METRO WATER DISTRICT

SUPPLEMENTAL SPECIFICATIONS AND DETAILS FOR CONSTRUCTION

OCTOBER 2016

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SUPPLEMENTAL SPECIFICATIONS

METROPOLITAN DOMESTIC WATER IMPROVEMENT DISTRICT
SUPPLEMENTAL SPECIFICATIONS AND DETAILS
FOR CONSTRUCTION

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MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0201, MOBILIZATION

0201.010 Description of Work

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

The work shall consist of preparatory work and operations, including but not limited to, the movement of personnel, equipment, supplies, incidentals, etc. to the project site; the installation and removal of project signs; the establishment of all offices, buildings and other facilities necessary for work on the project; for procurement of insurance and bonds for the project; and for all other work and operations that must be performed and costs incurred prior to the beginning of work on the various items on the project site.

0201.0301 General

REMOVE PARAGRAPH SIX AND SEVEN

MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0203, SITE CLEARING

0203.0301 General

MODIFY PARAGRAPH ONE AS FOLLOWS:

All vegetation and objects, public or private, designated to remain shall be preserved from injury or defacement.

MODIFY PARAGRAPH THREE AS FOLLOWS:

Replace “seven (7)” with “two (2)”

MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0205, EARTHWORK

0205.0301 General.

ADD THE FOLLOWING TO PARAGRAPH THREE:

The Contractor shall submit an application for construction water a minimum of two (2) working days prior to use of said water.

0205.0302 Excavation.

(C) Construction Elements.

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(3) Surplus Material.

CHANGE PARAGRAPH ONE AS FOLLOWS:

Unless otherwise indicated on the project plans or specified in the special specifications, surplus excavated material shall be removed from the job site and disposed of by the contractor in a manner approved by the Engineer and in accordance with the requirements of City of Tucson/Pima County Standard Specifications for Public Improvements.

0205.0303 Structure Excavation and Structure Backfill.

(C) Construction Elements.

(2) Backfill

(a) Placement of Backfill:

CHANGE PARAGRAPH TWO AS FOLLOWS:

Backfill material shall not be placed against cast-in-place concrete structures until the concrete has developed its full design strength.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0209, INSTALLATION OF WATERLINES

0209.0302 Material Delivery and Storage.

ADD THE FOLLOWING:

All pipe, fittings and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment, tools and methods used in handling and installing pipe and fittings shall not damage the pipe and fittings. Pipe and fittings in which the lining has been damaged shall be replaced. With written permission from the Engineer, small and readily accessible damaged areas or manufacturing imperfections may be repaired per the manufacturer's recommendations.

All pipe coating and polyethylene wrap, which has been damaged, shall be repaired by the Contractor before the pipe is installed.

0209.0303 Sequence.

MODIFY PARAGRAPH ONE AS FOLLOWS:

Change '24"' to '12"'.

0209.0307 Water Shutoffs.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

The Contractor is required to coordinate all requests for valve closure with the MDWID Inspector. The Contractor shall provide MDWID with a written schedule of all planned interruptions in service a minimum of 5 days prior to the said interruption. The Contractor shall notify all affected water users as determined by MDWID in writing, on MDWID forms, a minimum of 48 hours prior to the planned interruption unless otherwise specified by MDWID. Said notification shall include time of water shutoff, duration of outage, and Contractor's name and phone number that may be accessed 24 hours a day for the purpose of addressing inquiries from affected water users.

In the event of damage to an existing water main, the Contractor shall immediately notify MDWID. MDWID personnel shall operate all valves necessary to effect repairs. Repairs to existing water mains shall be performed by MDWID personnel unless otherwise authorized. When authorized by MDWID, emergency repairs made by the Contractor shall be performed under the supervision of MDWID and shall continue non-stop until water service is restored. If the Contractor is responsible for damage to existing water mains, repairs shall be at the Contractor's sole expense.

0209.0309 Trench Excavation.

(1) Trenches.

