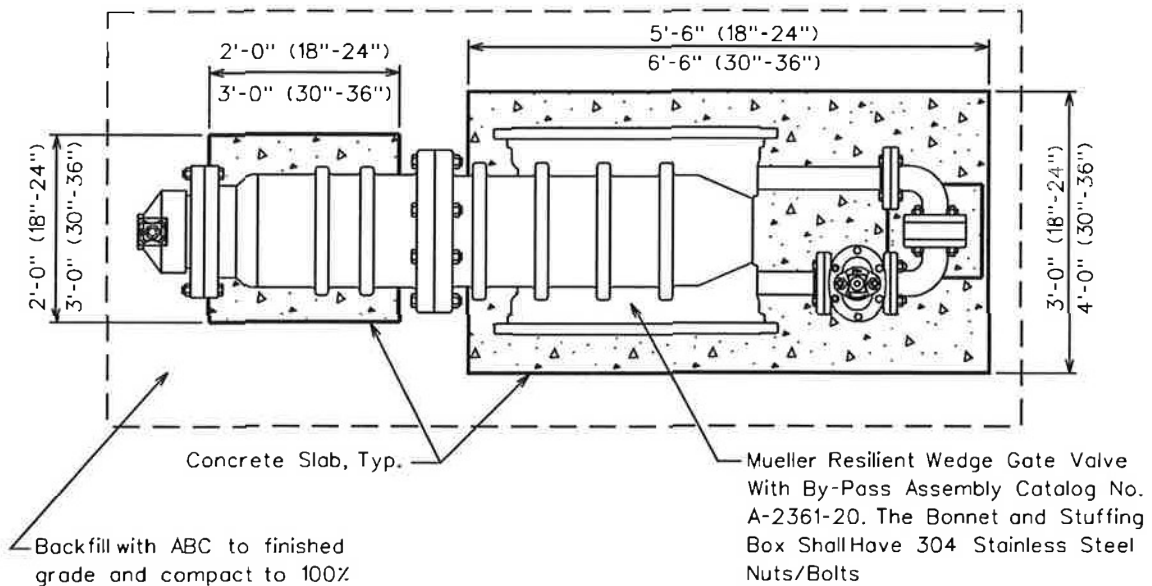
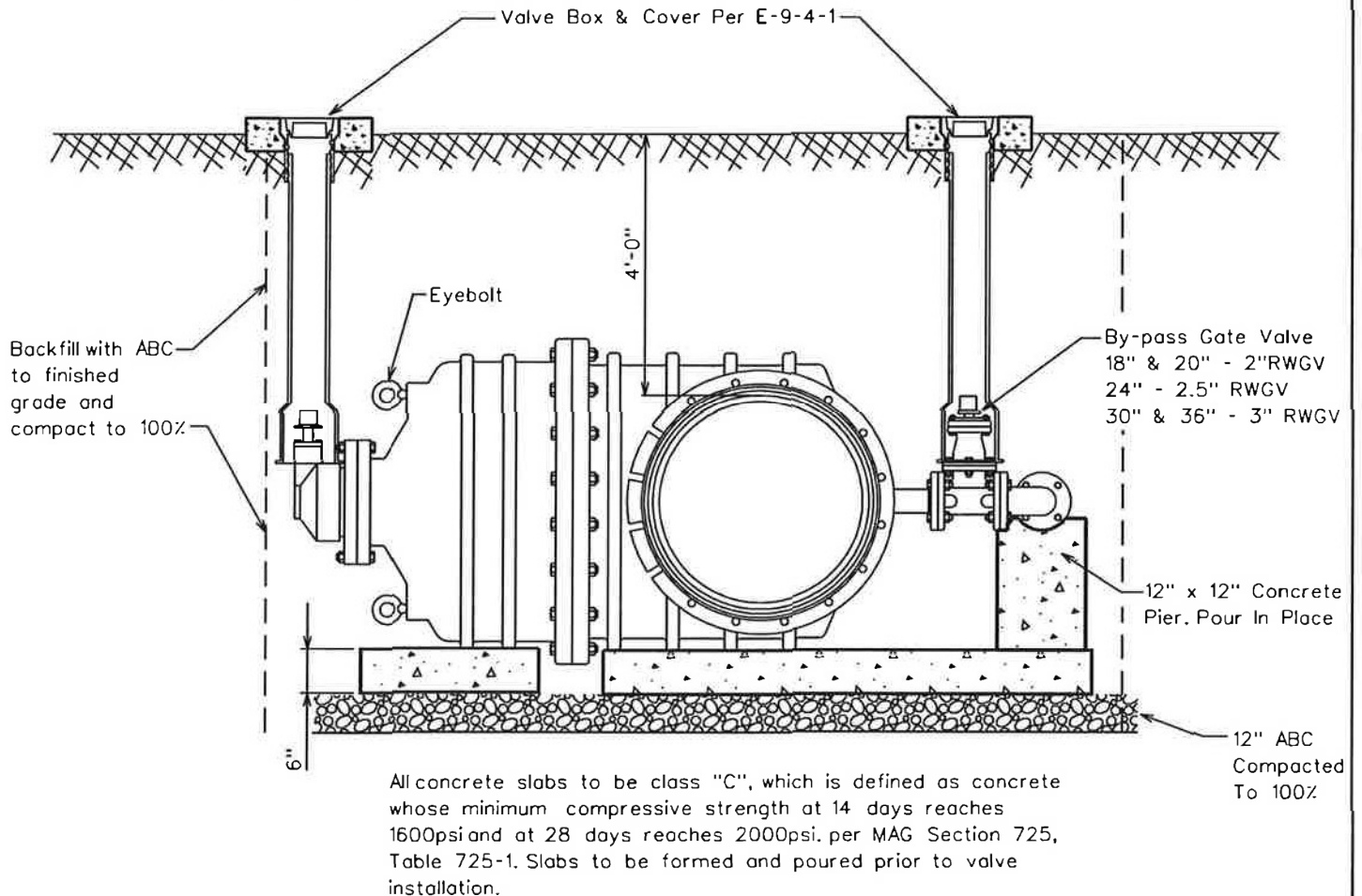
MW

DATE:

03.20.1986

08.23.2006

E-9-2-1



All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No. A-26441. The distance is measured from the top of the operating nut to final grade.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITH BY-PASS FOR 18" AND LARGER VALVES

DRAWN BY:

CB

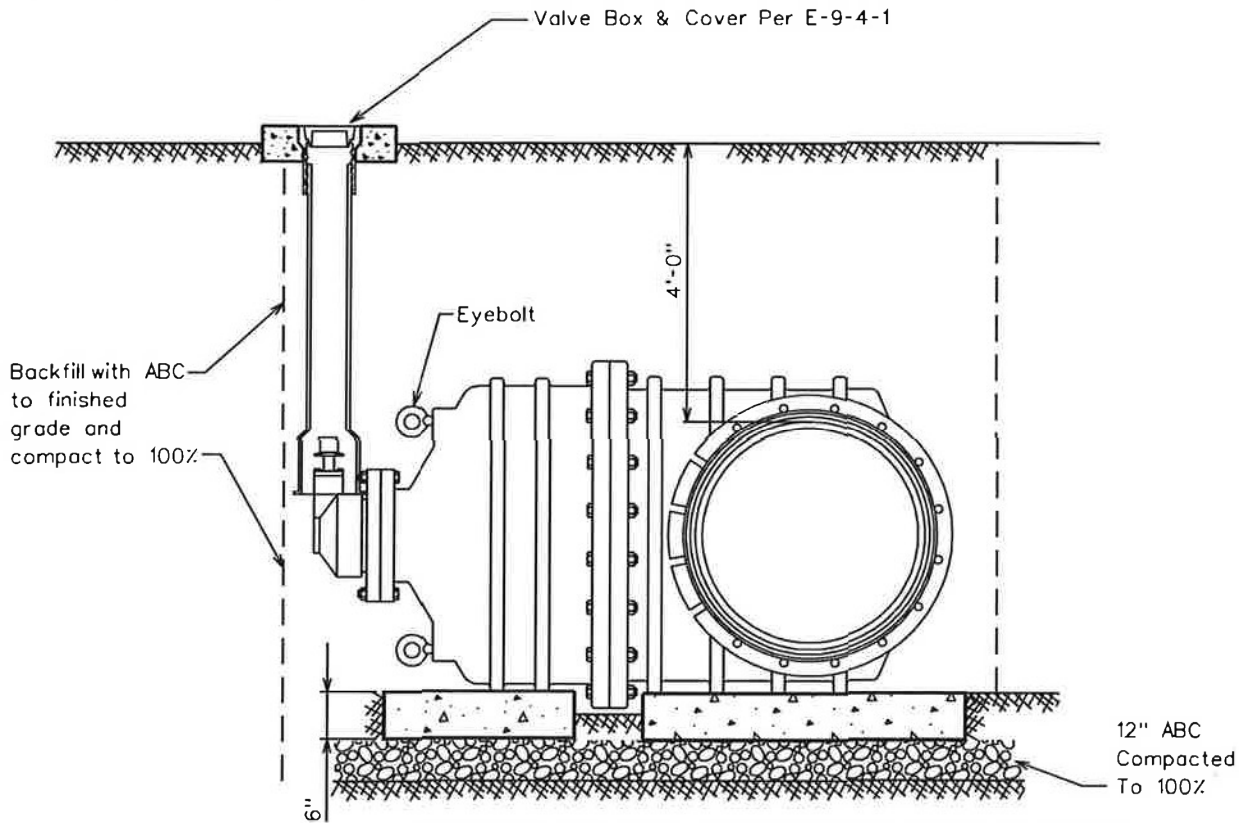
APPROVED BY:

DATE:

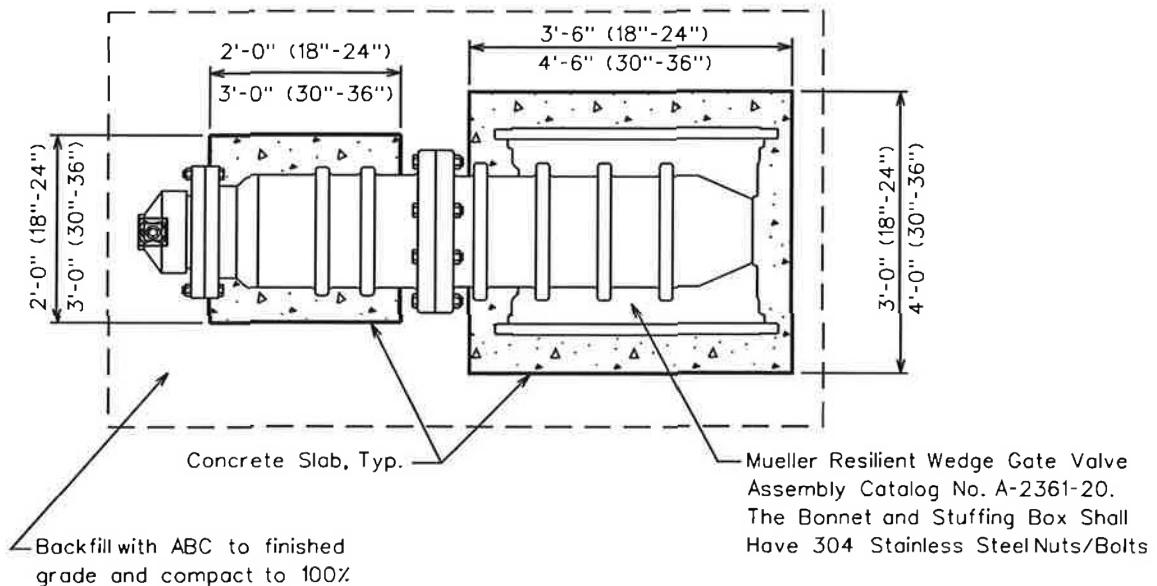
12.07.2004



E-9-2-2



All concrete slabs to be class "C", which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1. Slabs to be formed and poured prior to valve installation.



All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No. A-26441. The distance is measured from the top of the operating nut to final grade.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITHOUT A BY-PASS FOR 18" AND LARGER VALVES

DRAWN BY:

CB

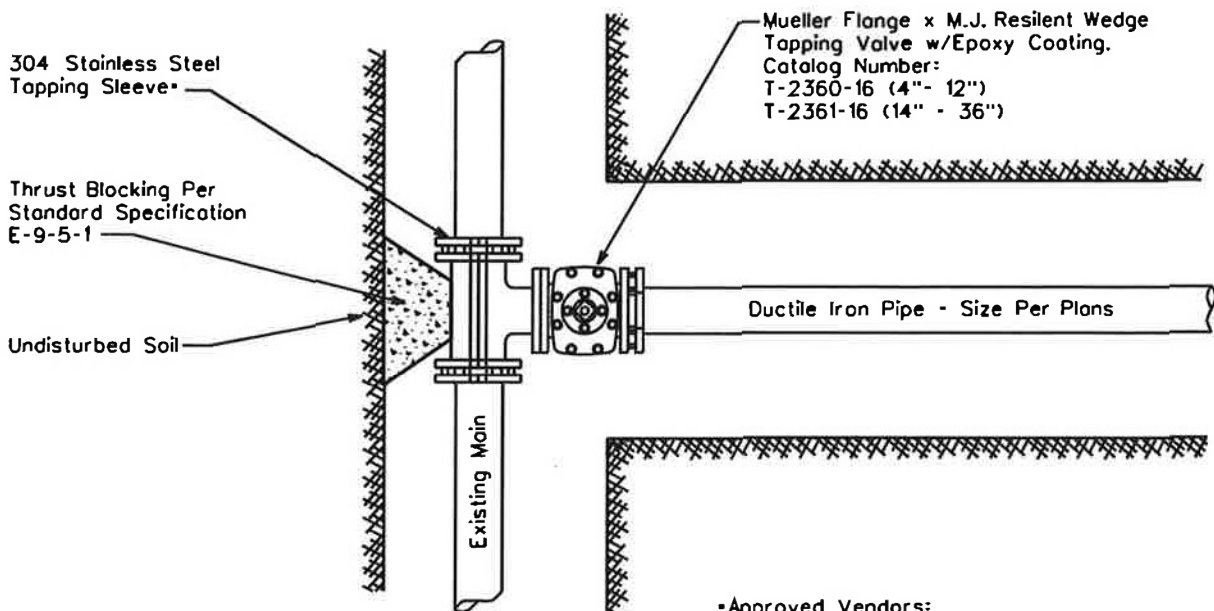
APPROVED BY:

DATE:

12.07.2004

△ 5.13.2005

E-9-2-3

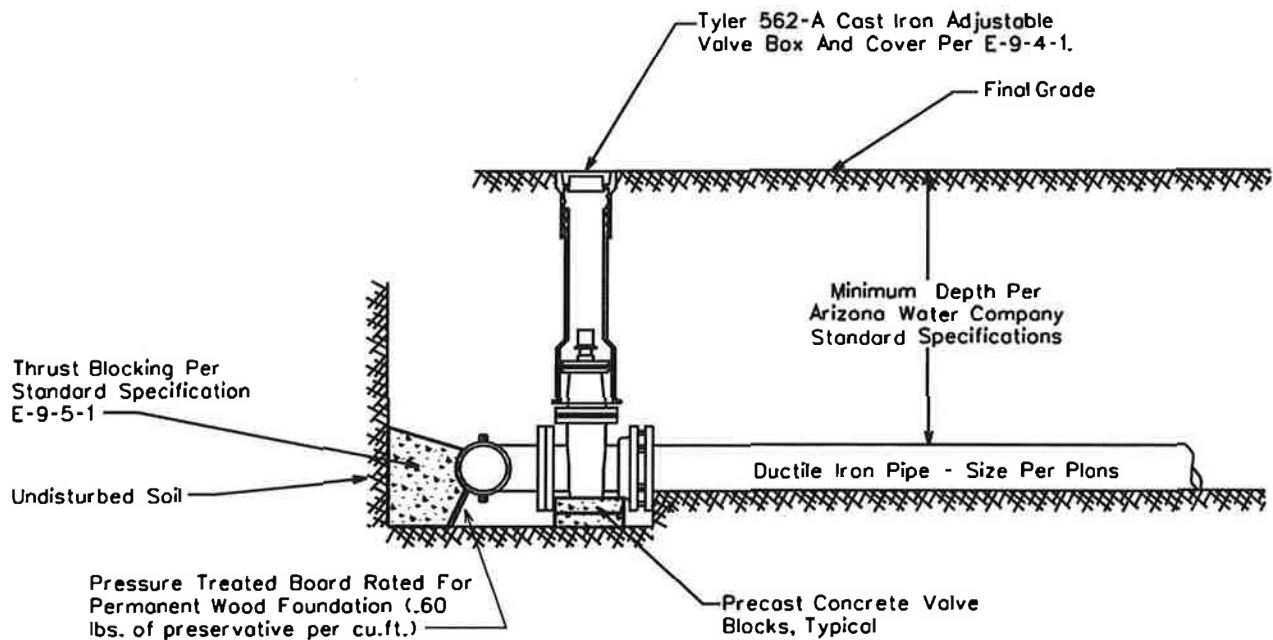


NOTE:

1. All flanges, bolts, and nuts shall be kept free of concrete.
2. Air pressure test the tapping sleeve before the live tap is made.
3. Polywrap all new fittings

Approved Vendors:

Mueller, Catalog No. H304, 304 Stainless Steel
 JCM, Model 432, 304 Stainless Steel
 Romac, 'SST', 304 Stainless Steel
 Cascade, 'CST-EX', 304 Stainless Steel

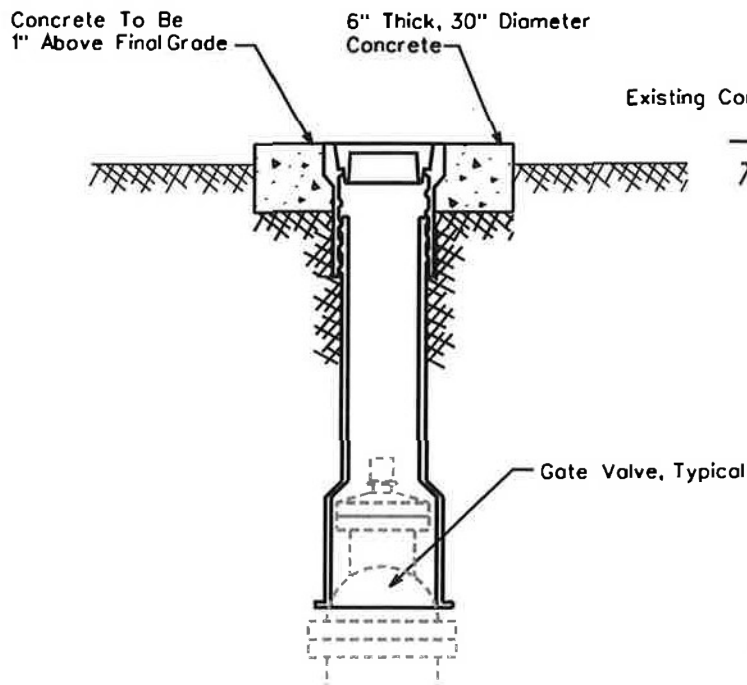


ARIZONA WATER COMPANY

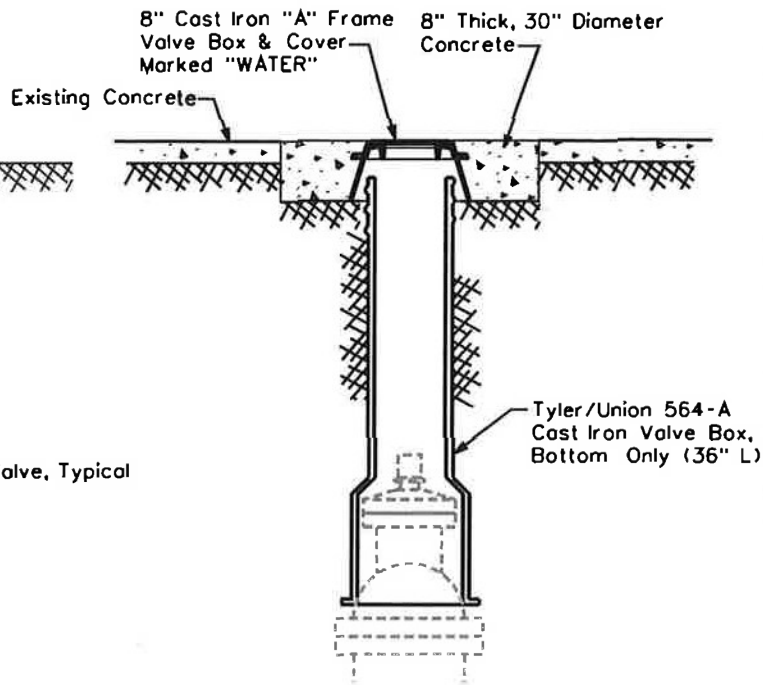
STANDARD SPECIFICATION
 FOR THE INSTALLATION OF

TYPICAL TAPPING SLEEVE AND VALVE

DRAWN BY: CB	APPROVED BY: MW	DATE: 03.20.1986	△ 08.23.2006	E-9-3-1
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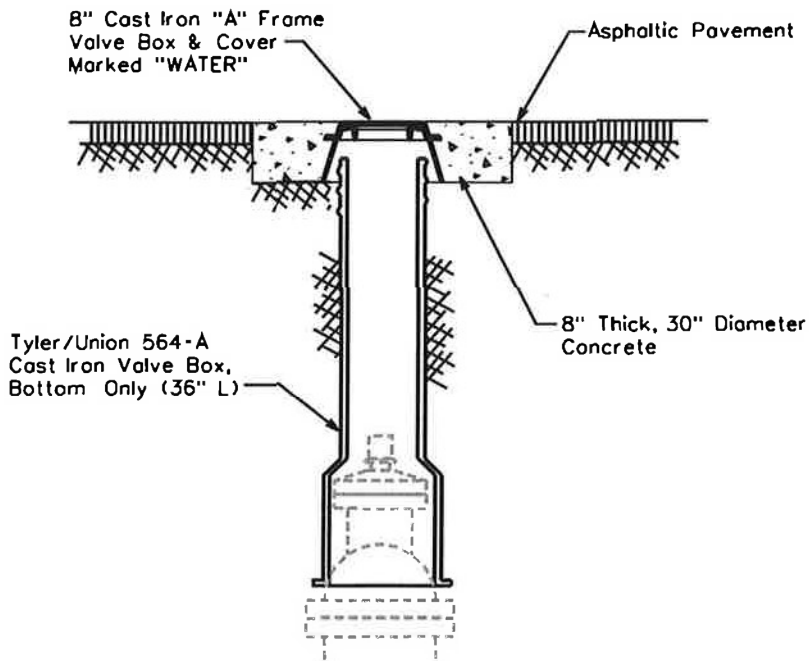


NON-VEHICULAR VALVE BOX



CONCRETE VALVE BOX

For Areas Subject To Vehicular Traffic



ASPHALT VALVE BOX

For Areas Subject To Vehicular Traffic

NOTE:

1. The Valve Box Shall Be Adjusted To Finished Grade Prior To Placing Of Asphalt And/Or Concrete.
2. For Non-Traffic Areas Use Tyler/Union 562-A, Two-Piece, 6855 Series Or Equivalent Adjustable Cast Iron Valve Box And Cover. Valves 4" To 12"
- For Traffic Areas, Use Tyler/Union 564-A Bottom Section Only With An 8" Cast Iron "A" Frame With Cover. Valves 4" To 12"
3. All Valves Installed Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441 And Shall Have A Debris Cap
4. Use Minimum Class 'C' Concrete which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL VALVE SUBJECT TO NON-VEHICULAR
AND VEHICULAR TRAFFIC

DRAWN BY:

CB

APPROVED BY:

MW

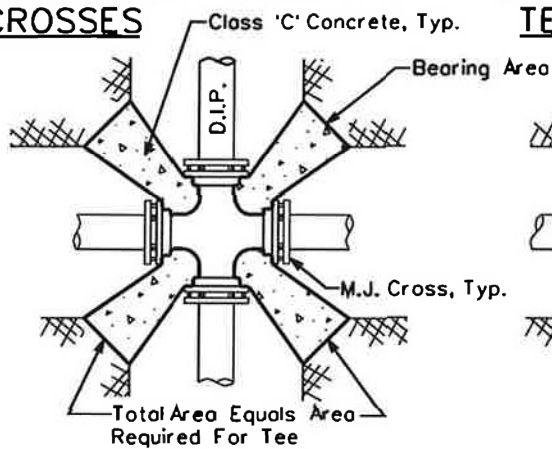
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03.20.1986

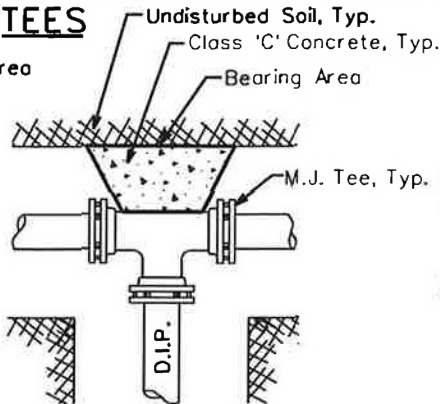
8.24.2006

E-9-4-1

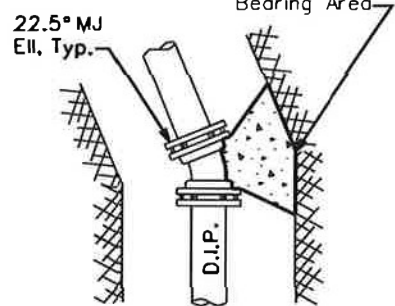
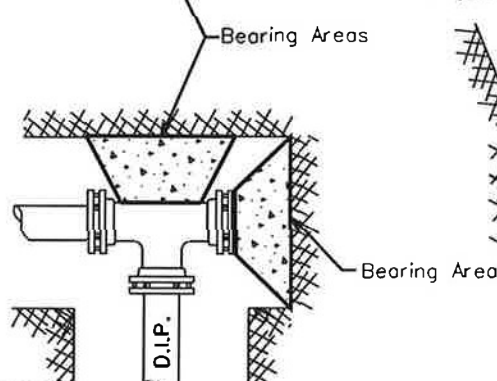
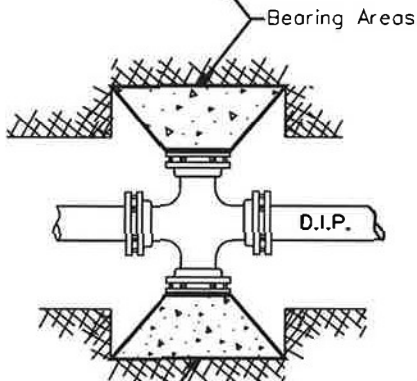
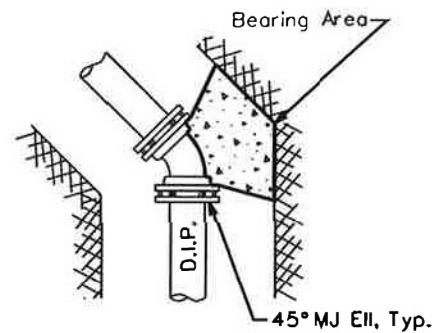
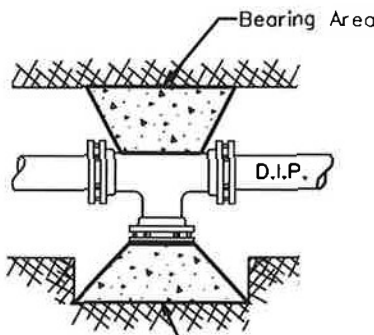
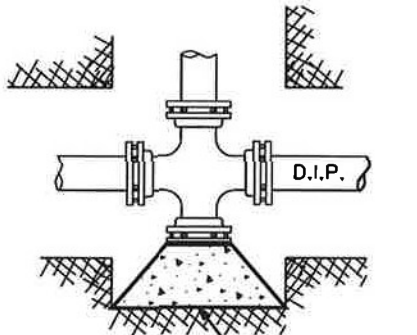
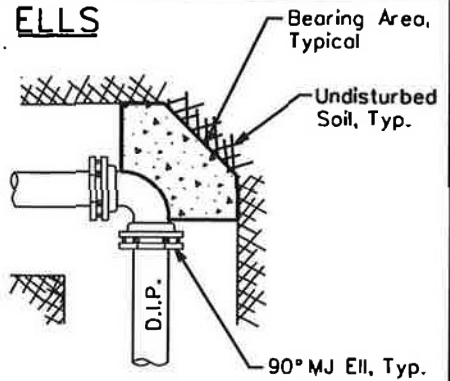
CROSSES



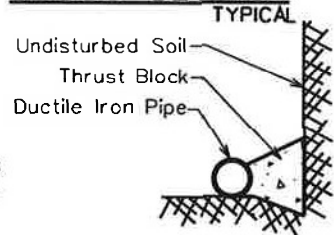
TEES



ELLS



CROSS SECTION



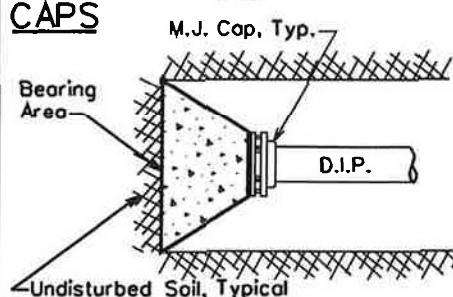
NOTES:

1. Use minimum Class 'C' concrete, which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1.
2. Thrust blocks are to bear on undisturbed earth with minimum bearing area as shown. If not undisturbed, areas will be increased as required.
3. Place the pressure treated form board in front of all plugs before pouring thrust blocks.
4. Form all non-bearing areas to prevent any concrete from entering any joint.
5. All flanges, bolts and nuts shall be kept free of concrete.
6. Center the bearing area on the pipe centerline and force line.
7. All pipe fittings to be wrapped with polyethylene pipe wrap prior to thrust block installation. (where applicable)

THRUST BLOCK SCHEDULE

PIPE SIZE	TEE, 45°, AND 22.5° ELLS, & PLUGS	90° ELLS
6" And Under	4 Sq.Ft.	6 Sq.Ft.
8"	6 Sq.Ft.	9 Sq.Ft.
12"	13 Sq.Ft.	20 Sq.Ft.
16"	23 Sq.Ft.	32 Sq.Ft.
18" And Larger	Calculated Per Project	

CAPS



STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL THRUST BLOCKING SCHEDULE

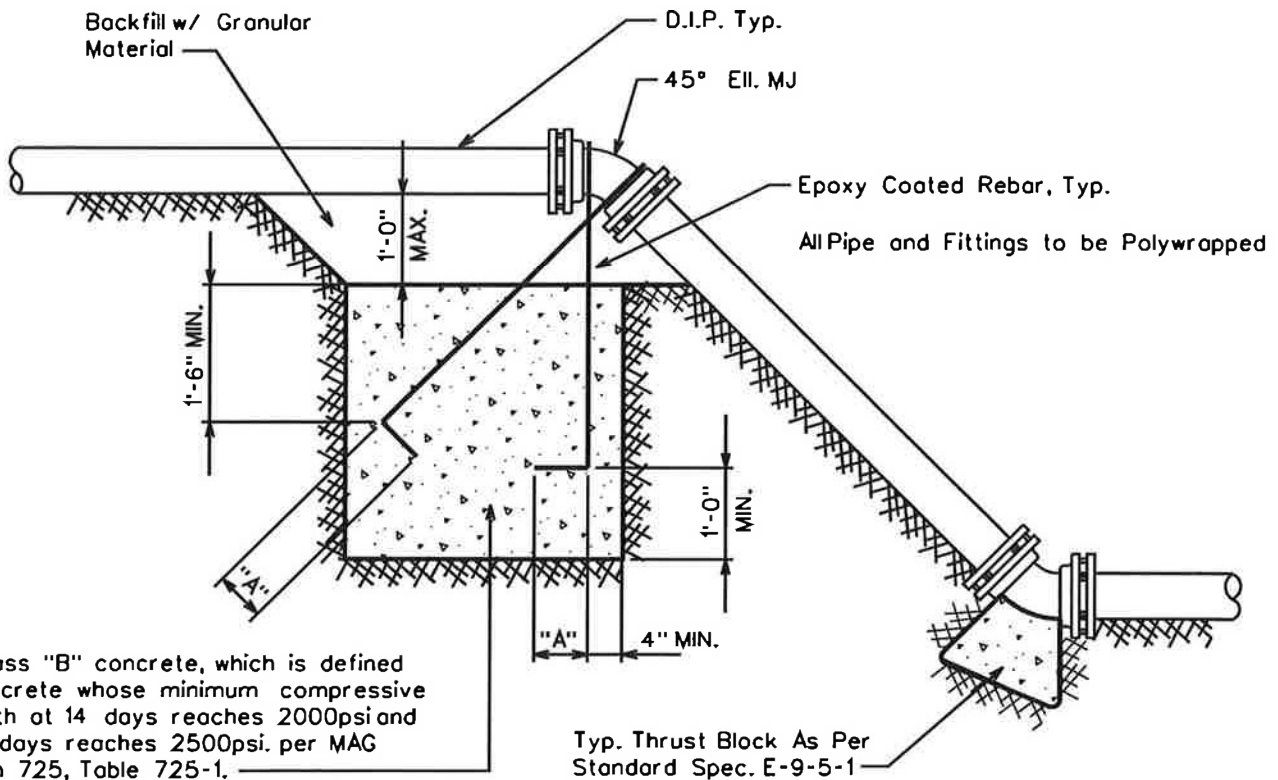
DRAWN BY: CB	APPROVED BY: MW	DATE: 03.20.1986	05.27.2005	E-9-5-1
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NOTES

1. Bars In Conc. Thrust Block To Be Coated w/ 2 Coats Coal Tar Epoxy or by Other Approved Method.
2. Bars To Have 90° Hook @ Their Ends, As Per Table Below.

Pipe Size	Min. Bar Size	"A" Dimension (Hook)	Min. Block Dimension (WxHxL)
6"	#6	6"	3'x3'x3'
8"	#6	9"	4'x3'x4'
12"	#8	9"	5'x4'x5'
16"	#9	12"	7'x6'x7'

* For 125 P.S.I. Working Pressure



ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

THRUST BLOCK FOR VERTICAL BENDS

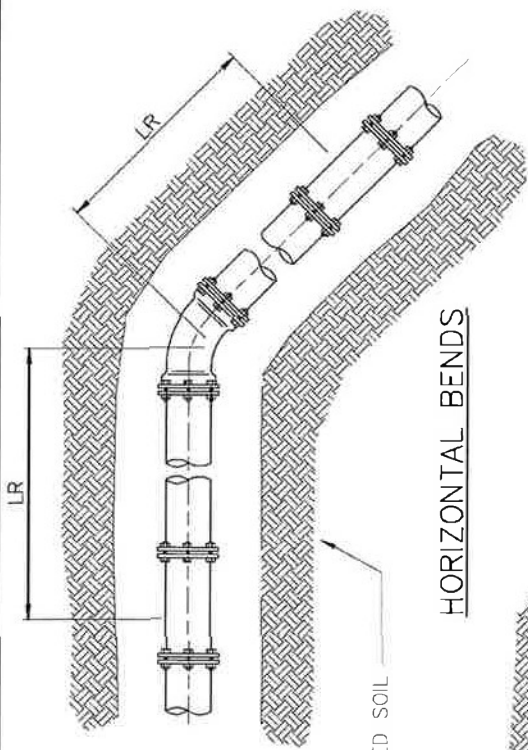
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APPROVED BY: MJW

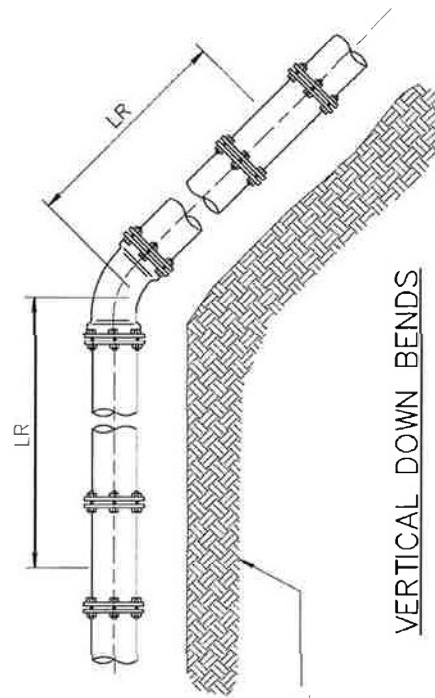
DATE: 7-5-96

△ 01.16.2007

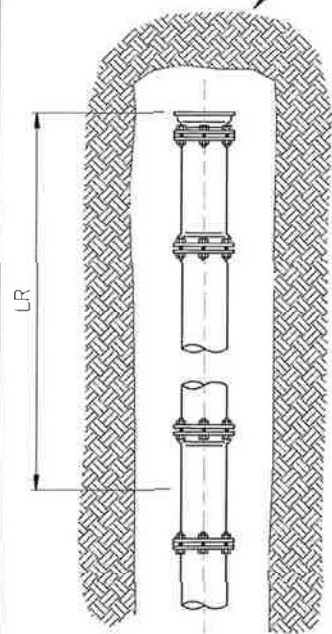
E-9-5-2



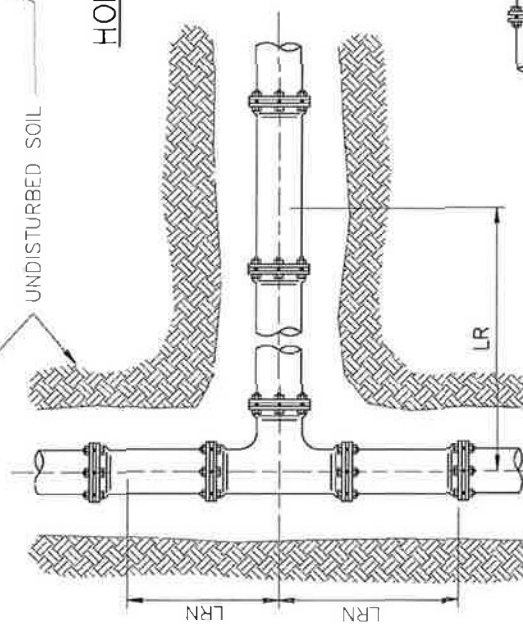
HORIZONTAL BENDS



VERTICAL DOWN BENDS

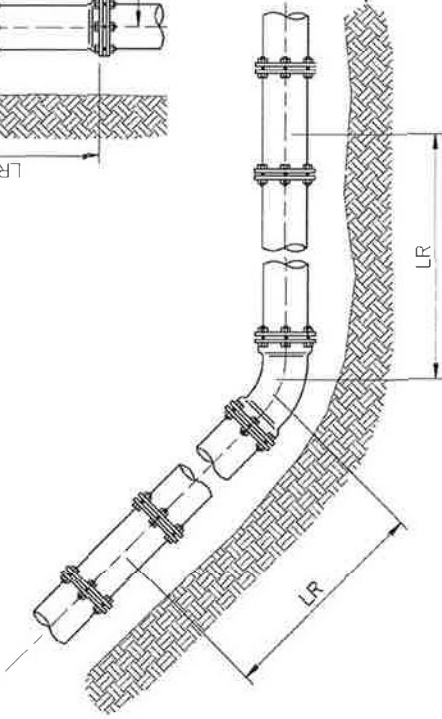


DEAD ENDS



TEES

LRN = SHORTEST LENGTH OF PIPE RESTRAINED TO THE RUN OF THE TEE FITTING (BOTH SIDES OF TEE).



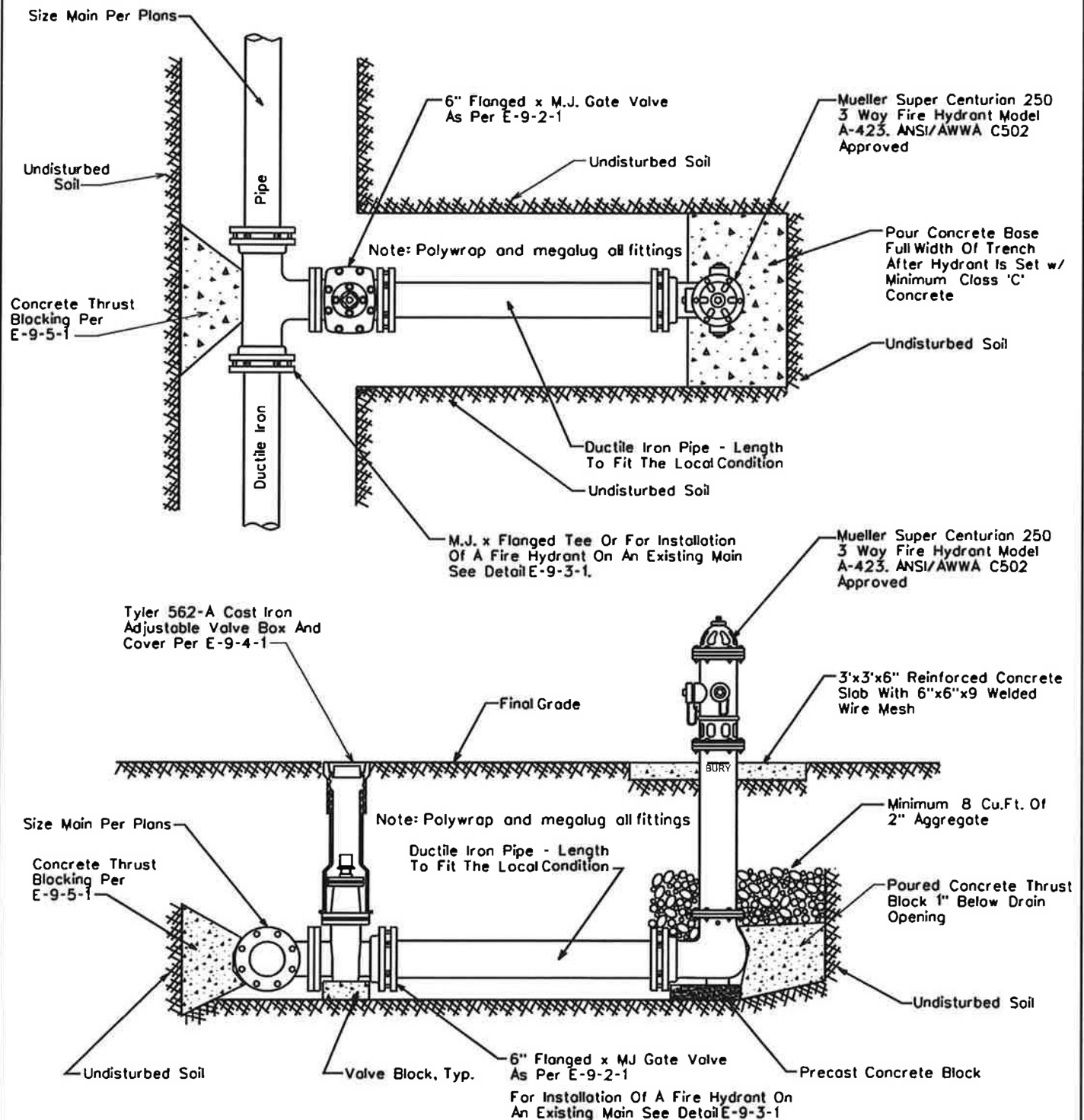
VERTICAL UP BEND

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

JOINT RESTRAINT FOR NEW DUCTILE IRON AND C-900 PVC MAINS

DRAWN BY: CB	APPROVED BY: MW	DATE: 01.16.2007	△	E-9-5-3-1
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NOTE: All Flanges, Bolts, Nuts and Drain Holes Shall Be Kept Free Of Concrete

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL PERPENDICULAR FIRE HYDRANT

DRAWN BY:

CB

APPROVED BY:

MW

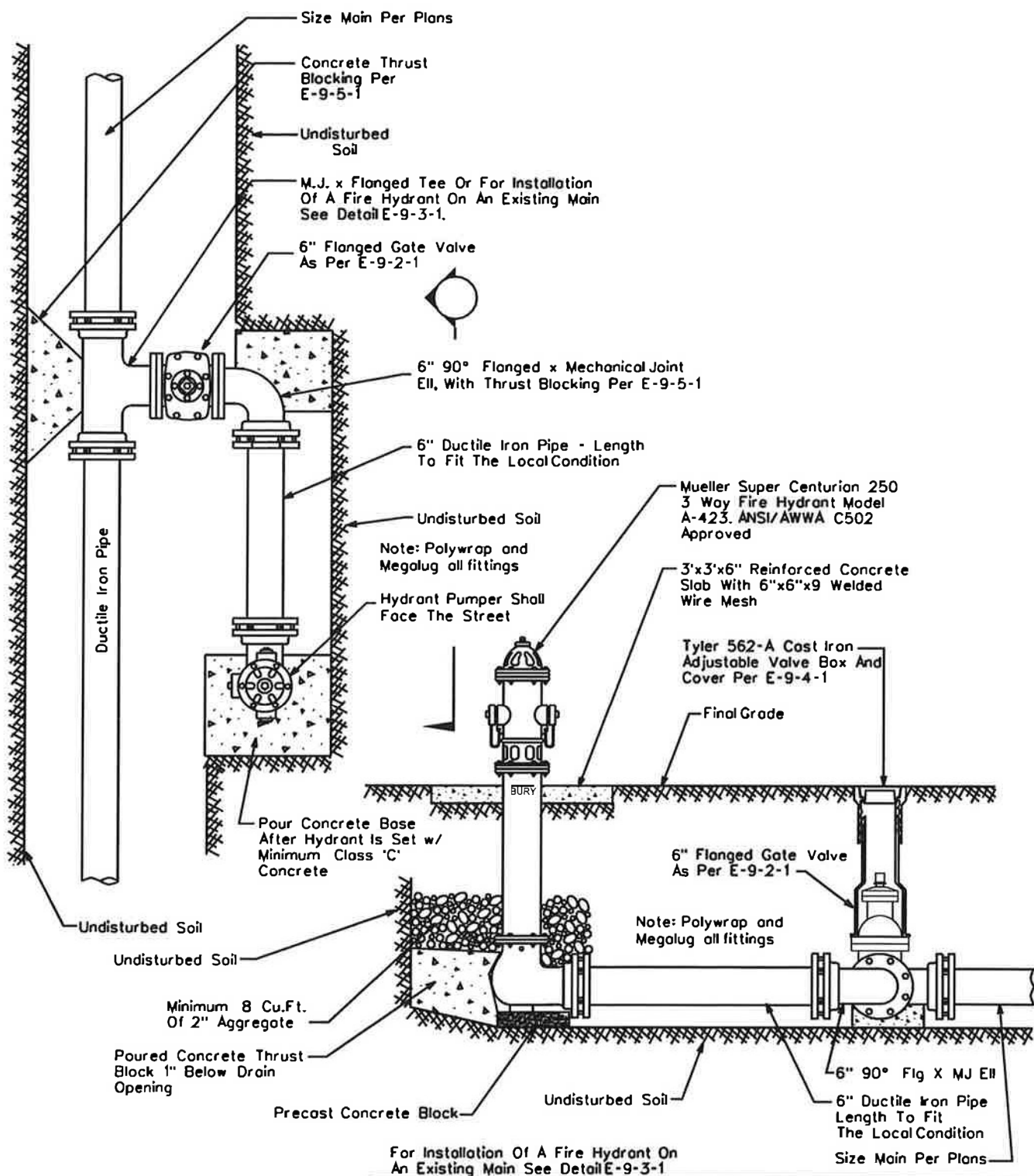
DATE:

1-28-91



08.24.2006

E-9-6-1



NOTE: All Flanges, Bolts, Nuts And Drain Holes Shall Be Kept Free Of Concrete.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL PARALLEL FIRE HYDRANT

DRAWN BY:

JW

APPROVED BY:

MW

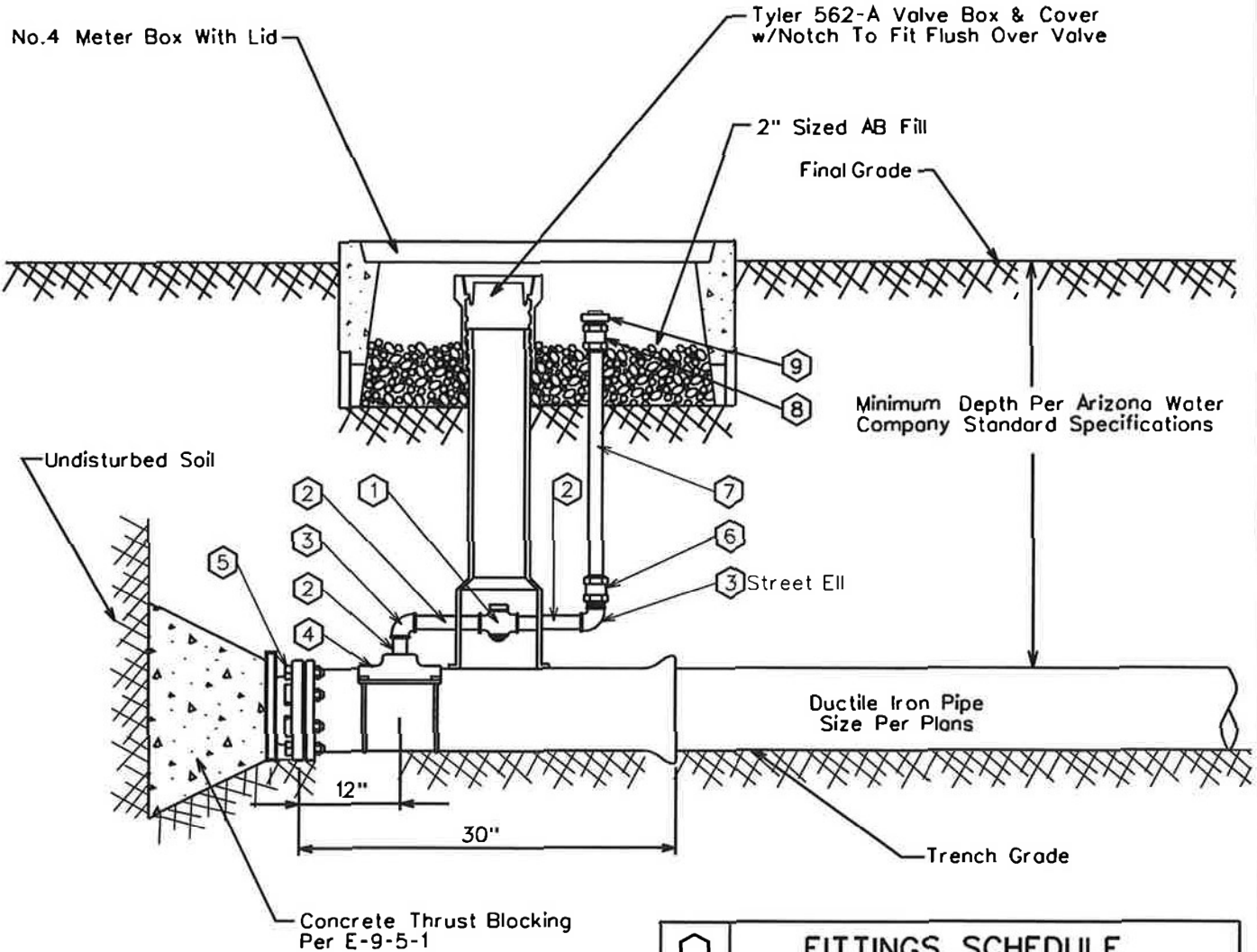
DATE:

03.20.1986



08.24.2006

E-9-7-1



FITTINGS SCHEDULE	
1.	2" Mueller 300 Ball Curb Valve B-20283 FIP x FIP W/ 2" Mueller Brass Square Wrench Nut Adapter B-20299
2.	2" Brass Nipple - Length To Fit Field Conditions
3.	2" Brass 90° Elbow, IPST
4.	Mueller Double Strap Bronze Service Saddle - BR2B
5.	M.J. Plug - Megalug Restraints May Be Required
6.	2" Straight Coupling CC x FIP H-15451
7.	2" Copper Pipe
8.	2" Straight Coupling CC x MIP H-15428
9.	2" Square Head Plug, MIP

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

2" BLOWOFF ASSEMBLY

DRAWN BY:

CB

APPROVED BY:

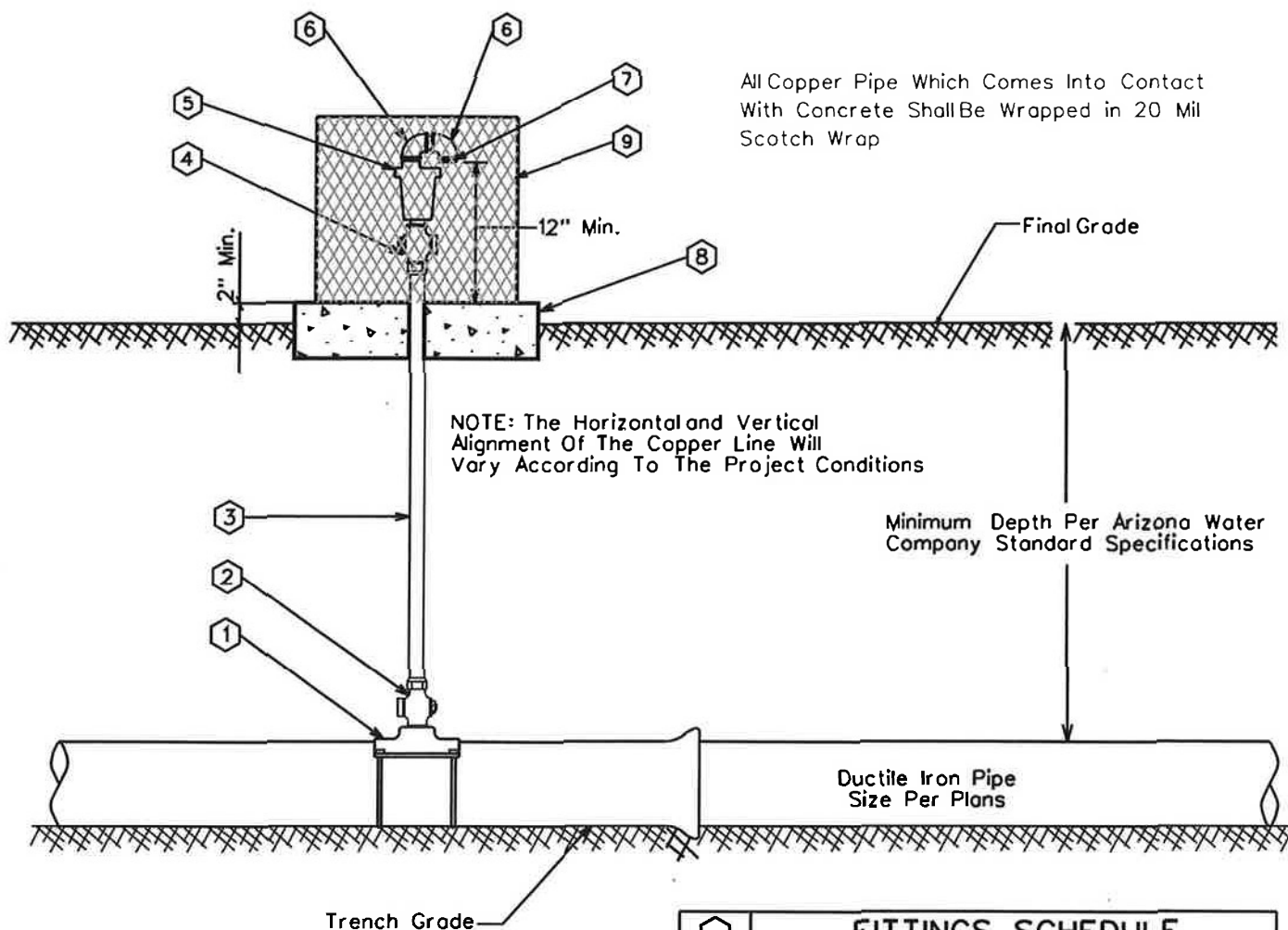
MW

DATE:

03.20.1986

△ 03.21.2006

E-9-8-1



GENERAL NOTES:

1. The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.
2. The valve shall have a $\frac{3}{4}$ " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
3. The valve shall be Crispin model AR10 for 6" and larger water mains.
4. Crispin model AR10 valve construction consists of a 1" IPST inlet & $\frac{1}{2}$ " IPST outlet, cast iron body and top flange with stainless steel float and trim.
5. The air release assembly shall be located out of the path of traffic but within right-of-way or easement.

○	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	1" Mueller B-2500B Taper x Comp. Ball Corp Stop
3.	1" Type 'K' Copper w/NO Splices - Field Fit
4.	1" Mueller B-2502B IP x Comp. Ball Corp Stop
5.	Crispin 1" Air Release Valve, Model AR10
6.	$\frac{1}{2}$ " Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Guardshock, Model GS-1, Available From BPD, Inc. Available In Leaf Green Or Desert Tan

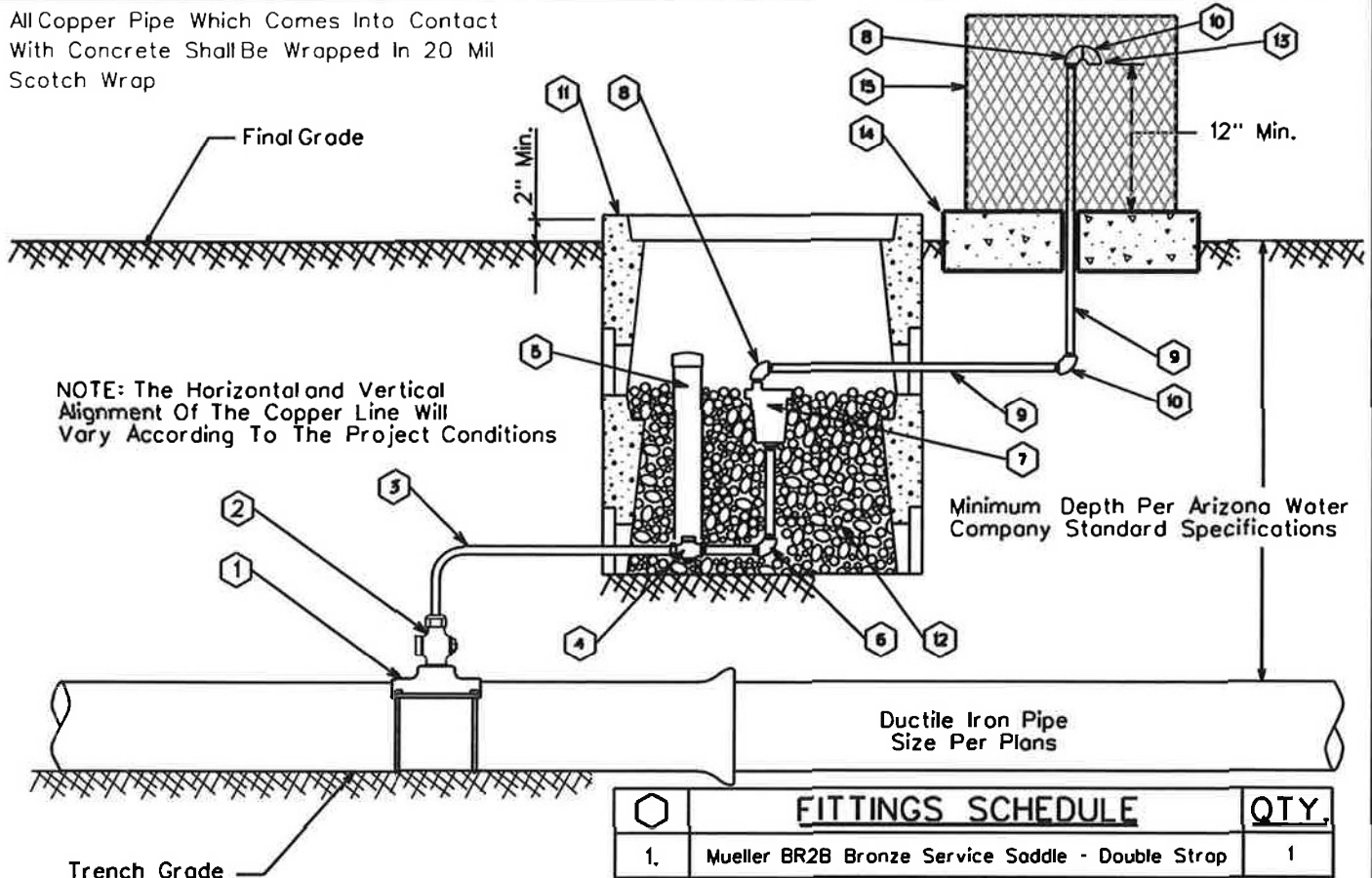
ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL AIR RELEASE VALVE

DRAWN BY: CB	APPROVED BY: MW	DATE: 03.20.1997	08.24.2006	E-9-8-2
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All Copper Pipe Which Comes Into Contact With Concrete Shall Be Wrapped In 20 Mil Scotch Wrap



GENERAL NOTES:

1. The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.
2. The valve shall have a $\frac{3}{4}$ " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
3. The valve shall be Crispin model AR10 for 6" and larger water mains.
4. Crispin model AR10 valve construction consists of a 1" IPST inlet & $\frac{1}{2}$ " IPST outlet, cast iron body and top flange with stainless steel float and trim.
5. The air release assembly shall be located out of the path of traffic but within the right-of-way or easement.

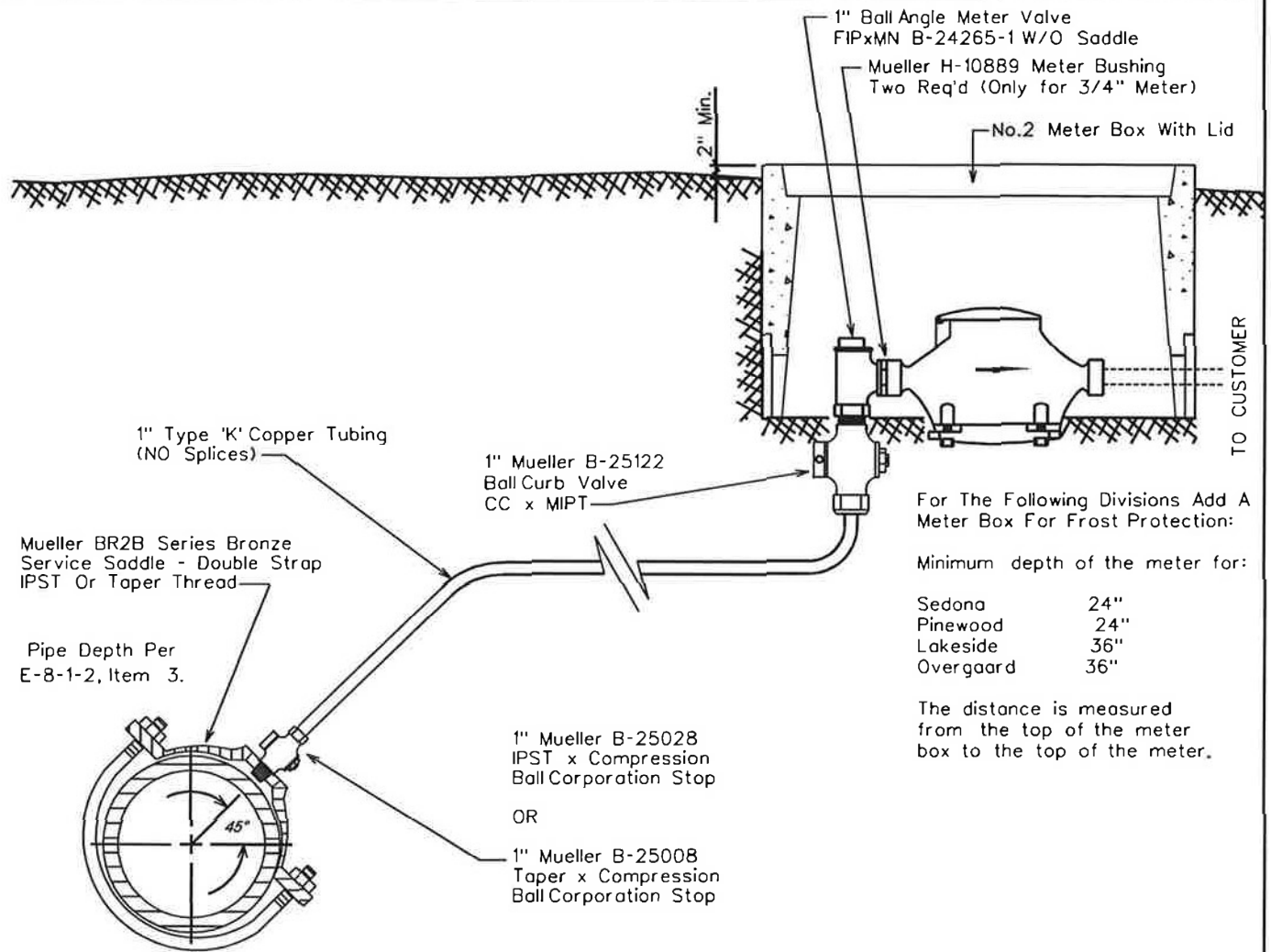
QTY.	FITTINGS SCHEDULE	
1	Mueller BR2B Bronze Service Saddle - Double Strap	1
2	1" Mueller B-25008 Taper x Comp. Ball Corp Stop	1
3	1" Type 'K' Copper w/NO Splices - Field Fit	As Req'd
4	1" Mueller B-25028 IP x Comp. Ball Corp Stop	1
5	3" PVC Pipe w/ Cap (Loose Fit)	1
6	1" x 4" Brass Nipple w/90° Elbow	1
7	Crispin 1" Air Release Valve, Model AR10	1
8	$\frac{1}{2}$ " Brass Street Elbow	2
9	$\frac{1}{2}$ " Galvanized Pipe - Length as req'd	2
10	$\frac{1}{2}$ " Galvanized 90° Ell	2
11	Number 1 Meter Box	2
12	2" Sized AB (Fill Meter Box To The Top Of The Air Release Valve)	As Req'd
13	No.16 Wire Mesh Screen (Non-Corrodible)	1
14	4" Thick Concrete Pad - Class 'C' Concrete	1
15	Guardshack, Model GS-1, Available From BPD, Inc. Available in Leaf Green Or Desert Tan	1

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

AIR RELEASE VALVE FOR THE NORTHERN REGION

DRAWN BY: CB APPROVED BY: MW DATE: 03.20.1997 08.24.2006 E-9-8-3



SADDLE TAP TO CA, PVC, OR DI PIPE

NOTE: The minimum distance between
taps on mains other than ductile iron is 12"

NOTE:
Only the meter is supplied by
Arizona Water Company

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER

DRAWN BY:

CCO

APPROVED BY:

M.W.

DATE:

3/20/86

△ 03.17.2006

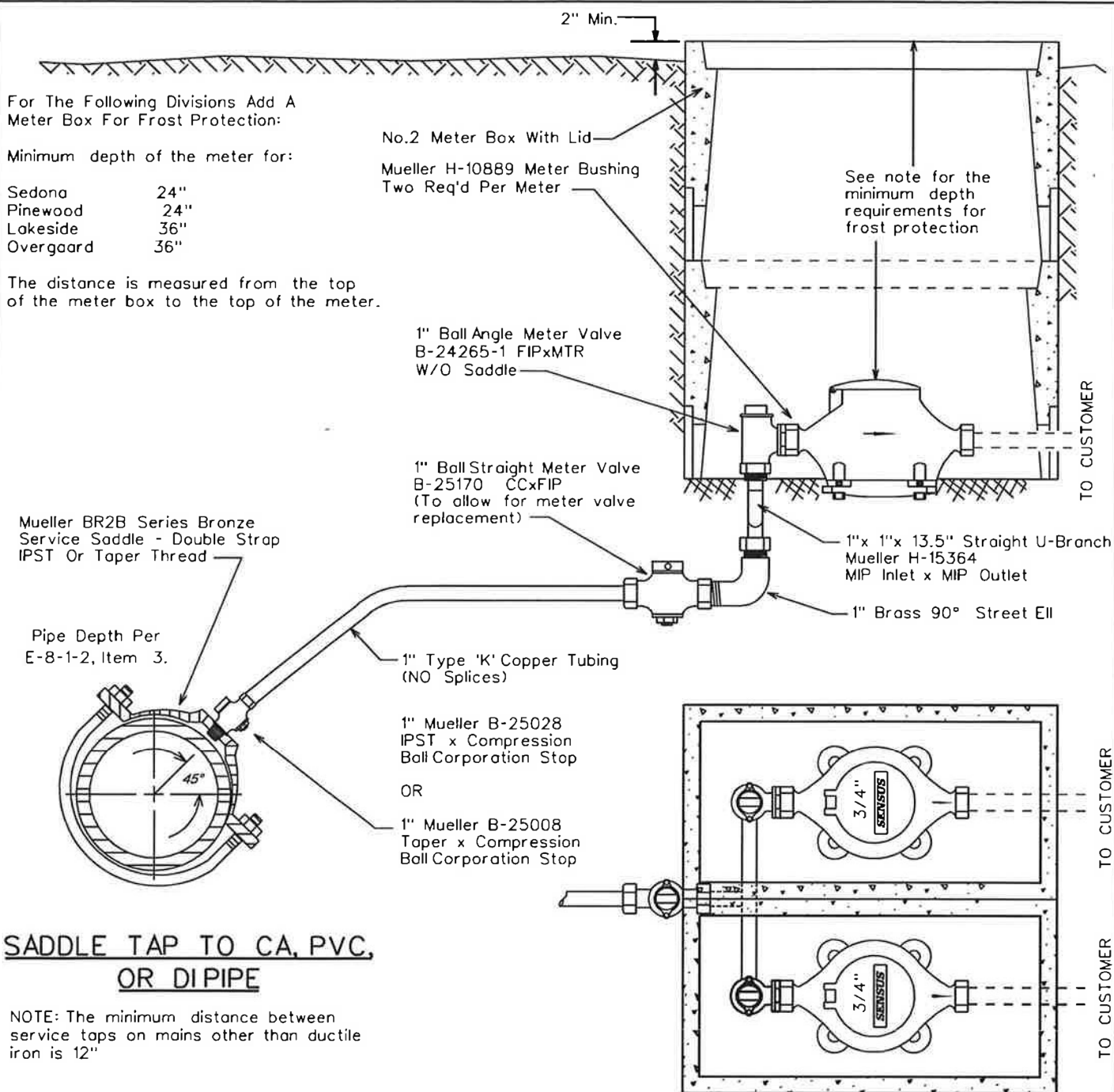
E-9-9-1

For The Following Divisions Add A
Meter Box For Frost Protection:

Minimum depth of the meter for:

Sedona	24"
Pinewood	24"
Lakeside	36"
Overgaard	36"

The distance is measured from the top
of the meter box to the top of the meter.