ADD THE FOLLOWING TO THE FIRST PARAGRAPH:

Blasting will not be permitted.

ADD A PARAGRAPH AS FOLLOWS:

Restoration of Wash Surfaces: The contractor shall restore all excavations in wash beds (as shown on the drawings or as required by these specifications) to original conditions. The top 18" of the excavation in the wash shall be backfilled with native soil and blended with adjacent soil to eliminate any weak spot for erosion. The wash bed shall be resurfaced to original condition. In addition, all excavations in paved or unpaved drainage ways, as shown on the drawings or required by these specifications, shall be restored to original condition or better.

(3) Surplus Material.

CHANGE PARAGRAPH ONE AS FOLLOWS:

Unless otherwise indicated on the project plans or specified in the special specifications, surplus excavated material shall be removed from the job site and disposed of by the contractor in a manner approved by the Engineer and in accordance with the requirements found in Pima County/City of Tucson Standard Specifications for Public Improvements Section 0107.

Shortages of material caused by the disposal of any material by the contractor before fill quantities are satisfied shall be replace at the contractor's expense.

(c) Obstructions.

REMOVE THIS SECTION:

0209.0310 Bedding Material.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Imported pipe bedding/shading material shall be sourced from washed materials and meet the following sieve analysis and plasticity requirements**:**

Sieve Size	Percent Passing
1 inch	100

#4	60-100
#200	0 - 10

Max. P.I. = 5
Max L.L. = 30

All sieve analysis shall be certified and submitted to the Owner prior to the start of construction.

Bedding/shading material deemed as unsuitable by the project inspector will be tested. Material that fails to meet the above requirements shall be removed and replaced at the contractor's expense. No bedding/shading material shall be placed until replacement material is accepted by the engineer. Contractor shall provide proof of compliance in the form of certification by an independent testing facility at contractor's expense.

(A) Placement of Bedding/Shading Material.

Pipe sizes 12" diameter and smaller shall be installed on a minimum 4-inch thickness of bedding material. Pipe sizes greater than 12" diameter shall be installed on a minimum 6-inch thickness of bedding material.

Bedding/shading material shall be placed under, around, and over the pipe to an elevation of 1-foot above the top of the pipe after compaction. Bedding/shading material shall be place in a manner which will prevent distortion, damage to, or displacement of the pipe from its intended location. Bedding/shading material shall also be placed and water settled so that adequate support will be provided in the haunch areas of the pipe. Bedding thickness shall be measured after installation of pipe.

The bedding/shading material shall be placed in a minimum of three (3) lifts, from the bottom of the trench to 12-inches above the top of the pipe. Each lift shall be compacted to 90% of the dry density, determined in accordance with Arizona Test Methods 225, 226, 230 or 231, and 232. Compaction of the bedding/shading material shall be accomplished in a manner, which will prevent displacement of the pipe and damage to the joint and fittings. Water jetting is <u>not</u> allowed.

(B) Placement of CLSM as bedding material in the pipe zone.

No CLSM material may be used as bedding/shading material unless as specifically called for on the project plans or as approved by the Engineer.

Placement of CLSM as bedding/shading material shall conform to Tucson Water Standard Specification 0209.0310 (B).

0209.0311 Installation.

(A) General.

REMOVE PARAGRAPH FOUR AND FIVE AND REPLACE WITH THE FOLLOWING:

Underground water installations shall have a minimum of 44 inches of cover from final grade except as otherwise noted on the approved construction drawings.

Water mains installed within existing right-of-way shall be installed with a minimum of 60 inches cover from the final grade, or as otherwise noted on the approved construction drawings. All underground water mains shall be located a minimum of 24 inches below any existing or proposed drainage structure, except where Pima County Standard Detail 600 pertains to the proposed work.

ADD THE FOLLOWING AS PARAGRAPH SEVEN:

Design of pipe sizes 12" diameter and larger shall include line and grade profile. Installation of pipe sizes 12" and larger shall be in accordance with line and grade profile as indicated on project plans.

0209.0312 Cutting of Pipe.

REMOVE PARAGRAPH FOUR:

0209.0313 Connections.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Connections or tie-ins between new work and existing piping shall be made using fittings suitable for the conditions encountered. Each connection or tie-in with an existing pipe shall be made at a time and under conditions which will least interfere with service to customers, and as authorized by the Owner. No tie-in between new work and existing piping shall be made before the new work has been disinfected, tested, and accepted by the Owner. Facilities shall be provided by the Contractor for proper dewatering of existing piping prior to making the connection or tie-in and for disposal of all water removed from the dewatered lines without damage to adjacent property or excavations. Special care shall be taken to prevent contamination when dewatering, cutting into and making a connection or tie-in with an existing potable water piping. Trench water, mud or other contaminating substances shall not be permitted to enter the lines. The cost of labor and materials required for connections or tie-ins shall be included in the price bid for installing the water mains.

ADD THE FOLLOWING TO PARAGRAPH TWO:

The Contractor shall bleed off residual pressure in existing waterlines prior to disturbing any restraints. The Contractor shall be responsible for dewatering existing waterlines prior to making connections.

0209.0316 Backfilling.

Materials

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Pima County/City of Tucson Standard Specifications for Public Improvements (2003 Edition or Current Edition), Section 923, Utility Installations within Public right-of-Way except for the following modifications:

923 – 3.07 Trench Backfill

ADD THE FOLLOWING:

The Contractor must provide evidence that the material meets current compaction requirements. Testing must be in accordance with the following schedule or as directed by the jurisdictional authority.

A minimum of one (1) test is required per 500 feet of trenching length or a portion thereof, per every three (3) feet of trench depth or portion thereof. The Engineer, designated representative, or jurisdictional authority may require additional tests anywhere within the backfill prism.

(C) Utility Locations and Separations.

REMOVE THS SECTION AND REPLACE WITH THE FOLLOWING:

Utilities encountered during construction may cross and/or run parallel to proposed water lines. In general, the locations of existing and proposed relocations of major utilities aboveground and underground are indicated on the Plans. This information has been obtained from utility maps, field survey work and from descriptions provided by the various agencies involved, and represents the best information available. Existing and proposed utility locations are shown on the Plans for design purposes only. It is to be understood that other facilities not shown on the Plans may be encountered during the course of the work.

Under State Law (ARS 40-360-21) the Contractor is required to contact all utilities in order to determine the locations of their respective utilities prior to any excavation. The Contractor is responsible for any damages to existing utilities and will make any necessary repairs at his expense. The Contractor shall brace and/or support existing utilities, including traffic signal poles, as necessary to protect the existing facility from disturbance/damage.

The Contractor shall contact Blue Stake two (2) working days prior to any excavation or construction in the vicinity of existing facilities or utility poles. The Contractor shall contact Tucson Electric Power Company at least ten (10) working days prior to excavation within ten (10) feet of any power pole. Tucson Electric Power Company shall provide relocation or bracing of said pole. Any required utility relocation shall be accomplished in cooperation with and to the satisfaction of the company or agency having jurisdiction over the particular utility. The Contractor is responsible for all costs associated with any utility relocation and/or bracing.

The Contractor shall contact the representative of all utility companies to coordinate any of the Contractor's work that may involve a specific utility and the Contractor shall coordinate his operations with the utility to facilitate the satisfactory completion of the work.

(1) Electric.

REMOVE AND REPLACE PARAGRAPH TWO WITH THE FOLLOWING:

The use of joint trenches is not authorized.

(2) Storm Drain Culvert.

MODIFY THIS SECTION AS FOLLOWS:

The minimum vertical separation between the water main and storm drain culverts shall be per Pima County Standard Detail SD-600.