SADDLE TAP TO CA, PVC, OR DI PIPE

NOTE: The minimum distance between
service taps on mains other than ductile
iron is 12"

NOTE:
Only the meter is supplied by
Arizona Water Company

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

DOUBLE SERVICE CONNECTION FOR 3/4" METERS

DRAWN BY: CCO	APPROVED BY: M.W.	DATE: 3-20-86	△ 08.25.2006	E-9-10-1
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For The Following Divisions Add A
Meter Box For Frost Protection:

Minimum depth of the meter for:

Sedona	24"
Pinewood	24"
Lakeside	36"
Overgaard	36"

The distance is measured from the top
of the meter box to the top of the meter.

Mueller BR2B Series Bronze
Service Saddle - Double Strap
IPST Or Taper Thread

2" Type 'K' Copper Tubing
(NO Splices)

1" Ball Angle Meter Valve
B-24265-1 FIPxMTR
W/O Saddle

2" Mueller Ball Curb Valve
B-25172 CCxFIP
(To allow for meter valve
replacement)

2" Mueller B-25028
IPST x Compression
Ball Corporation Stop

OR

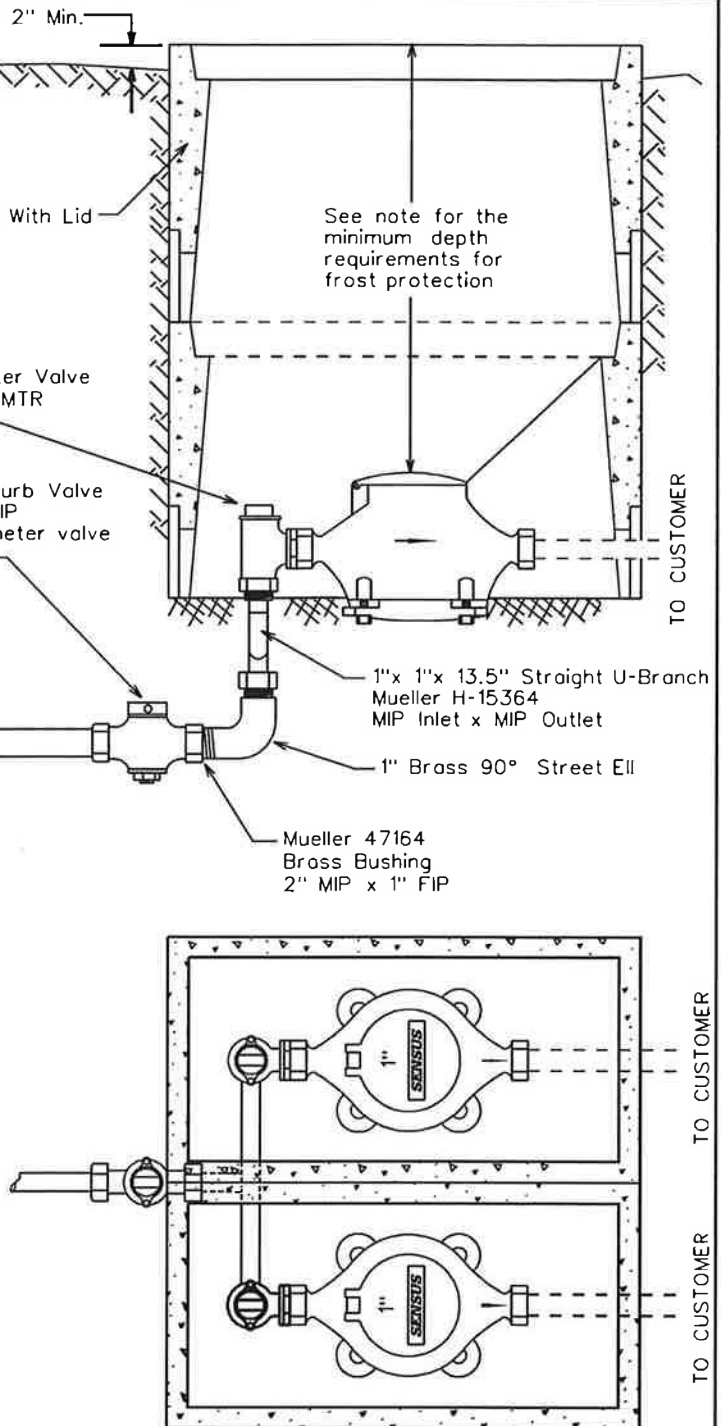
2" Mueller B-25008
Taper x Compression
Ball Corporation Stop

Pipe Depth Per
E-8-1-2, Item 3.

SADDLE TAP TO CA, PVC, OR DI PIPE

NOTE: The minimum distance between
service taps on mains other than ductile
iron is 12"

NOTE: THE LENGTH OF SERVICE IS LIMITED TO
COMMERCIALY AVAILABLE ROLLS, TYPICALLY
60 FEET



NOTE:
Only the meter is supplied by
Arizona Water Company

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

DOUBLE SERVICE CONNECTION FOR 1" METERS

DRAWN BY:

CB

APPROVED BY:

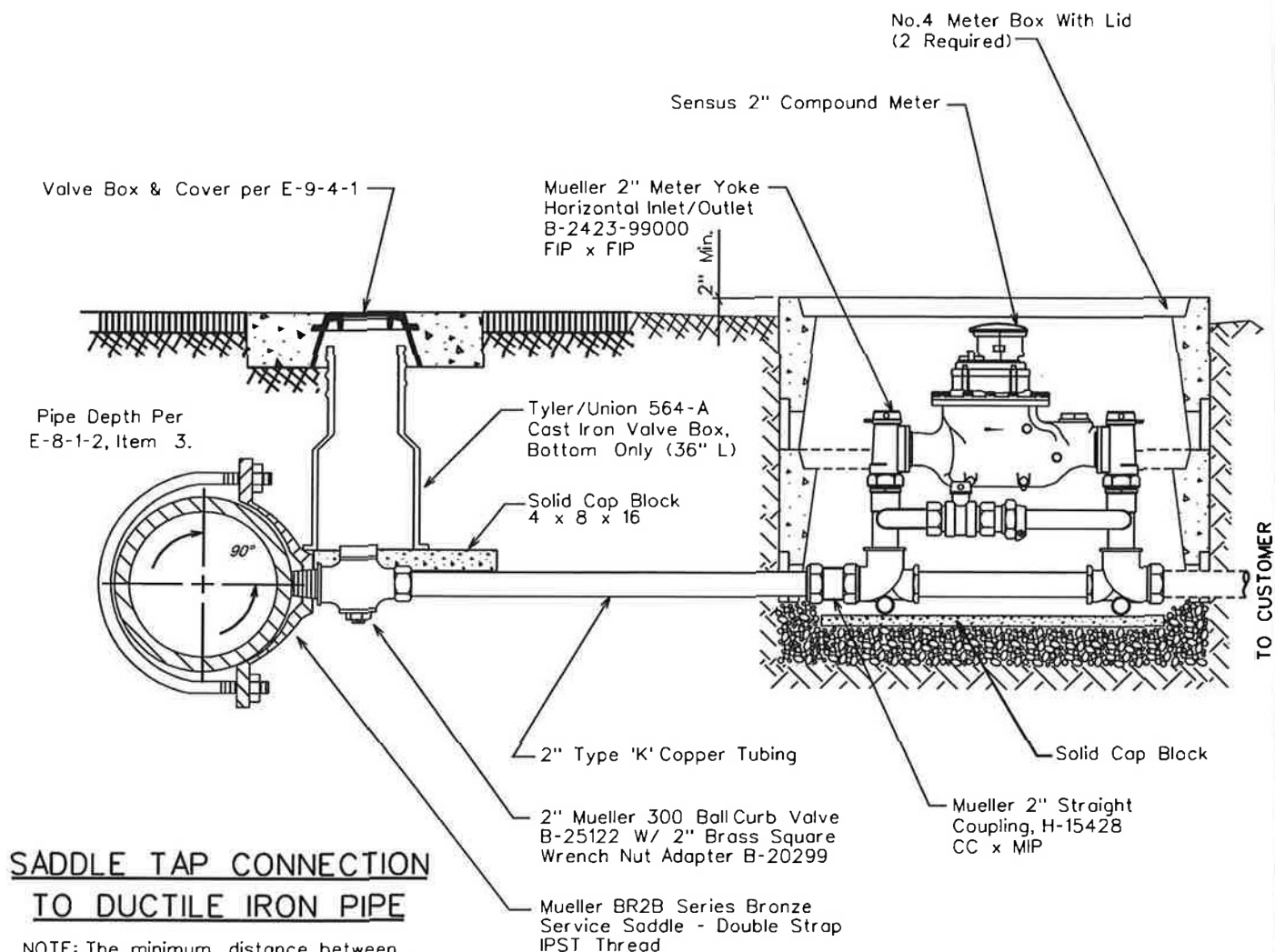
M.W.

DATE:

03.17.2006

△ 08.29.2006

E-9-10-2



SADDLE TAP CONNECTION TO DUCTILE IRON PIPE

NOTE: The minimum distance between service taps on mains other than ductile iron is 12"

NOTE: THE LENGTH OF SERVICE IS LIMITED TO COMMERICALLY AVAILABLE ROLLS, TYPICALLY 60 FEET

NOTE:

Only the meter is supplied by Arizona Water Company

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

TYPICAL 2" SERVICE CONNECTIONS

DRAWN BY:

JW

APPROVED BY:

M.W.

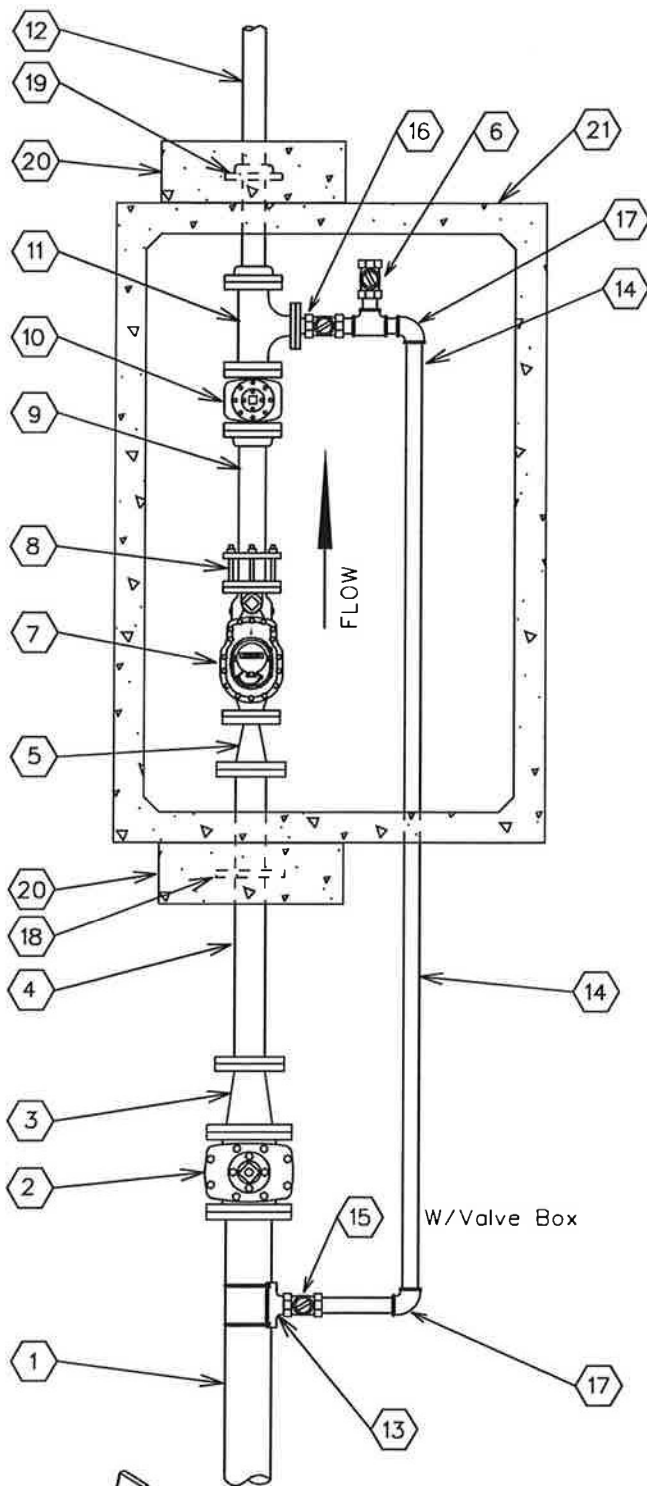
DATE:

3/20/86



08.29.2006

E-9-11-1



No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj x flng
3.	6"x4" Reducer flng x mj
4.	4"x3'-0" D.I.P. Spool flng x pe
5.	4" x 3" Reducer flng
6.	2" Test Port
7.	3" Compound Meter
8.	3" F.C.A.
9.	3"x2'-0" D.I. Spool flng x pe
10.	3" Gate Valve flng
11.	3"x2" Flg Tee w/ 2" Companion Flange
12.	3"x4'-0" D.I. Spool flng x pe
13.	6"x2" Tapping Saddle
14.	2" Copper Pipe
15.	2" Mueller B25122 Ball Valve w/B20299 Nut
16.	2" Locking Ball Valve (normally closed)
17.	2" Mueller H-15526 90° Ell CC x CC
18.	4" Megalug
19.	3" Slip-On Welding Flange
20.	24"x24"x8" Conc. Thrust Block P.I.P.
21.	575-LA Conc. Vault

NOTE:

1. Use Rowley pipe supports or equivalent as needed (See detail below).
2. Pipe support locations to be determined by field personnel.
3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
4. All mechanical joint fittings are to be megalugged.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

3" COMPOUND METER

DRAWN BY:

CCO

APPROVED BY:

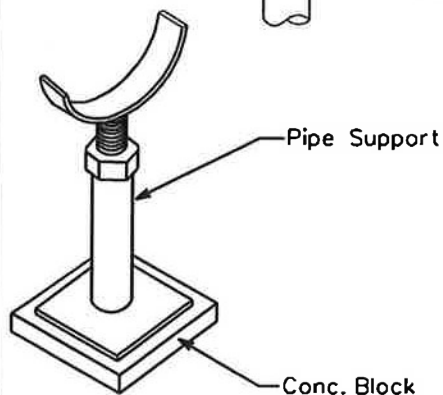
MW

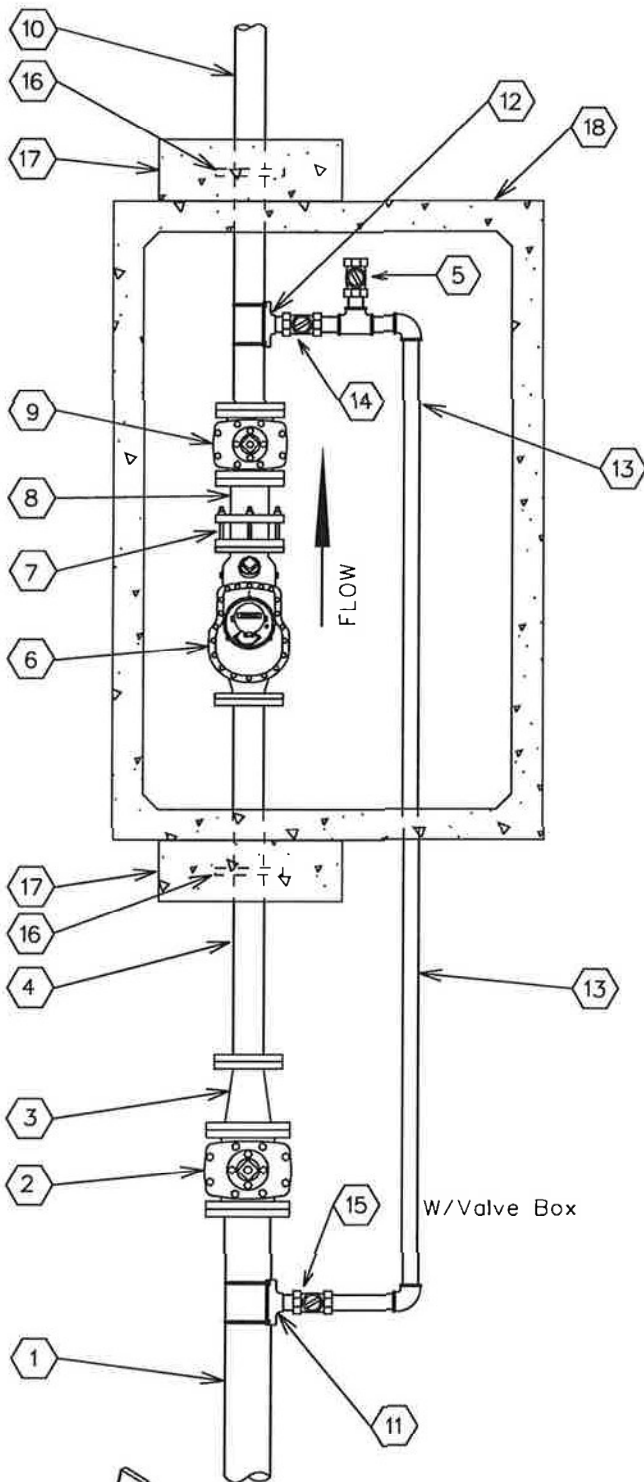
DATE:

10/5/1993

△08.29.2006

E-9-12-1

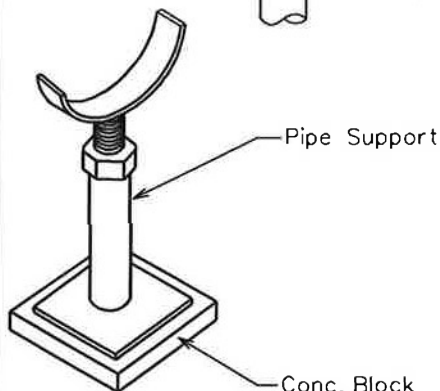




No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj x flng
3.	6"x4" Reducer flng x mj
4.	4"x3'-0" D.I.P. Spool flng x pe
5.	2" Test Port
6.	4" Compound Meter
7.	4" F.C.A.
8.	4"x1'-0" D.I.P. Spool flng x pe
9.	4" Gate Valve flng
10.	4"x4'-0" D.I.P. Spool flng x pe
11.	6"x2" Tapping Saddle
12.	4"x2" Tapping Saddle
13.	2" Copper Pipe
14.	2" Ball Valve / Locking (Normally Closed)
15.	2" Mueller B25122 Ball Valve w/B20299 Nut
16.	4" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.
18.	575-LA Conc. Vault

NOTE:

1. Use Rowley pipe supports or equivalent as needed (See detail below).
2. Pipe support locations to be determined by field personnel.
3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
4. All mechanical joint fittings are to be megalugged.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

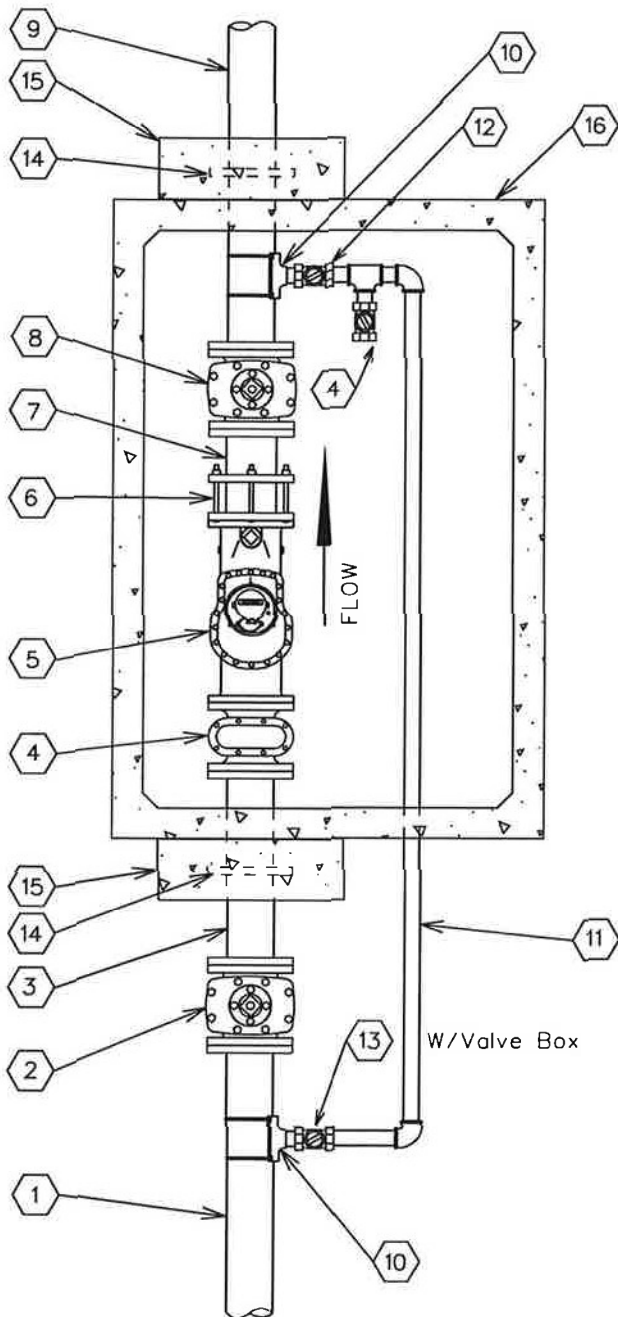


ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

4" COMPOUND METER

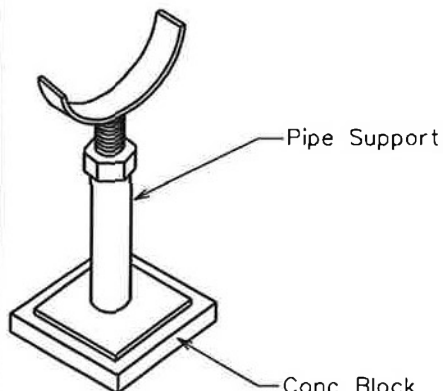
DRAWN BY:	CCO	APPROVED BY:	MW	DATE:	10/5/1993	08.29.2006	E-9-12-2
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No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj
3.	6"x 3'-0" D.I.P. Spool flng x pe
4.	2" Test Port
5.	6" Compound Meter
6.	6" F.C.A.
7.	6"x 1'-0" D.I.P. Spool flng x pe
8.	6" Gate Valve flng
9.	6"x 4'-0" D.I.P. Spool flng x pe
10.	6"x2" Tapping Saddle
11.	2" Copper Pipe
12.	2" Ball Valve / Locking (Normally Closed)
13.	2" Mueller B25122 Ball Valve w/B20299 Nut
14.	6" Megalug
15.	24"x24"x8" Conc. Thrust Block P.I.P.
16.	575-LA Conc. Vault

NOTE:

1. Use Rowley pipe supports or equivalent as needed (See detail below).
2. Pipe support locations to be determined by field personnel.
3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
4. All mechanical joint fittings are to be megalugged.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

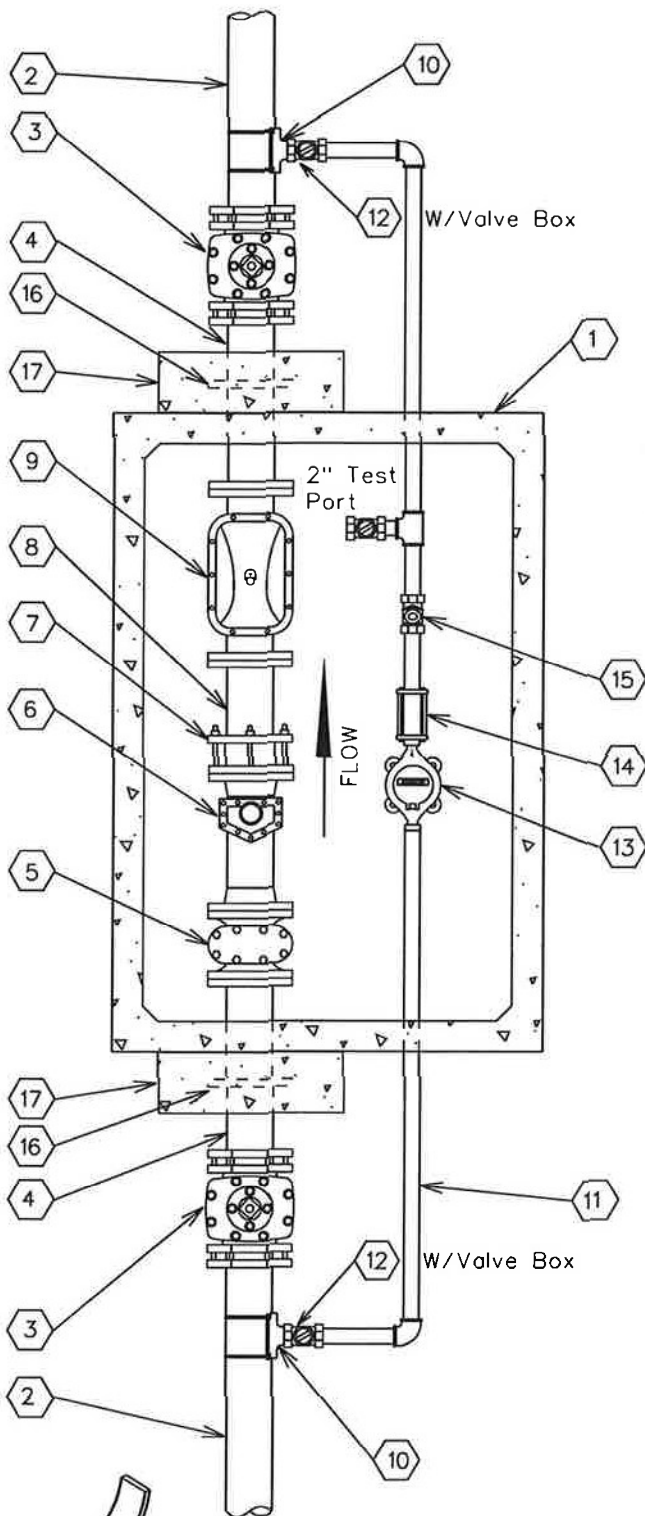


ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

6" COMPOUND METER

DRAWN BY:	CCO	APPROVED BY:	MW	DATE:	10/5/1993	08.29.2006	E-9-12-3
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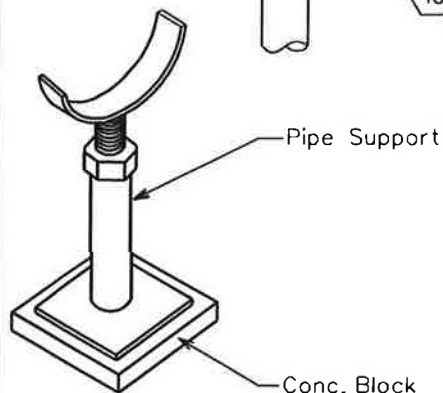


No.	FITTINGS SCHEDULE
1.	575-LA Conc. Vault
2.	6" D.I.P.
3.	6" G.V.B.&C. m.j.
4.	6" x 3'-0" D.I.P. Spool Piece flng x pe
5.	6" Strainer
6.	6" Turbo Meter
7.	6" F.C.A.
8.	6" x 2'-0" D.I.P. Spool Piece flng x pe (TRIM SPOOL PIECE TO 3x THE PIPE DIA.)
9.	6" Detector Check
10.	6"xN" Tapping Saddle
11.	*N" Copper Pipe
12.	*N" Ball Valve (Locking)
13.	*N" Meter
14.	*N" Coup. Adapt.
15.	*N" Flapper Check Valve
16.	6" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.

*N - Size To Be determined By A.W.Co.

NOTE:

1. Use Rowley pipe supports or equivalent as needed (See detail below).
2. Pipe support locations to be determined by field personnel.
3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
4. All mechanical joint fittings are to be megalugged.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).
6. To change from a 6" service to a 4" service, change all listed 6" materials to 4" materials.



ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

6" COMPOUND SERVICE

DRAWN BY:

CCO

APPROVED BY:

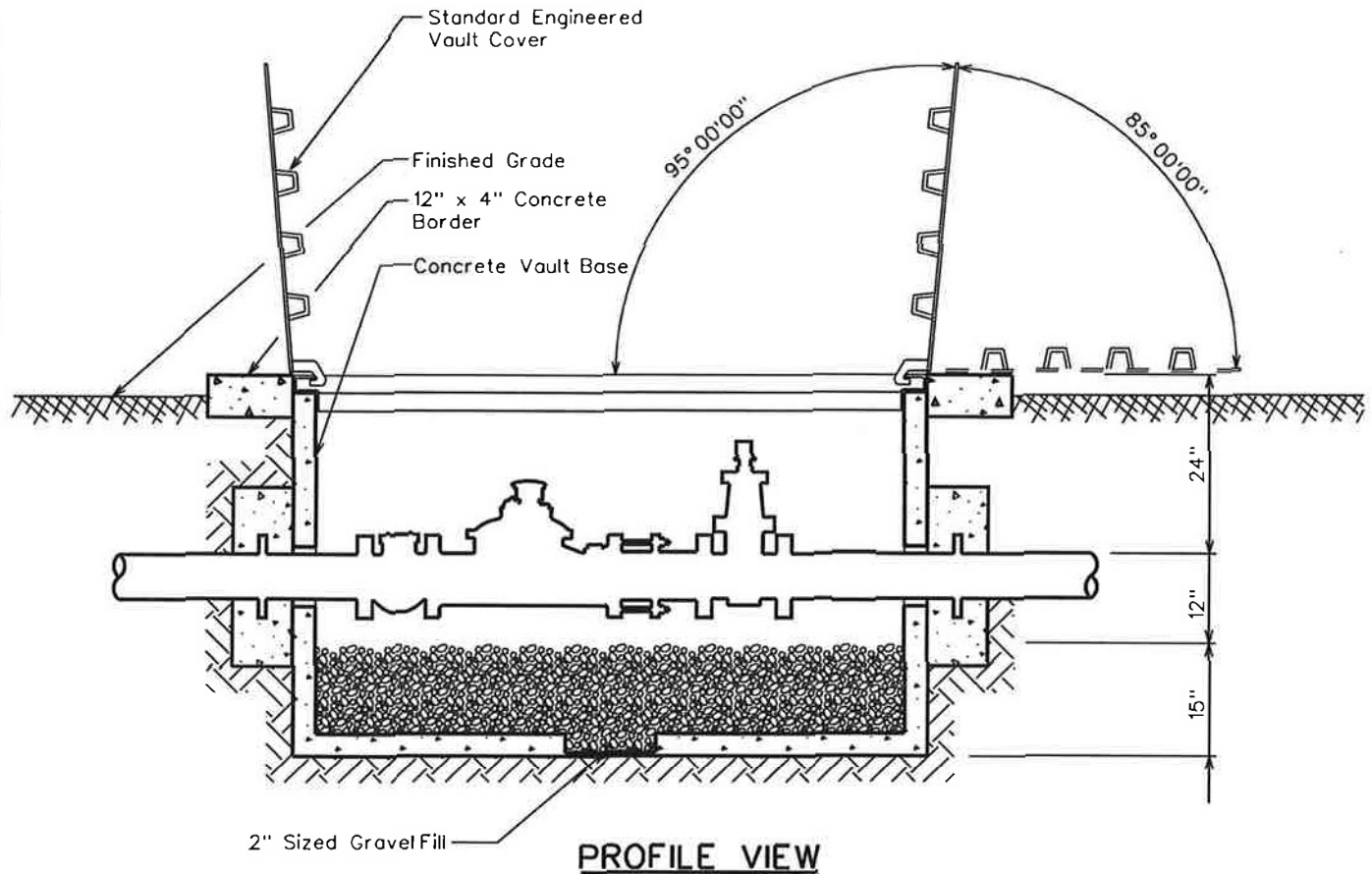
MW

DATE:

10/05/1993

△08.29.2006

E-9-12-4



CONCRETE VAULT & COVER SPECIFICATIONS

Vault - Base No. 575-BL
 Cover - Standard Engineered Vault Cover
 . 4874 Aluminum Diamond Plate Cover
 For Non-Traffic Loading Areas
 Or
 . 4874 Galvanized Steel Diamond Plate
 Cover W/ H-20 Traffic Loading
 . Double Torsion Spring Assisted Doors W/
 Recessed Hasp & Safety Latches

NOTES

1. Total Depth Of Concrete Vault To Be A Maximum Of 3'-0" From Top Of Vault Cover To Top Of Gravel Fill.
2. Service Connections Larger Than 6" In Diameter Will Conform To The Same Vault & Cover Specifications. Size Of Vault & Cover To Be Determined By A.W.Co. Engineers.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
 FOR THE INSTALLATION OF

CONCRETE VAULT

DRAWN BY:

CCO

APPROVED BY:

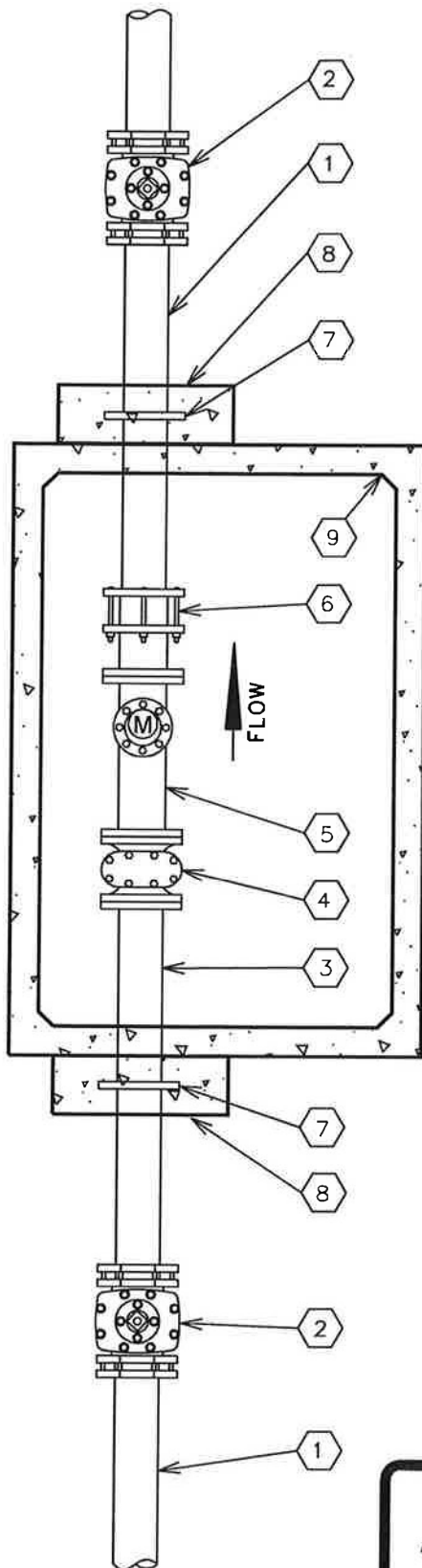
MW

DATE:

10/5/1993

△ 05.17.2001

E-9-12-5



No.	FITTINGS SCHEDULE
1.	Ductile Iron Pipe
2.	Gate Valve M.J.
3.	D.I.P. Spool Piece Flg x Pe (10xDia.)
4.	Meter Strainer
5.	Propeller Meter
6.	Flanged Coupling Adapter
7.	Megalug Gland (Thrust Anchor)
8.	Concrete Thrust Block P.I.P.
9.	Concrete Vault

NOTE:

1. Use Rowley pipe supports or equivalent as needed (See E-9-12-4).
2. Pipe support locations to be determined by field personnel.
3. All Sched. 40 Stl. pipe outside of vault to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
4. All mechanical joint fittings to are to be megalugged.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

NON-POTABLE PROPELLER METER

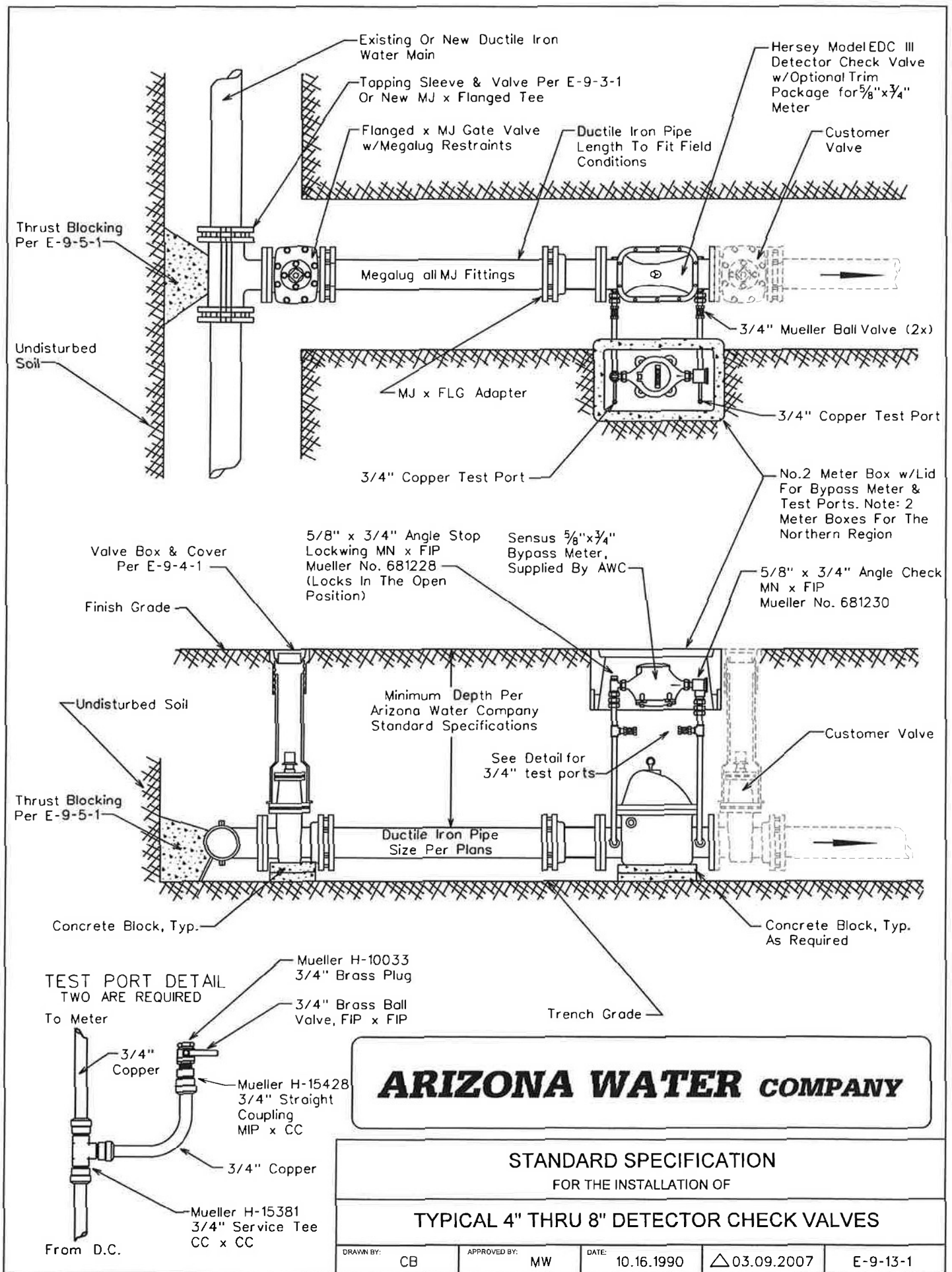
DRAWN BY: JPK

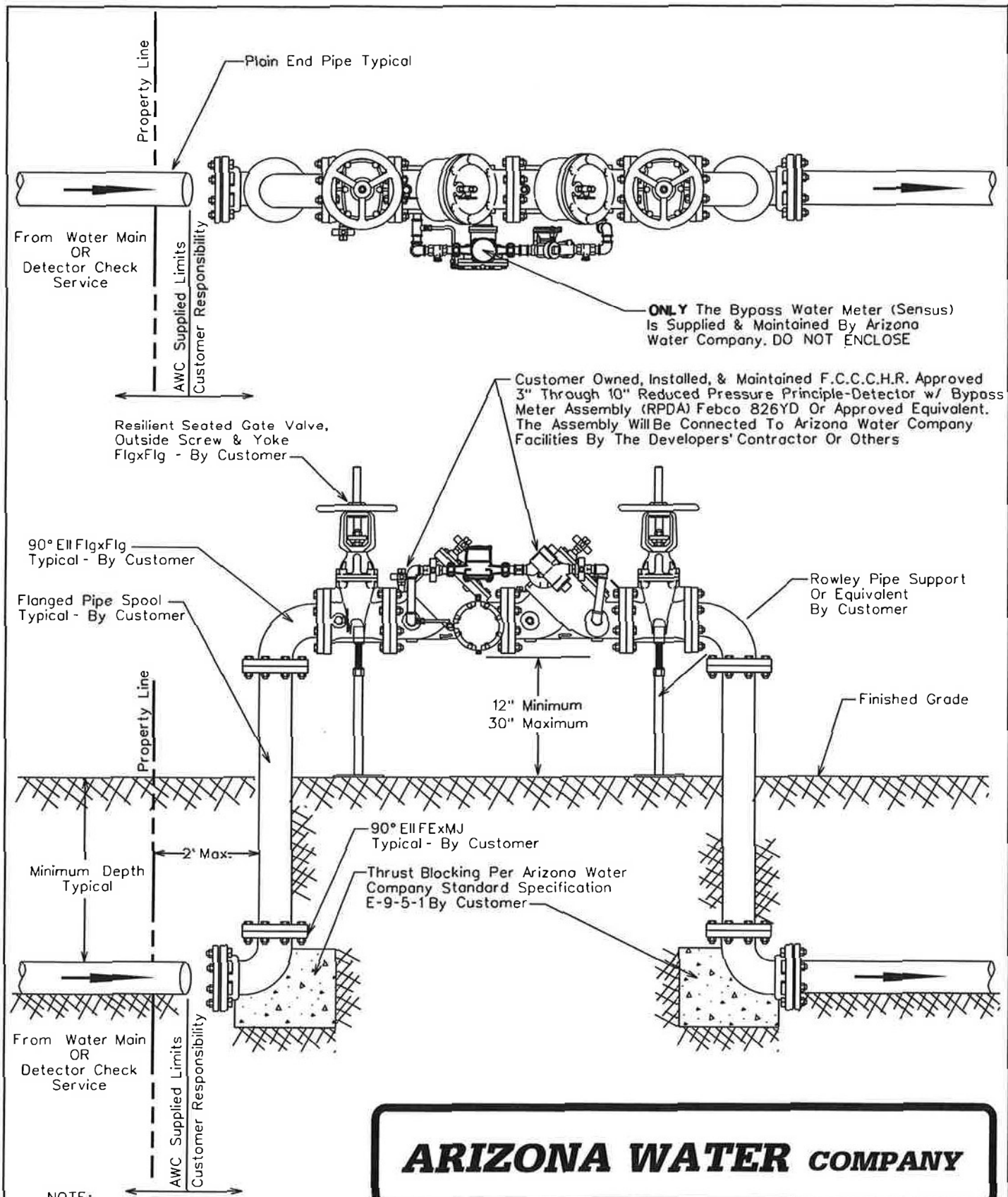
APPROVED BY: MW

DATE: 7-20-95



E-9-12-6





Minimum Depth Of Cover Over
6" & 8" Mains is 36 Inches,
12" & Greater is 48 Inches
Unless Otherwise Specified

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

3" THRU 10" REDUCED PRESSURE PRINCIPLE-DETECTOR
WITH BYPASS METER ASSEMBLY (RPDA) FOR FIRELINE SERVICES

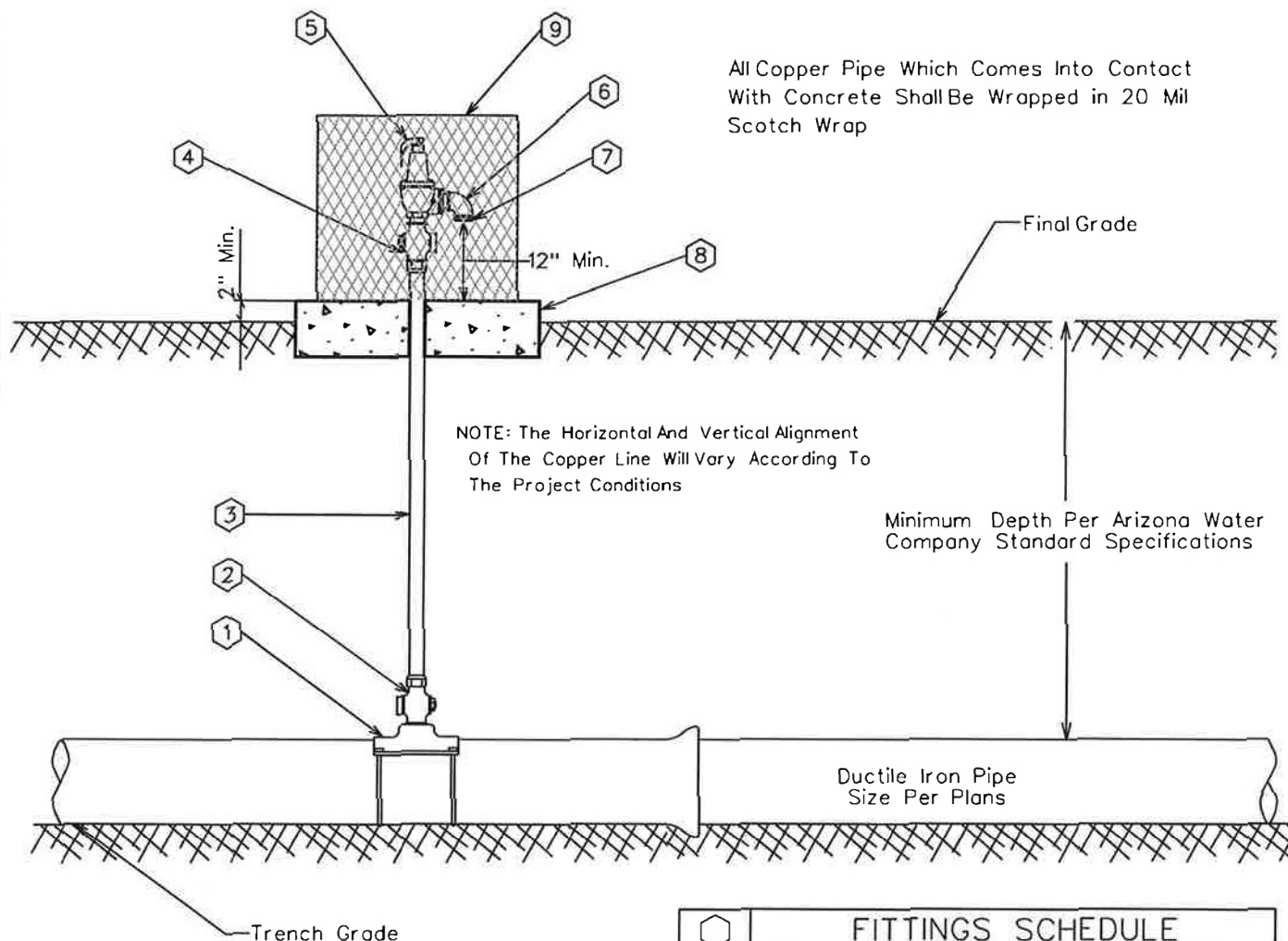
DRAWN BY: CB

APPROVED BY: MW

DATE: 10-13-98

△ 1-19-2000

E-9-13-2



NOTE:

1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.
2. The relief valve assembly and vandal enclosure shall be located out of the roadway, but within the right-of-way or easement.