0209.0317 Testing and Chlorination.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

All new waterline installations shall be subject to testing and chlorination in accordance with these specifications. After the installation of all pipe, specified fittings, valves, hydrants, service lines and thrust restraints, the following procedure shall be followed to provide a basis of acceptance of all new work:

1. Preliminary Flushing
2. Disinfection
3. Final Flushing
4. Microbiological Testing
5. Hydrostatic Pressure Test

The above testing and chlorination procedure may be modified as follows if the final connection(s) between the existing and new water system are not yet made and the new water line is capped adjacent to the final connection point:

1. Preliminary Flushing
2. Hydrostatic Pressure Test
3. Disinfection
4. Final Flushing
5. Microbiological Testing
6. New Waterline Pipe Connection to Existing Water System

In the event that the alternative testing and chlorination procedure is followed, all appurtenances required to make the connections(s) to the existing water system shall be swabbed or sprayed internally with a 1 percent calcium hypochlorite and water mixture. The new water line pipe connection(s) to the existing water system shall remain exposed until inspected for leaks.

An explanation of each procedure step follows:

(1) Preliminary Flushing. The new water line shall be slowly filled with potable water and all air shall be vented from the pipeline. The water line, hydrants and appurtenances shall be flushed at a minimum mean main velocity of at least 2.5 fps for a period of 60 seconds per 100 foot length of the section of the work being flushed. In areas where the existing system will not produce the required mean velocity, the minimum mean velocity shall be achieved for a commensurately longer duration as directed by the Engineer. All flushing water shall be disposed of in a manner that meets all local, state and federal requirements.

(2) Disinfection. Disinfection shall be performed in accordance with the provisions of the latest revisions of the Arizona Department of Health Services Engineering Bulletin No. 8, except as modified herein.

(A) Concentrated chlorine solution shall not enter any part of the existing system. All new work, including mains, hydrants and appurtenances shall be disinfected.

(B) The preferred point of application of the concentrated chlorine solution is at a newly installed fitting closest to the fill source or through a corporation stop installed near the fill source specifically for the disinfection purposes. If no existing fitting is present at this location, the Contractor may install a temporary fitting at its own cost, or find another fill source alternative.

(C) The method of chlorination shall be the general continuous feed method. The tablet method of chlorination shall not be accepted. The chlorine concentration shall be maintained at a minimum of 50 mg/l (50 ppm) of available chlorine in all portions of the new work being disinfected during the application period.

(D) The retention period shall be 24 hours. At the end of this 24 hour period, the disinfection solution shall contain not less than 10 mg/l (10 ppm) of available chlorine in all portions of the new work being disinfected.

(3) Final Flushing. At the end of the retention period, as approved by the Engineer, the heavily chlorinated disinfection solution shall be flushed from all parts of the new work. All flushing water shall be disposed of in a manner that meets all local, state, and federal requirements.

(A) Final flushing shall be performed in accordance with the Procedures described in Item (1) Preliminary Flushing, above, except that all main line valves shall be operated throughout their range and be shown to be tight closing during the final flushing.

(B) Final flushing shall continue until chlorine concentration of the flushing water being discharged from all points in the new work is equivalent to the chlorine level of flushing water supply or is less than 1 mg/l (1 ppm).

(C) Service lines shall be thoroughly flushed prior to meter installation.

All flushing shall be disposed of in a manner that meets all local, state and federal requirements.

(4) Microbiological Testing. After final flushing and before the new work is accepted, microbiological test(s) shall be obtained by MDWID and shall show the absence of coliform organisms (no coliform organisms shall be detected in any samples).

Microbiological testing of production facilities as well as pipelines shall be required.

Failure of initial microbiological test(s) will require repeated chlorination, flushing and microbiological testing at the Contractor's sole expense.

(5) Hydrostatic Pressure Testing. Testing shall be performed in accordance with Tucson Water Standard Specification No. 1431, except as modified by the MDWID Modification to the Tucson Water Standard Specification No. 1431, Hydrostatic Pressure Testing of Water Facilities.

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The Contractor shall provide all vents, piping, plugs, bulkheads, valves, bracing, blocking, pump and all other equipment for making the tests. Hydrostatic pressure testing shall not be conducted against existing valves unless authorized by the Engineer. MDWID pressure gages shall be used to conduct the test. The test will be conducted after backfilling, unless the Contractor can provide acceptable means (in addition to restraint requirements specified in the plans) to ensure the integrity of the pipe during the test.

Failure of the hydrostatic pressure test(s) may require repeated chlorination, flushing and microbiological testing at the Contractor's sole expense.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0210, PIPE MARKING, DETECTION TAPE AND TRACER WIRE

0210.0301 General

REMOVE THE ENTIRE SECTION (A):

(B) Potable Water Detectable Pipe Locating Tape

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Following installation of pipe bedding and backfill to 24-inches above the top of pipe in accordance with MDWID specifications, the Contractor is required to install polyethylene potable water detectable pipe locating tape. The backfill shall be sufficiently leveled to provide a flat surface for installation of the tape. The tape shall be centered in the trench and laid flat with printed side up in accordance with MDWID Standard Detail MW-115, page 2 of 2. Caution shall be exercised during completion of backfill to avoid displacement of or damage to warning tape.

CHANGE SECTION (C), RECLAIMED WATER DETECTABLE PIPE LOCATING TAPE, PARAGRAPH 2 AS FOLLOWS:

"CAUTION NON-POTABLE WATERLINE: CONTACT METRO WATER"

(B) Tracer Wire

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Tracer wire shall be installed in accordance with Tucson Water SD-116 and MDWID SD-115.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0211, PAVEMENT REPLACEMENT

0211.0201 Materials.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

All construction regarding pavement replacement shall conform to the Pima County and City of Tucson Standard Specifications for Public Improvements. The following materials and specifications shall apply:

Category	Standard Section	Remarks
Asphaltic Concrete	406	Mix No. 2 or 3
Asphaltic Concrete Overlay	406	Mix No. 3
Aggregate Base Course	303	100% Density
Grading	205	95% Subgrade compaction
Tack Coat	404	
Chip Seal Coat	404	Single Application (full widths)
Slurry Seal Coat	404	Single Application (full widths)

0211.0302 Removal of Asphaltic or Concrete Pavement.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Pavement removal for the pipelines shall include all asphaltic or concrete pavement, plus sub-base material in accordance with Pima County Standard Detail 216 or as noted on the Plans. Existing pavement shall be power saw cut (wheel cut not permitted) to provide a clean edge for new pavement.

Damaged pavement outside pavement width limits shall be saw cut in perpendicular cuts and shall also be removed and replaced by the Contractor at his expense. Pavement removal for transverse crossing will include all asphaltic or concrete pavement, plus sub-base material. Where temporary patching is required, pavement removal to the full-specified width shall be deferred until the temporary patch is removed.

0211.0303 Temporary Paving Patch.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Temporary cold mix patch is required on all pavement cuts where vehicular traffic is to be returned and shall be applied immediately after backfill. The patch is to be a minimum one inch (1") in thickness and placed over seven inches (7”) of ABC and leveled with the existing paved surface.

The patch is to be maintained daily throughout the life of the contract or until replaced by the permanent pavement patch, including patches in areas disturbed from compaction testing. Adequate material quantities of ABC and cold patch mix to make

temporary cold patch must be on the job site before cutting pavement.

0211.0304 Temporary Paving Patch Removal.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

The temporary-paving patch shall be removed from the trench and the trench excavated to provide for the permanent pavement replacement.

Any over-excavation shall be brought to grade with aggregate base course. If it has not already been accomplished in the backfill, the subgrade is then to be wetted to optimum moisture content and compacted to 100% of standard density as determined by test designation, Arizona Test Method 225, 226, 230 or 231, and 232.

The existing paving edge shall receive a tack coat of liquid asphalt before the new pavement is laid in contact with it in accordance with Pima County/City of Tucson Standard Specifications for Public Improvements, Section 404.

0211.0305 Replacement of Asphaltic Pavement.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

(a) Pima County Right-of-Way.