⬡	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'K' Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Vandal enclosure to be centered on the concrete pad

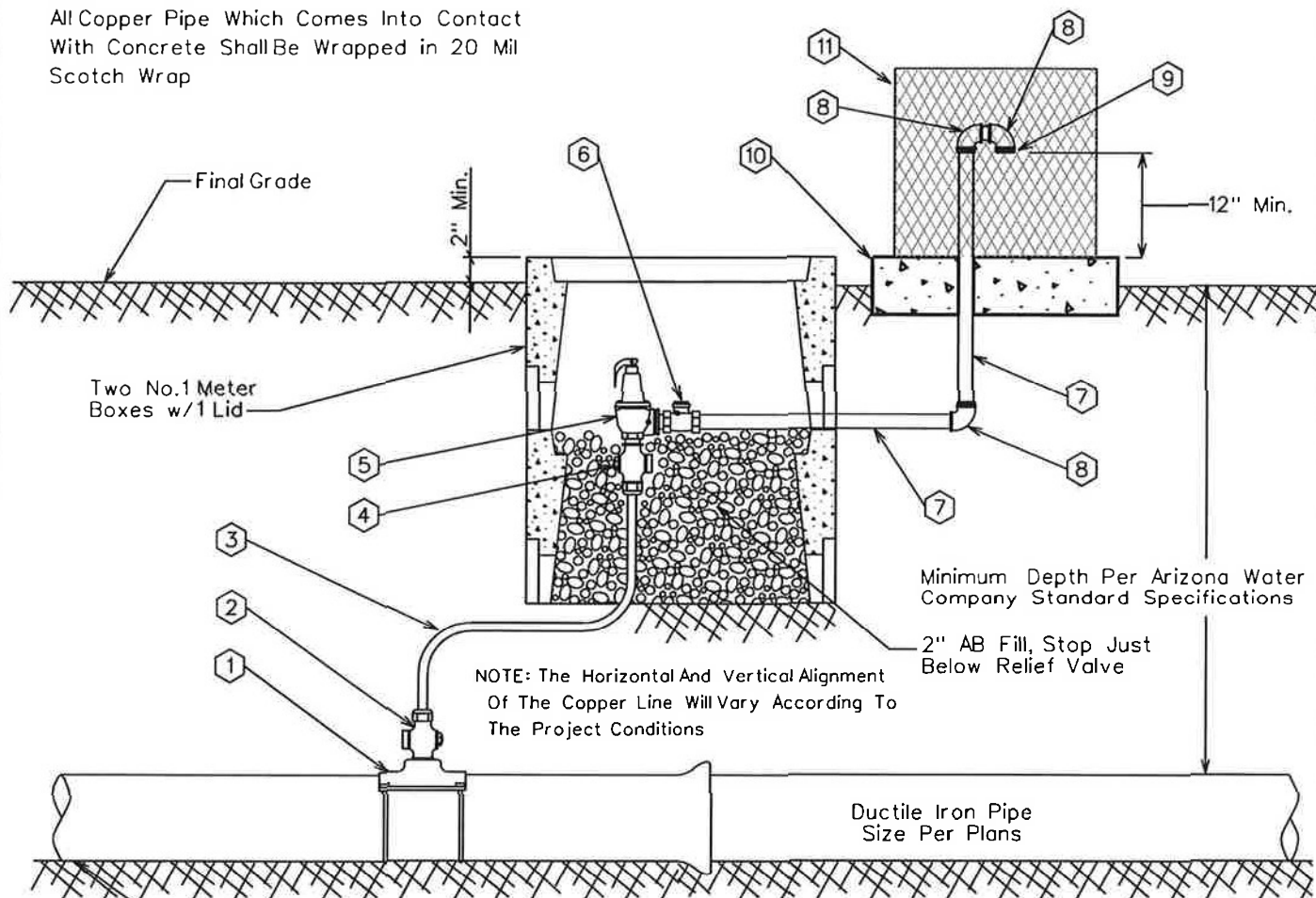
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

TYPICAL PRESSURE RELIEF VALVE ASSEMBLY

DRAWN BY: CCO	APPROVED BY: MW	DATE: 3/20/1986	△ 08.29.2006	E-9-14-1
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All Copper Pipe Which Comes Into Contact With Concrete Shall Be Wrapped in 20 Mil Scotch Wrap



NOTE: Trench Grade

1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.
2. The relief valve assembly and vandal enclosure shall be located out of the roadway, but within the right-of-way or easement.

⬡	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'M' Rigid Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Bronze Check Valve Watts Series CV
7.	2" Schedule 40 Cut Pipe - Field Fit
8.	2" Brass Street Elbow
9.	No.16 Wire Mesh Screen (Non-Corrodible)
10.	4" Thick Concrete Pad - Class 'C' Concrete
11.	Guardshack, Model GS-1, Available From BPD, Inc. Available In Leaf Green Or Desert Tan

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

PRESSURE RELIEF VALVE - NORTHERN REGION

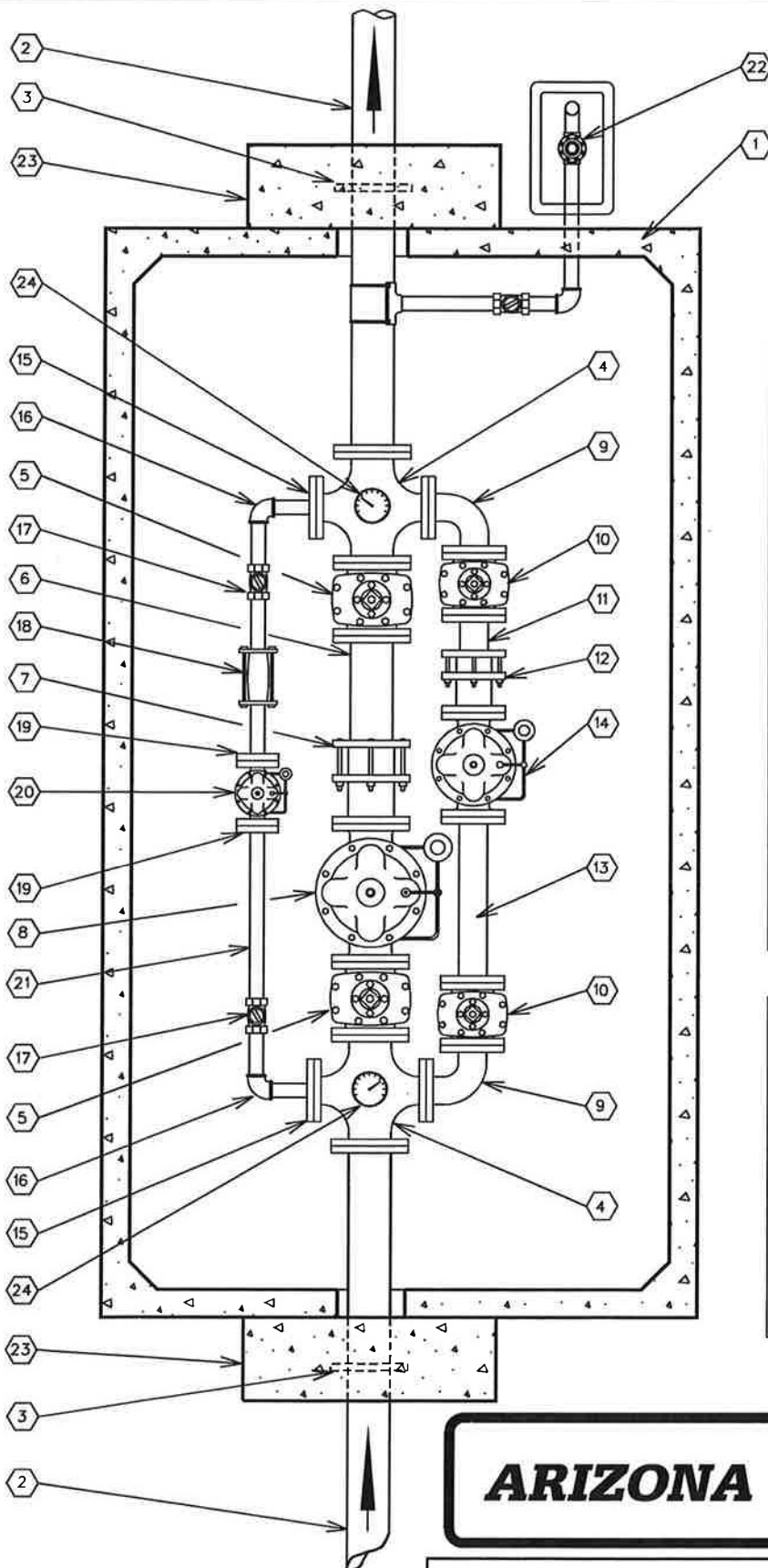
DRAWN BY: CCO

APPROVED BY: MW

DATE: 3/20/1986

08.29.2006

E-9-14-2



No.	FITTINGS SCHEDULE
1.	612 LA Conc. Vault (See Note 3)
2.	6"x6'-0" D.I.P. Spool Flg.xP.E.
3.	6" Megalug (Thrust Anchor)
4.	6"x4" Cross Flg.
5.	6" Gate Valve Flg.
6.	6"x2'-0" D.I.P. Spool Flg.xP.E.
7.	6" Flg. Coup. Adapt. (Rockwell 913)
8.	6" High Flow Pressure Reducing Valve Flg.
9.	4" 90° Ell. Flg.
10.	4" Gate Valve Flg.
11.	4"x1'-0" D.I.P. Spool Flg.xP.E.
12.	4" Flg. Coup. Adapt. (Rockwell 913)
13.	4"x2'-0" D.I.P. Spool Flg.
14.	4" Medium Flow Pressure Reducing Valve Flg.
15.	2"x9" O.D. Reducing Flg. (I.P.T.)
16.	2" 90° Ell. F.I.P.
17.	2" Ball Valve F.I.P.
18.	2" Comp. Coup. (Rockwell 411)
19.	2" Companion Flg. (I.P.T.)
20.	2" Low Flow Pressure Reducing Valve Flg.
21.	2" Sched. 40 Std. Pipe
22.	2" Pressure Relief Valve (See E-9-14-1)
23.	12"x36"x36" Conc. Thrust Block P.I.P.
24.	Pressure Gauge w/shut off valve

NOTE:

1. Use Rowley pipe supports or equivalent as needed. (See E-9-12-4)
2. Pipe support locations to be determined by field personnel.
3. Vault-612 LA top section w/12" Dia. sump hole. Cover-concrete slab top w/(4) 4'-0" x2'-6" aluminum spring loaded hinged style covers for non-traffic loading areas. For areas w/low density traffic, cover is to be designed for H-20 traffic loading.
4. All Sched. 40 Std. pipe outside of vault to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

PRESSURE REDUCING STATION

DRAWN BY:

JPK

APPROVED BY:

MW

DATE:

11-16-88

△ 9-27-95

E-9-15-1

1. Specific Items To Be Painted Deer-O Pure White Enamel:

- A. All Booster Pumps.
- B. All Electrical Motors And Gas Engines.
- C. Well Pump Discharge Heads.
- D. Electrical Panel.

2. Specific Items To Be Painted Frost Cap White Or Deer-O Pure White Enamel:

- A. Well Shelter.

3. Specific Items To Be Painted OSHA Orange:

- A. Electrical Conduit.

4. All Other Items To Be Painted With Either:
(At Manager's Discretion)

- A. Cholla Green
- B. Forest Green
- C. Sonora Beige
- D. Red Rock
- E. Rock Brown
- F. Deer-O Pure White
- G. Elkhorn Cactus

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

PAINT COLOR SELECTION

DRAWN BY: CCO

APPROVED BY:

DATE: 3/20/1986

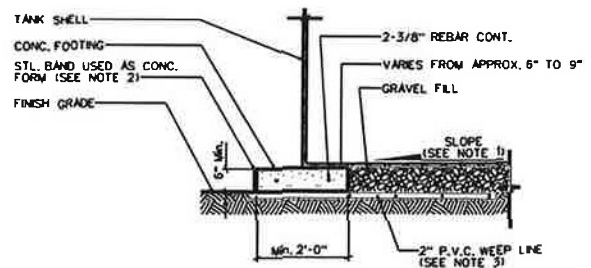
△ 2/13/2001

E-9-16-1

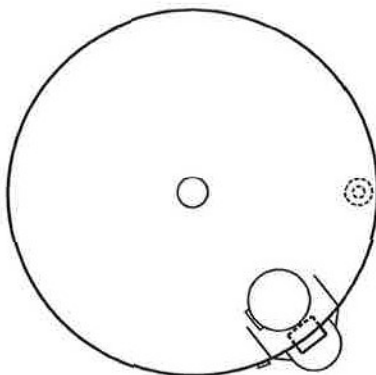
1. Tank shall conform to AWWA Specification D100-84 with exceptions noted below.
 2. $\frac{1}{4}$ " minimum shell plate.
 3. Minimum of 12" diameter roof vent, screened with No. 16 non-corrodible wire mesh, to be located on a 24" diameter round hinged manhole opening at the center of the tank to provide access to the dollar plate.
 4. Overflow pipe shall be the same diameter as the inlet pipe and shall terminate 12 to 24 inches above splash pad or a minimum of 2 overflow pipe diameters above weir box high water level.
 5. Storage tank shall be placed upon adequately compacted base material.
 6. 6" minimum floor mounted tank drain outlet to be located close to the outer shell.
 7. Tank and related fittings shall be enclosed with a 6 foot chain link fence with lockable gates and anti-personnel wire on top of fence.
 8. Liquid level shall be indicated by a target and target board on the outside surface of the tank.
 9. 24 inch diameter manholes shall be provided on the roof and on the shell near the bottom of the tank. The roof manhole cover shall overlap the manhole by at least 2 inches to provide a rain tight closure. Roof manhole shall be hinged and equipped with a lock. Shell manhole cover to be hinged and bolted in place. Tanks larger than a 60 foot diameter require 2 shell manholes.
 10. Inside and outside ladders shall be located at the roof manhole. Outside ladder shall be caged with locking trap door. Bottom 8 feet of cage shall be enclosed to within $\frac{1}{2}$ " of shell with 10 gauge sheet steel.
 11. Finished tank shall be disinfectant in accordance with Arizona Department of Health Services Engineering Bulletin No. 8 before being placed into service.
 12. The following information will be included with application for approval to construct:
 1. Tank location _____
 2. Tank height _____
 3. Tank diameter _____
 4. Tank capacity _____
 5. Method of water level control _____
 13. The storage tank will not be constructed within the 100 year flood plain and the tank site will be graded to slope away from the tank.
 14. The welded steel storage tank will be coated as per AWWA Specification D102, and N.S.F. Standard 51.
- *Exceptions to AWWA Specification D100-84

FOUNDATION NOTES

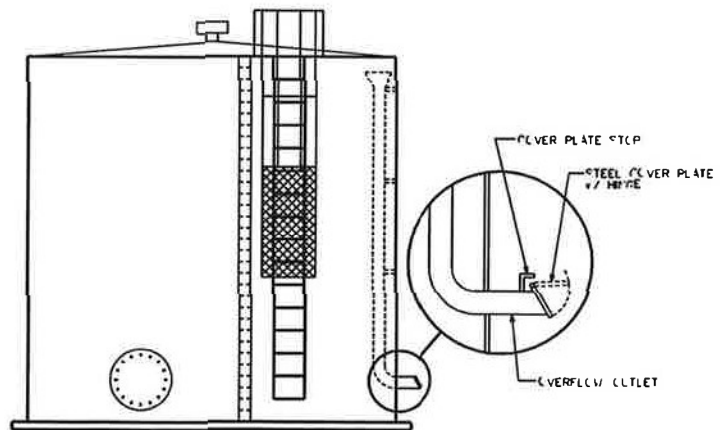
1. FINISH CONCRETE SURFACE MUST SLOPE UPWARDS FROM THE STEEL BAND APPROX. 1" IN 10'-0".
2. TOP OF STEEL BAND MUST BE MAINTAINED LEVEL TO WITHIN $\frac{1}{8}$ ".
3. INSTALL 8-2" DIA. x 10'-0" P.V.C. WEEP LINES, EQUALLY SPACED (EVERY 45°). PERFORATE 8'-0" OF LINE WITH $\frac{1}{2}$ " DIA. HOLES @ 6" O.C. PLUG INTERIOR END OF LINE w/ 2" CAP.



FOUNDATION DETAIL



PLAN VIEW



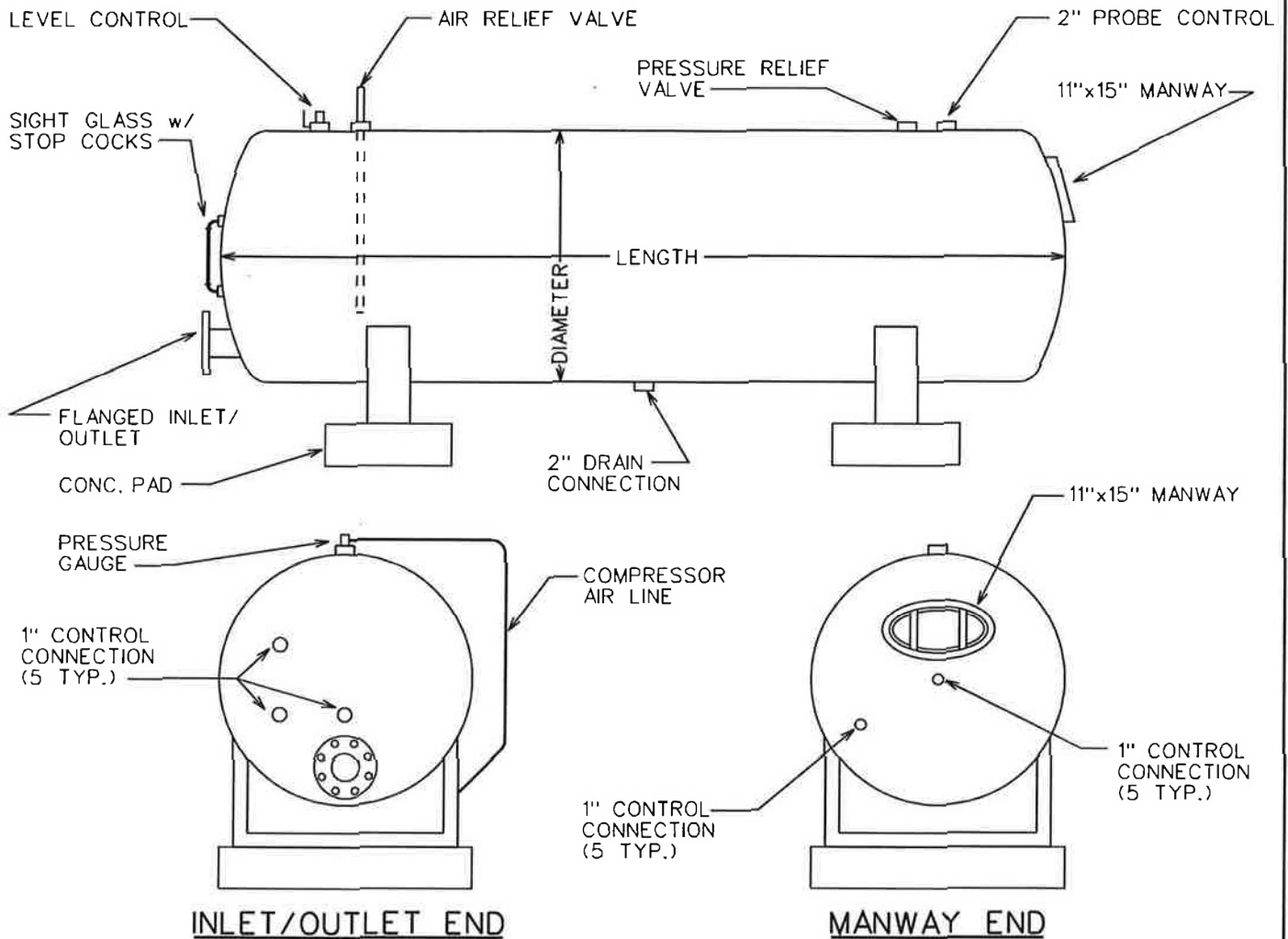
PROFILE VIEW

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

STEEL WATER STORAGE TANK

DRAWN BY: JPK	APPROVED BY: MJW	DATE: 10-17-88	2-12-96	E-9-17-1
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1. ALL HYDROPNEUMATIC TANKS SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE ASME CODE FOR UNFIRED PRESSURE VESSELS, SECTION VIII, DIVISION 1.
2. FINISHED TANK SHALL BE DISINFECTED IN ACCORDANCE WITH ADEQ BULLETIN No. 8 BEFORE BEING PLACED INTO SERVICE.
3. THE WELDED STEEL HYDROPNEUMATIC TANK WILL BE COATED AS PER AWWA SPECIFICATION D102 & NSF STANDARD 61.
4. THE FOLLOWING INFORMATION WILL BE INCLUDED WITH THE APPLICATION FOR APPROVAL TO CONSTRUCT.