The Contractor shall conform to the Pima County/City of Tucson Joint Specifications and Details – Standard Detail 216 for requirements that apply to the patching of utility trenches.

0211.0400 MEASUREMENT AND PAYMENT

REMOVE THIS SECTION

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0212, EXISTING VEGETATION & NATIVE PLANTS

0212.0201 Materials.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

The Contractor shall insure that all relocated or transplanted native plants are in a sound, healthy condition free from insect infestations, bark abrasions, weak branches, or other objectionable disfigurements, and shall immediately replace any plants which are unacceptable. All native plants are to be warranted for a maintenance period of two (2) years from final acceptance of the project. During the maintenance period, all native plants are to be guaranteed to remain in a healthy, vigorous state of growth. At anytime up to and including the end of the maintenance period, native plants found to be unacceptable to the Engineer will be replaced, and replacement native plants will be guaranteed for an additional one (1) year(s).

0212.001 General.

REMOVE PARAGRAPH THREE AND REPLACE WITH THE FOLLOWING:

Prior to bidding on a project, the Contractor shall obtain a copy of the Arizona Native Plant Law, Chapter 7 from the Arizona Department of Agriculture, 400 W. Congress St., Tucson, phone 520-628-6310. The Contractor shall then familiarize himself with all native plant on the job site.

REMOVE PARAGRAPH FOUR AND REPLACE WITH THE FOLLOWING:

The Contractor shall obtain and comply with the proper permits from the Arizona Commission of Agriculture prior to the removal or relocation of any protected plants as defined in the Arizona Native Plant Law, Arizona Revised Statutes, Chapter 7. Adjustments in the pipeline alignment to avoid obstructions shall require the approval from the MDWID District Engineer.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0213, SURFACE RESTORATION

0213.0302 Warranty.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

All replacement plantings shall be warranted by the contractor for a period of two (2) years from the final acceptance of the project. Establishment of plantings materials shall conform to the provisions of Section 807 of PC/COT Standard Specifications for Public Improvements (latest edition). At anytime up to and including the end of the maintenance period, native plants found to be unacceptable to the Engineer will be replaced, and replacement native plants will be guaranteed for an additional one (1) year(s).

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0215, CONSTRUCTION SURVEYING AND LAYOUT

0215.0301 Construction Requirements.

REMOVE THE SAMPLE FORM AND REPLACE WITH MDWID STANDARD DETAIL MW-105, PAGE 7, 8 & 9.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0216, CONSTRUCTION SURVEYING AND LAYOUT (PERFORMED BY CITY)

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1201, VERTICAL TURBINE BOOSTER PUMPS

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1202, VERTICAL TURBINE LINESHAFT WELL PUMP & MOTOR (OIL LUBRICATED)

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1203, CENTRIFUGAL BOOSTER PUMP & MOTOR

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1204, SUBMERSIBLE PUMPS

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1402, CONCRETE CYLINDER PIPE

1402.0201 Materials.

(A) Concrete Cylinder Pipe.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Rubber gaskets shall comply with the requirements of Sections 2.8 and 3.4 of AWWA C303.

(B) Pressure Requirements.

REMOVE PARAGRAPH TWO AND REPLACE WITH THE FOLLOWING:

The design pressure for the concrete cylinder pipe and appurtenances shall be as shown on the approved plans. Hydrostatic pressure testing shall be in accordance with Section 1431, except the test pressure shall equal the design pressure at the lowest point in the section being tested. All pipe and fittings shall be designed to withstand a full vacuum. The Contractor shall pressure test all new work.

(C) External Load Considerations.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Pipe deflection under the external load shall not exceed $D_2/4000$, where D is the nominal pipe diameter. External loads shall be calculated using a transition width trench plus H-20 traffic loading. The unit weight of the backfill material shall be 120 pounds per cubic foot and the Kμ' soil factor shall be 0.150. The ring deflection shall be calculated from "Spangler's Formula" using a deflection lag factor D_1 of 1.25, a bedding constant K of 0.100, a soil modulus E' of 400 psi, and a settlement projection ratio of 0.3.