1. Tank Location _____
2. Tank Length _____
3. Tank Diameter _____
4. Tank Capacity _____
5. Maximum Working Pressure _____

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

HYDROPNEUMATIC TANK

DRAWN BY:

JPK

APPROVED BY:

MW

DATE:

3-20-1986

△ 01.16.2007

E-9-18-1

NOT
CONVERTED
TO
CAD

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

WELL SHELTER

DRAWN BY:

CB

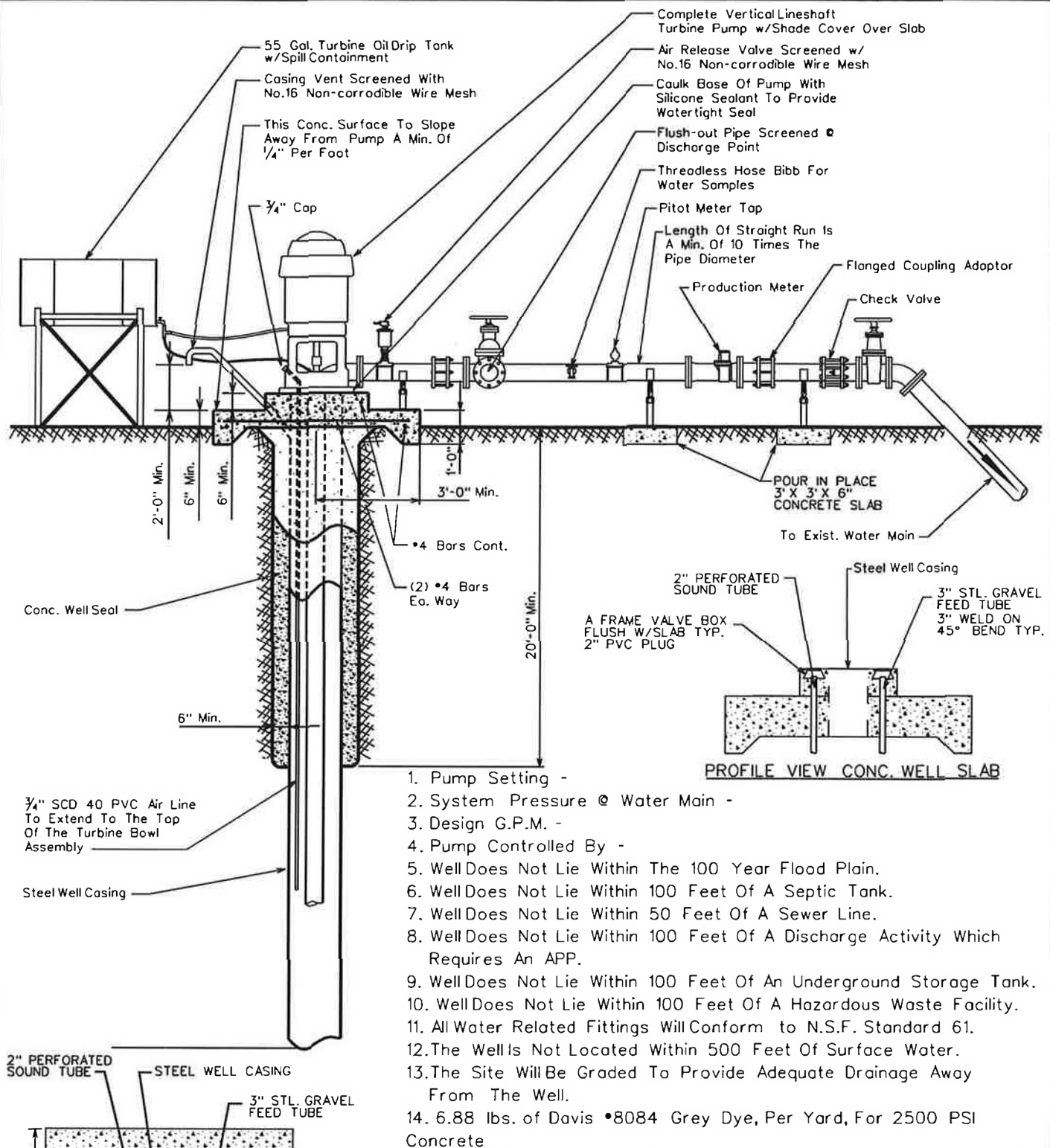
APPROVED BY:

DATE:

03.20.1986

△ 04.03.2001

E-9-19-1



ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

TYPICAL WELL W/ LINESHAFT TURBINE PUMP

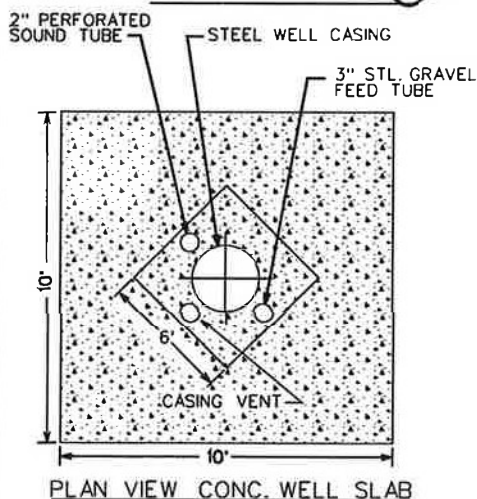
DRAWN BY: JW

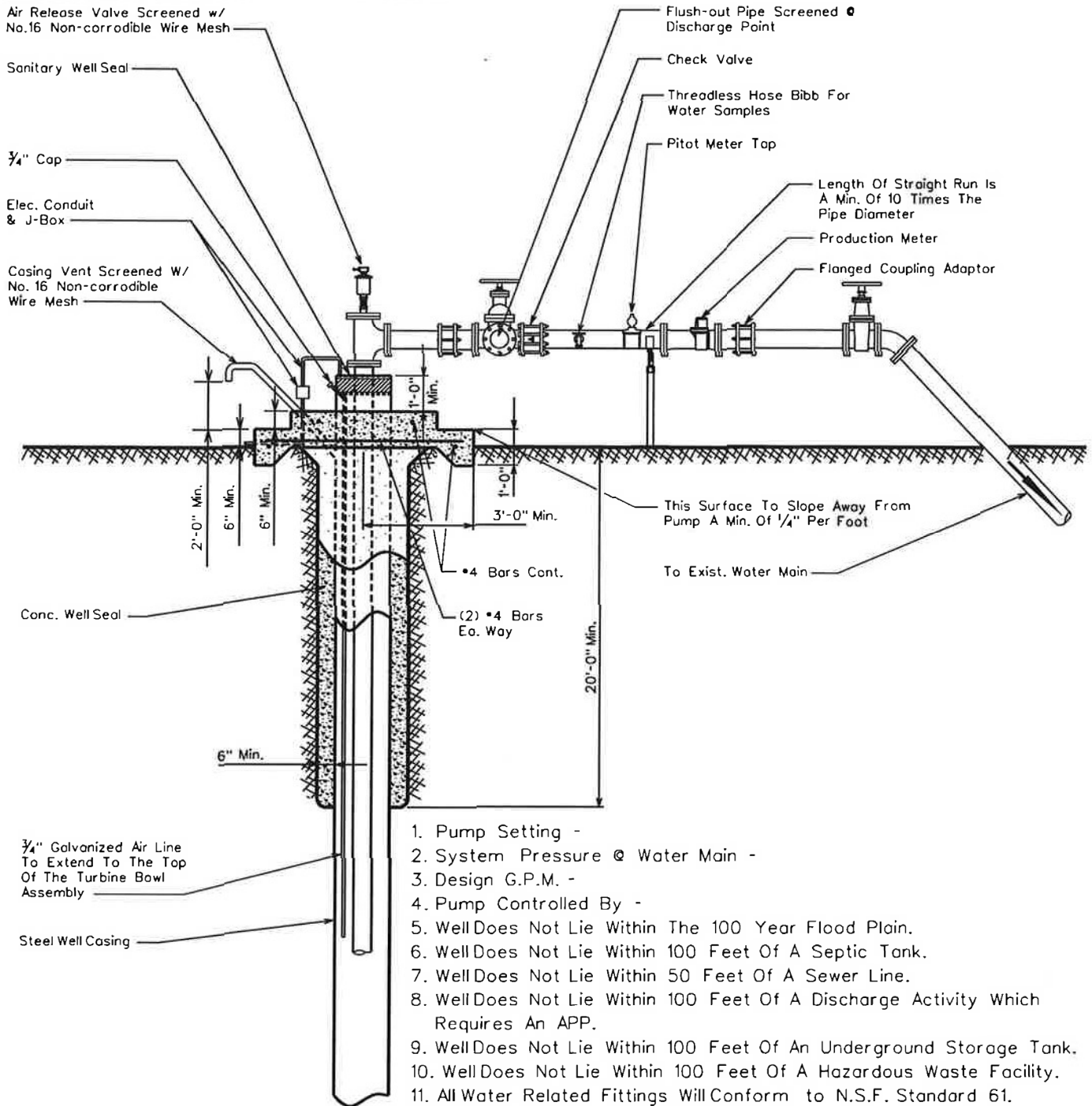
APPROVED BY: M.W.

DATE: 3-20-86

9/15/04

E-9-20-1



**ARIZONA WATER COMPANY**

STANDARD SPECIFICATION FOR THE INSTALLATION OF

TYPICAL WELL W/ SUBMERSIBLE TURBINE PUMP

DRAWN BY:

ipk

APPROVED BY:

M. W.

DATE:

3-20-86

 \wedge

2-16-01

F-9-21-1

All New Purchases To Conform To The Following:

Column Pipe

4" I.D. - 8	Threads Per Inch Tapered	$\frac{3}{4}$ "	Per Foot	Right Hand					
6" I.D. - 8	"	"	"	"	"	"	"	"	"
8" I.D. - 8	"	"	"	"	"	"	"	"	"
10" I.D. - 8	"	"	"	"	"	"	"	"	"
12" I.D. - 8	"	"	"	"	"	"	"	"	"
14" I.D. - 8	"	"	"	"	"	"	"	"	"

Oil Tube - Peerless Type

1 $\frac{1}{2}$ "	O.D. - 14	Threads Per Inch	Right Hand			
2"	O.D. - 12	"	"	"	"	"
2 $\frac{1}{2}$ "	O.D. - 10	"	"	"	"	"
3"	O.D. - 10	"	"	"	"	"
3 $\frac{1}{2}$ "	O.D. - 10	"	"	"	"	"
4"	O.D. - 10	"	"	"	"	"

Line Shaft

$\frac{3}{4}$ "	O.D. - 10	Threads Per Inch	Left Hand			
1"	O.D. - 14	"	"	"	"	"
1- $\frac{3}{16}$ "	O.D. - 10	"	"	"	"	"
1- $\frac{1}{2}$ "	O.D. - 10	"	"	"	"	"
1- $\frac{11}{16}$ "	O.D. - 10	"	"	"	"	"
1- $\frac{15}{16}$ "	O.D. - 10	"	"	"	"	"
2- $\frac{3}{16}$ "	O.D. - 10	"	"	"	"	"
2- $\frac{7}{16}$ "	O.D. - 8	"	"	"	"	"

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

COLUMN PIPE, OIL TUBE AND LINE SHAFT

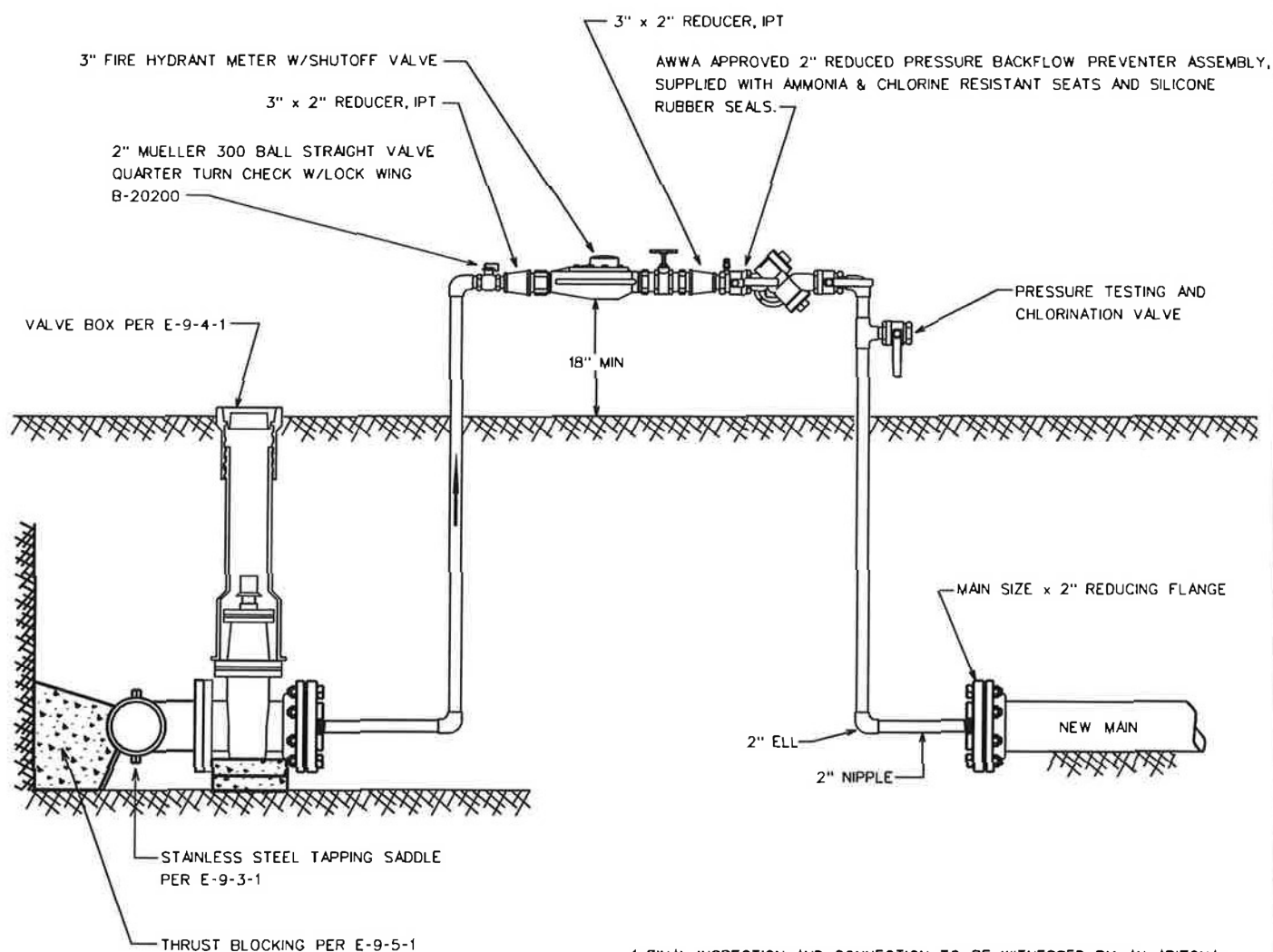
DRAWN BY: CCO

APPROVED BY:

DATE: 3/20/1996

△ 2/13/2001

E-9-22-1



1. FINAL INSPECTION AND CONNECTION TO BE WITNESSED BY AN ARIZONA WATER COMPANY REPRESENTATIVE.
2. REDUCING FLANGES TO BE PROPERLY RESTRAINED.
3. INSTALL JUMPER TAP FOR TEMPORARY METER DOWNSTREAM OF THE REDUCING FLANGE FOR PRESSURE AND BACTEE TESTING.
4. JUMPER ASSEMBLY MUST BE A MINIMUM OF 18" ABOVE FINISHED GRADE.
5. BACKFLOW ASSEMBLY REQUIRES CERTIFICATION.
6. ASSEMBLY NOT TO BE REMOVED AND SPOOL PIECE INSTALLED FOR FINAL CONNECTION UNTIL ALL TESTING, BACTERIAL CLEARANCE AND FINAL INSPECTIONS HAVE BEEN OBTAINED.
7. ALL NEW PIPING SHALL BE PROPERLY RESTRAINED.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

HOT TAP & JUMPER METER CONNECTION

DRAWN BY:

CB

APPROVED BY:

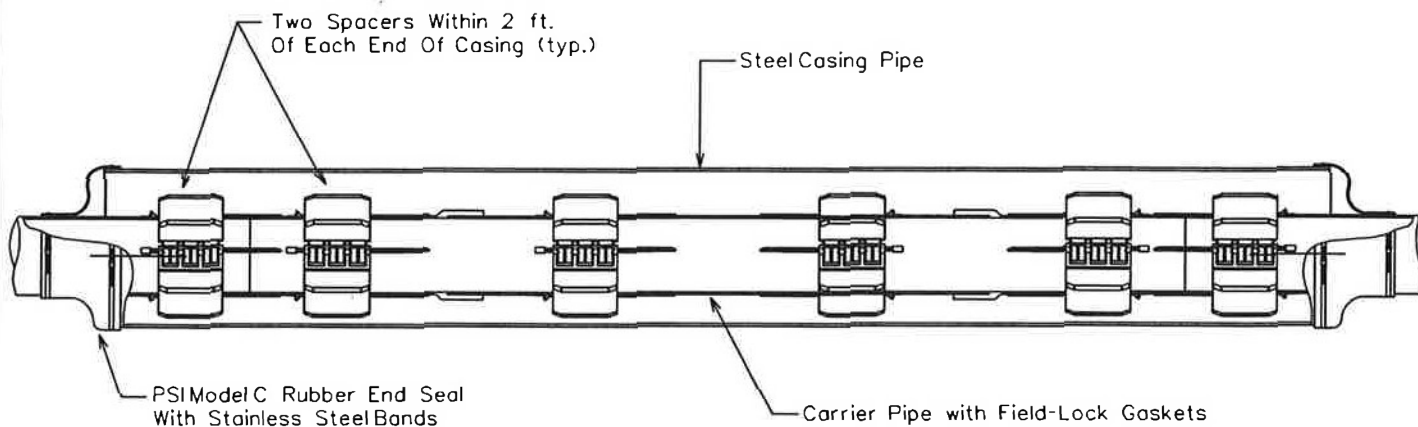
MJW

DATE:

05.14.2004

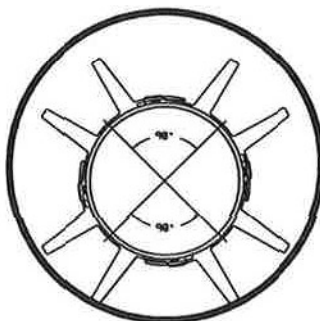


E-9-23-1



C R O S S S E C T I O N

The casing spacers shall be the PSI Ranger II Casing Spacers as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.



S E C T I O N C U T

End Seals

After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals equal to the PSI Model "C" end seals as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

NOTE: The Carrier Pipe Shall Be Polywrapped Prior To The Skid Installation & Insertion Into The Carrier Casing For Divisions Requiring Polywrapped Pipe.

*Thickness Of Skid To Extend A Minimum of 1/2" Above The O.D. Of The Pipe Bell or Gland.

OD Push On Joint Bell	OD M.J. BELL
6" - 8.66"	6" - 11.12"
8" - 10.82"	8" - 13.37"
12" - 15.05"	12" - 17.94"
16" - 19.74"	16" - 22.56"
20" - 23.98"	20" - 27.08"
24" - 28.16"	24" - 31.58"
30" - 35.40"	30" - 39.12"
36" - 41.84"	36" - 46.00"
48" - 55.94"	48" - 60.00"

PIPE SIZE	CASING SIZE	CASING SIZE ID	CASING SCHEDULE	WALL THICKNESS	SKID SIZE
6"	16"	15.25"	STD.	.375	*x4x12
8"	18"	18.25"	STD.	.375	*x4x12
12"	22"	21.25"	STD.	.375	*x4x12
16"	28"	27.25"	STD.	.375	*x4x12
20"	32"	31.25"	STD.	.375	*x4x12
24"	36"	35.25"	STD.	.375	*x4x12
30"	48"	47.25"	STD.	.375	*x4x12
36"	54"	53.25"	STD.	.375	*x4x12
48"	66"	65.25"	STD.	.375	*x4x12

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL WATER LINE ENCASEMENT

DRAWN BY:

CB

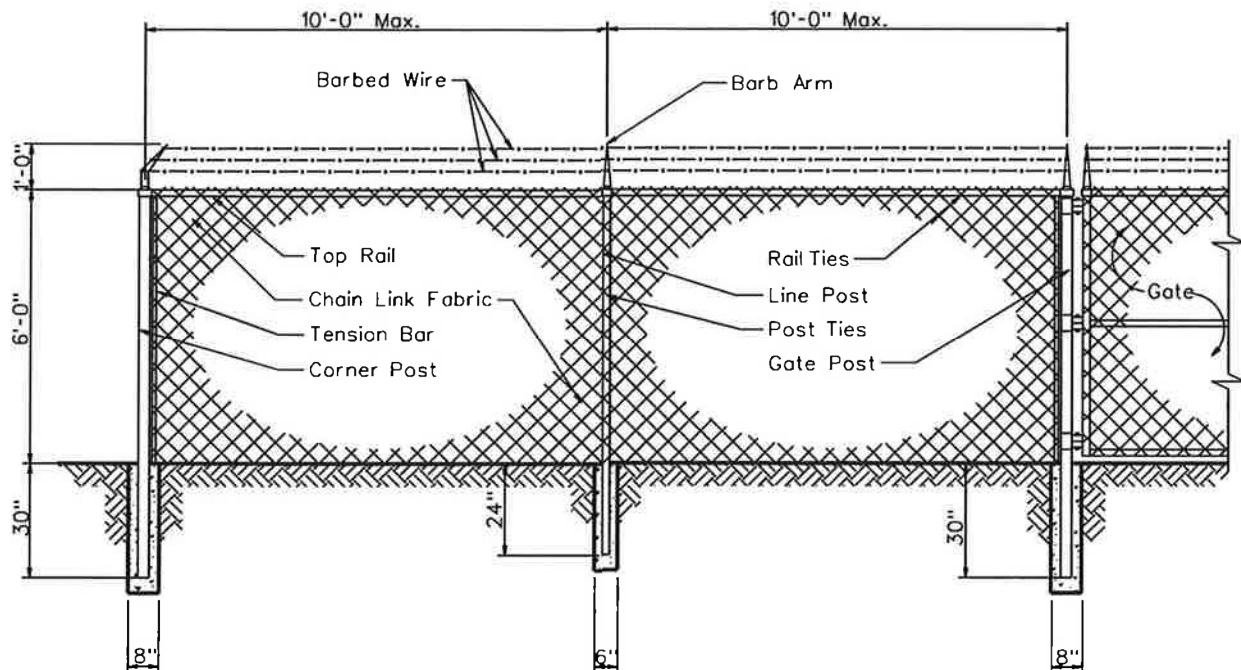
APPROVED BY:

DATE:

3/20/1996

△ 09.27.2006

E-9-24-1



Line Post:	1-7/8" O.D.	1.74 lbs. P/L.F.	ASTM A-256
End Post:	2-7/8" O.D.	4.64 lbs. P/L.F.	ASTM A-256
Corner Post:	2-7/8" O.D.	4.64 lbs. P/L.F.	ASTM A-256
Gate Post:	2-7/8" O.D.	4.64 lbs. P/L.F.	ASTM A-256
Top Rail:	1-5/8" O.D.	4.64 lbs. P/L.F.	ASTM A-256
Chain Link Fabric:	9 Ga. 2" Mesh Galv. Before Weave		
Selvage:	Barb/Knuckle		
Fittings:	Pressed Steel		
Barb Wire:	2-1/2 Ga./2 Point		
Barb Arm:	1 Piece/45° Arm		
Tension Wire:	9 Ga./Galv.		
Line Post Set:	6"x24" In Concrete		
Terminal Post Set:	8"x30" In Concrete		

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

CHAIN LINK FENCE

DRAWN BY:

CCO

APPROVED BY:

MW

DATE:

7/7/1992

△

2/9/2001

E-9-26-1

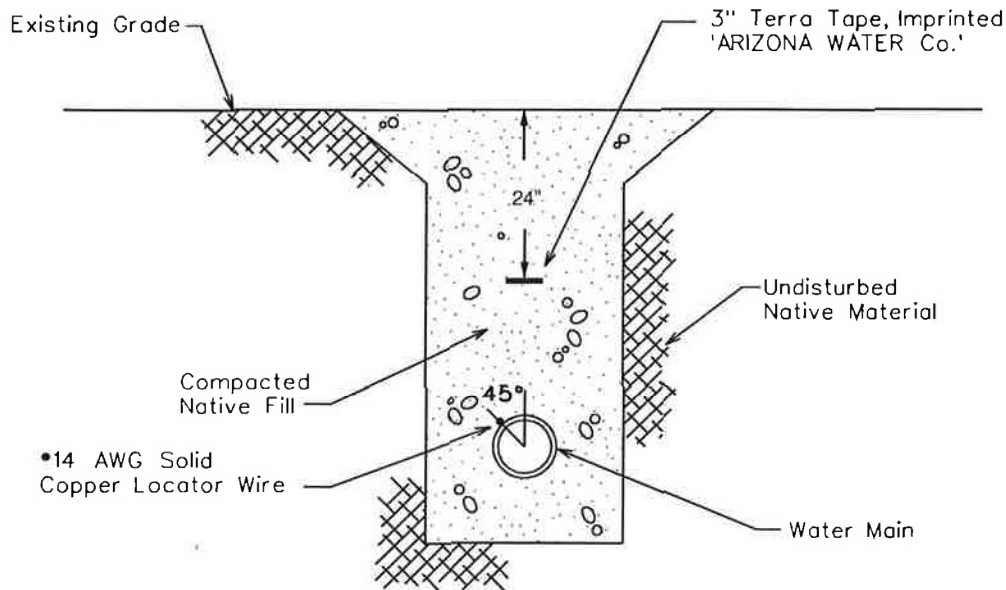


1. Minimum 2 Supports Per Joint Of Pipe.
2. All Bolts Shall Have A Lock Washer Under The Nut.
3. All Nuts Shall Be Stainless Steel Series 304.

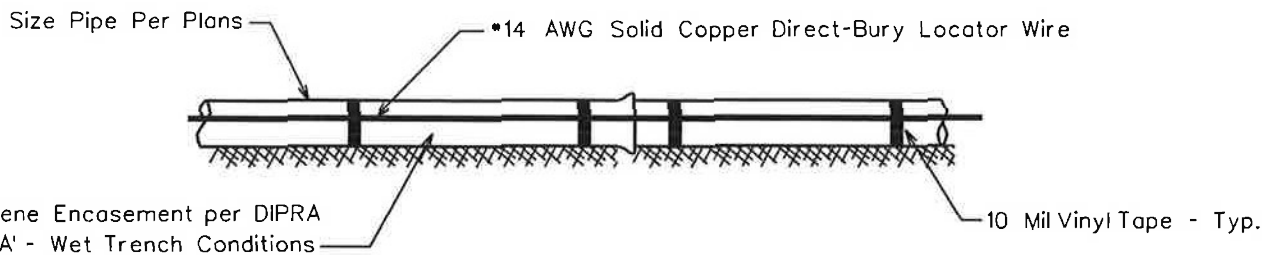
PIPE SIZE	A	B
8"	8"	15"
10"	9"	17"
12"	10"	19"



E-9-27-1



TYPICAL WATER TRENCH DETAIL



TYPICAL PROFILE VIEW

WIRE GENERAL NOTES:

1. All pipe shall have 14 AWG Solid Copper Direct-Bury Locator Wire Installed Directly To The Polywrap At 45° From The Vertical Center Of The Pipe and Shall Be Attached Using 10 Mil Vinyl Tape.
2. The Locating Wire Shall Terminate At the Top Of Each Valve Box and Be Capable of Extending 12" Above the Top Of The Box In Such A Manner So As Not To Interfere With Valve Operation.

TAPE GENERAL NOTES:

1. Use Terra Tape 3" Marking Tape As Manufactured By Reef Industries Inc. Of Houston, Texas (1-800-231-2417)
2. The Tape Is Blue & Imprinted 'ARIZONA WATER Co.'
3. INSTALLATION: The Pipe Warning Tape Shall Be Installed Over All Water Mains And Shall Be Buried 24 Inches Below The Surface Over The Center Of The Pipe.
 - A) The Backfill Shall Be Sufficiently Levelled So That The Tape Is Installed On A Flat Surface.
 - B) The Tape Shall Be Centered In The Trench With The Printed Side Up.
 - C) Care Shall Be Exercised To Avoid Movement Of The Tape While The Remaining Backfill Is Moved Into The Trench.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

PIPE WARNING TAPE AND LOCATOR WIRE

DRAWN BY: CB

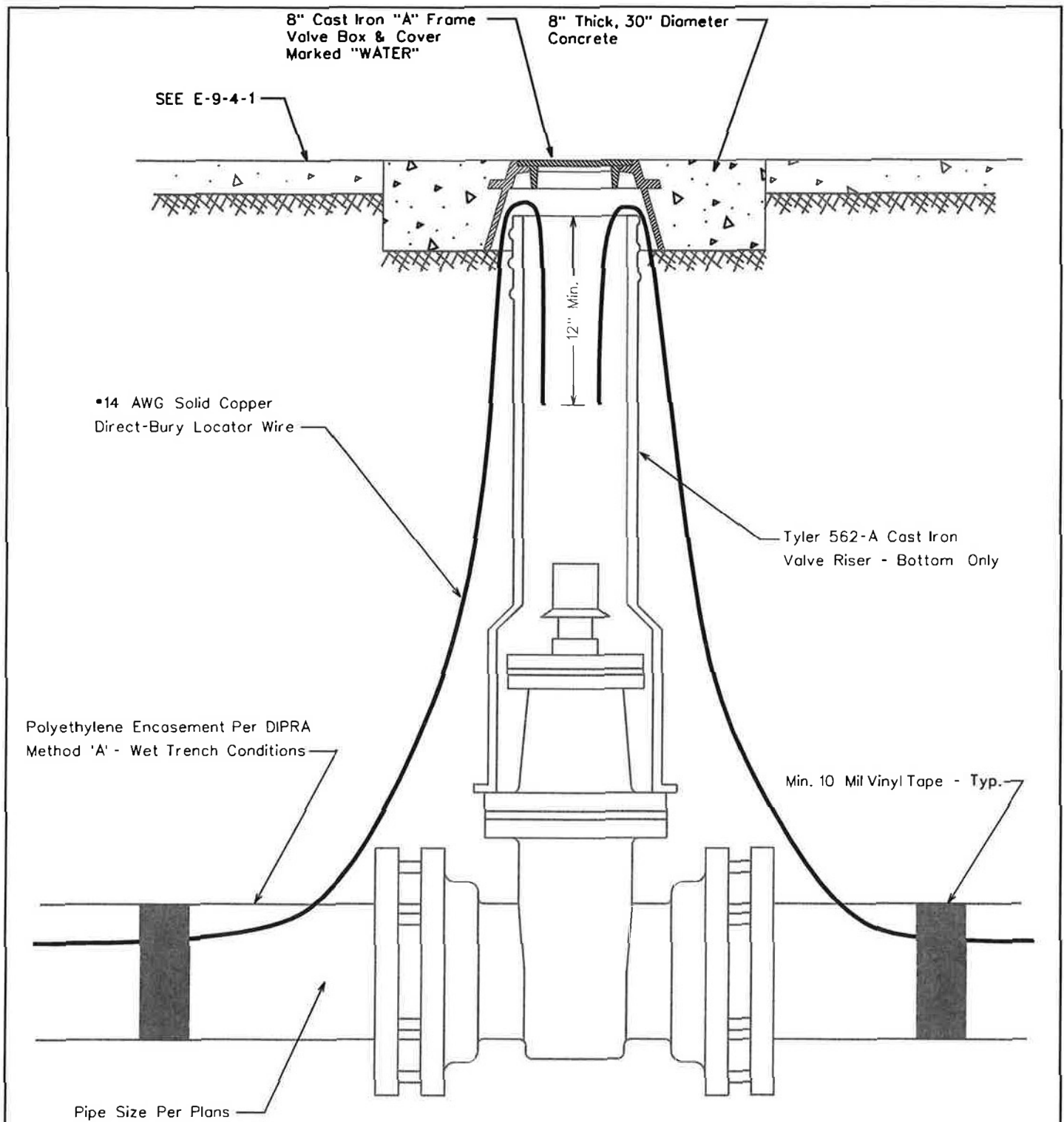
APPROVED BY:

DATE:

03.24.1997

09.27.2006

E-9-28-1



ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

LOCATOR WIRE TERMINATION

DRAWN BY:

CB

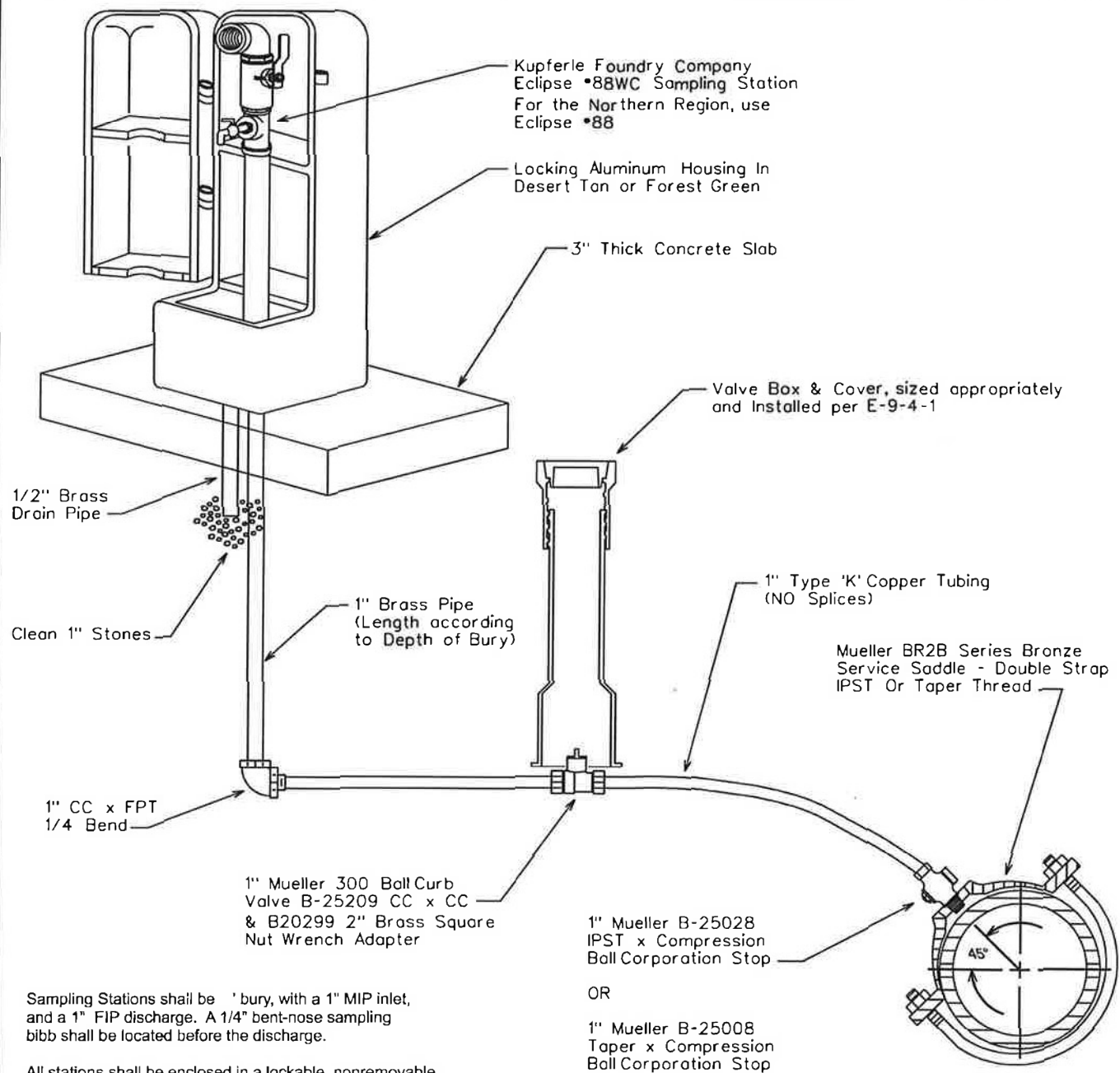
APPROVED BY:

DATE:

09.27.2006



E-9-28-2



Sampling Stations shall be ' bury, with a 1" MIP inlet, and a 1" FIP discharge. A 1/4" bent-nose sampling bibb shall be located before the discharge.

All stations shall be enclosed in a lockable, nonremovable, aluminum-cast housing.

When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

All working parts will be of brass and serviceable from above ground with no digging. (OPTIONAL: if desired, a 1/2" brass drain tube will be provided within the locking cover).

A 1" ball valve will control the water flow, and be located before (or after) the sampling bibb, as manufactured by Kupferle Foundry, St. Louis, MO 63102.

SADDLE TAP TO CA, PVC, OR DI PIPE

NOTE: The minimum distance between taps on mains other than ductile iron is 12"

Pipe Depth Per
E-8-1-2, Item 3.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

SAMPLING STATION

DRAWN BY: CB

APPROVED BY: MW

DATE: 01.24.2007



E-9-29-1

Technical drawing of a manhole structure, showing plan and elevation views with dimensions and labels.

Plan View (Left):

- Overall width: 4' (divided into 2' and 2').
- Overall depth: 4' (divided into 2' and 2').
- Inner square opening: 2' x 2'.
- Labels: "VARIES" (pointing to the outer square), "NO. 3 STIRRUPS 36" O.C." (pointing to the inner square), "(4) NO. 4 BARS" (pointing to the outer square).
- Labels: "HIGHER WATER OR SEWER MAIN" (pointing to the top of the structure), "LOWER WATER OR SEWER MAIN" (pointing to the bottom of the structure).

Elevation View (Right):

- Overall height: 10' MIN. (divided into 10' MIN. and 10' MIN.).
- Labels: "PERPENDICULAR" (pointing to the vertical lines).
- Labels: "STIRRUPS EDGE SPACING 24" (pointing to the top edge), "STIRRUPS SPACING 36" (pointing to the side edge).

Section View (Bottom):

- Overall width: 10' MIN. (divided into 10' MIN. and 10' MIN.).
- Labels: "PERPENDICULAR" (pointing to the vertical lines).
- Labels: "SEPARATION DISTANCE" (pointing to the gap between the two sections).

NOTES:

1. 2,000 PSI CONCRETE
2. SEPARATION DISTANCES AND/OR OTHER EXTRA PROTECTION SHALL BE REQUIRED TO PROTECT WATER MAINS FROM CONTAMINATION BY SANITARY SEWER MAINS. SEE AWC STANDARD SPECIFICATION PAGES E-8-1-9 AND E-8-1-10.
3. SEE CROSS SECTION DETAIL FOR LIMITS OF SEPARATION/EXTRA PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE PIPES.
4. RECLAIMED WATER SHALL BE CONSIDERED A SANITARY SEWER WHEN PLACED NEXT TO A POTABLE WATER MAIN.

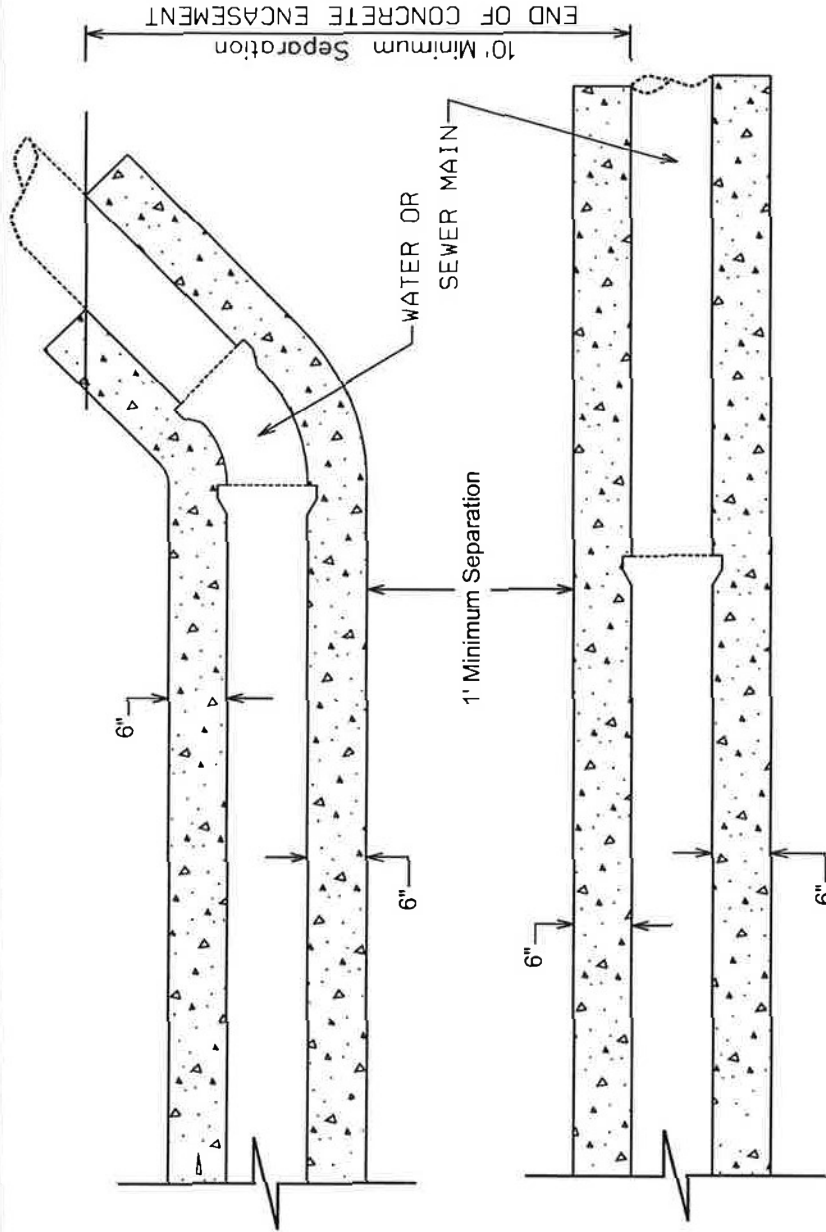
ARIZONA WATER COMPANY

WATER AND SANITARY SEWER SEPARATION/PROTECTION

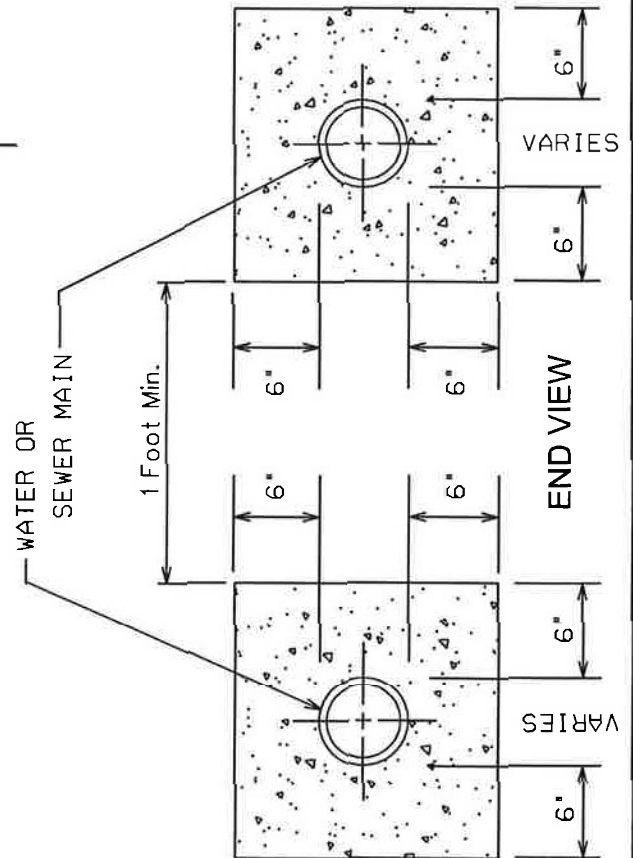
E-9-30-1

NOTES:

1. 2,000 PSI CONCRETE
2. SEPARATION DISTANCES AND/OR OTHER EXTRA PROTECTION SHALL BE REQUIRED TO PROTECT WATER MAINS FROM CONTAMINATION BY SANITARY SEWER MAINS. SEE AWC STANDARD SPECIFICATION PAGES E-8-1-9 AND E-8-1-10.
3. SEE CROSS SECTION DETAIL FOR LIMITS OF SEPARATION/EXTRA PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE PIPES.
4. RECLAIMED WATER SHALL BE CONSIDERED A SANITARY SEWER WHEN PLACED NEXT TO A POTABLE WATER MAIN.



PLAN VIEW



ENCASEMENT FOR PARALLEL PIPES

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

WATER AND SANITARY SEWER
SEPARATION/PROTECTION

DRAWN BY:

CB

APPROVED BY:

JW

DATE

04.07.2008

△

E-9-30-2

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