ADD THE FOLLOWING AS ITEM (E):

(E) Fittings.

Steel casings for fittings shall conform to the Specifications for Mild-to-Medium-Strength Carbon-Steel Castings for General Application, Grade 70-36, Normalized" (ASTM Designation A27) and AWWA C208.

Dimensions for fabricated steel water pipe fittings shall comply with the requirements of AWWA C208.

SECTION 1402

1402.0301 General.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Flanges shall be AWWA Standard Steel Ring Flanges rated at a pressure class equal to or greater than the pressure class of the pipe and shall conform to AWWA C207. It shall be the Contractor's responsibility to be certain that all flanges used in the pipeline are compatible with flanges used in the valves, particularly relevant to bolt patterns, diameters, drilling patterns, and proper lengths. Bolts and nuts shall be ASTM 325 hex head. Provide special thickness steel cylinder section (12" and 48" long), either side of flanges where bolted to valves.

1402.0302 Installation.

ADD THE FOLLOWING AS ITEM (F):

(F) Joints.

Inside Joint Recess – 24" Diameter and Larger
After the pipe bedding and backfill have been compacted, the inside joint recess of the pipe shall first be moistened, then filled and pointed with a stiff cement mortar, consisting of 1 part cement to 1 ½ parts of sand. The finished joint shall be smooth and flush with the adjacent pipe surfaces. Interior joint pointing operations shall not be conducted within two joints of pipe laying operations.

Exterior Joint Recess
After joining pipe, a plastic or cloth band at least eight inches (8") in width shall be centered and secured over the exterior joint recess. The band shall be bound to the pipe by the use of steel box strapping or by an equivalent method and shall completely and snugly encase the outside joint except for an opening near the top, where mortar grout is to be poured in to the joint recess per AWWA M9. After the band is properly secured, the joint recess shall be moistened with water and then filled with mortar consisting of one part Portland cement and two parts of sand mixed with water to the consistency of thick cream. The mortar grout shall completely fill the outside annular space between the ends of the pipe and around the complete circumference. After the recess has been filled, the opening shall be closed and the mortar allowed to set before bedding and backfill is placed above the bottom of the pipe per AWWA M9.

ADD THE FOLLOWING AS ITEM (G):

(G) Polyethylene Encasement.

All concrete cylinder pipe, including valves and fittings, shall be encased in

polyethylene in accordance with ANSI A21.5 (AWWA C-105, Polyethylene Encasement for Ductile Iron Pipe Systems).

ADD THE FOLLOWING AS ITEM (H):

(H) Inspection.

After the interior joint space of the concrete cylinder pipe (CCP) has been pointed with cement mortar, the interior of the pipeline shall be carefully inspected by closed circuit television (CCTV) and videotaped to determine the condition of the pointed joint and any other potential flaw in the interior of the pipe. The CCTV videotaping shall be reviewed by experienced personnel trained in the workmanship of the completed mortared joint. A submittal verifying the experience level of the camera operator and crew shall be provided to MDWID. Any condition that requires repair shall re-televised and videotaped to document its final condition following any necessary repair. The distance of the camera from a known point shall be continuously displayed on the video. A color videotape and suitable CCTV log shall be submitted to MDWID following final inspection.

The inspection camera shall be specifically designed to provide a close-up view of the pipe walls through the planning and rotation of the camera head from a remote control console. The camera unit shall provide a color picture and shall be capable of operation through a minimum of 1200 lineal feet of pipeline. A transportation skid assembly and adequate lighting shall be utilized to provide the best viewing possible. A television-viewing monitor shall be available on site to allow MDWID personnel to view the interior of the pipe during the television inspection.

Prior to its use, the inspection camera and auxiliary equipment shall be thoroughly sanitized, and written documentation submitted detailing procedures followed.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1403, HIGH DENSITY POLYETHYLENE (HDPE) PIPE

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1404, POLYVINYL CHLORIDE PIPE

1404.0201 Materials.

(B) Pressure Class.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Unless otherwise specified on the plans or in the special specifications, PVC pipe shall be pressure class 200, dimension ratio 14 (DR 14) (cast iron O.D.). MDWID authorization is required for use of 12" or larger PVC pipe.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1405, GALVANIZED STEEL PIPE

1405.0301 General.

ADD THE FOLLOWING BEFORE PARAGRAPH ONE:

Galvanized steel pipe shall not be used where the pipe will be subject to continuous contact with water.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1406, THRUST RESTRAINT

1406.0101 Description of Work.

DELETE THE STANDARD DETAIL REFERENCE AND ADD THE FOLLOWING:

(MDWID Supplemental Detail MW 600, MW 610)

1406.0201 Materials

(A) Ductile Iron Pipe.

MODIFY THE 1ST SENTENCE OF PARAGRAPH ONE AS FOLLOWS:

When mechanically restrained joints are required for ductile iron pipe, they shall comply with the MDWID Approved Materials List.

(C) Polyvinyl Chloried Pipe (PVC)

REMOVE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Restraint harnesses shall consist of: a split ring that fits behind the bell; either a split or full restraint ring that installs on the spigot end; and tie bars or tee bolts which connect the two rings. The harness restraint may be split to enable installation after the pipe spigot has been installed into the bell. All components which comprise the restraint harness shall be manufactured of ductile iron conforming to the requirements of ASTM A536. Each ring shall have serrations on its full inside diameter (360°).

ADD THE FOLLOWING AS A THIRD AND FOURTH PARAGRAPH:

Mechanical joint retainer gland restraints for polyvinyl chloride pipe shall be designed to fit standard mechanical joint bells with standard “tee” head bolts conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53. Glands shall be manufactured of ductile iron conforming to ASTM A36 grade 60-42-10. Mechanical joint restraint devices shall have a working pressure of at least 305 PSI with a minimum safety factor of 2:1.

Glands shall be provided with a restraining mechanism consisting of a sufficient number of individually set gripping surfaces whose total combined length shall encompass near 360° circumferential coverage. Gripping surfaces shall impart a wedging action against the pipe, increasing in resistance with increasing pressure. The gripping surfaces shall incorporate twist-off nuts to

insure proper setting. Restraint mechanisms shall be installed in accordance with the manufacturer's recommendations.

(D) High Density Polyethylene Pipe (HDPE).

REMOVE THIS ENTIRE SECTION.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1409, TAPPING SLEEVE AND VALVE

1409.0103 Submittals.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Tapping sleeves and valves and the materials used in their manufacture shall comply with the Standard in Appendix B and appear on the MDWID Approved Materials List.

1409.0201 Materials.

(B) Tapping Sleeves and Valves.

REMOVE PARAGRAPHS THREE AND FOUR AND REPLACE WITH THE FOLLOWING:

Tapping sleeves shall consist of minimum type 304 stainless steel body, flange, and all accessories. Nuts or bolts shall be factory coated with an anti-seize material.

Tapping sleeves shall be equipped with ¾" NPT, type 304 stainless steel test plug with standard square head.

1409.0301 Installation.

(A) General.

REMOVE SECTION (A) AND REPLACE WITH THE FOLLOWING:

Tapping sleeves and valves shall be installed in accordance with Section 209 and the manufacturer's recommendations. Tapping sleeves and valves shall be encased with 8 mil polyethylene in accordance with AWWA C105, Method C.

Prior to tapping the water line and in the presence of the MDWID Inspector, tapping sleeves shall be pressure tested at up to 1.25 times the average system working pressure or in accordance with the manufacturers recommendations.

(C) Valves.

REMOVE SECTION (C) AND REPLACE WITH THE FOLLOWING:

Prior to installation, all valves shall be fully opened and closed to check the operation and ensure that the valve fully seats. A record shall be made of the number of turns required to fully open or close the valve. This record shall be submitted to the MDWID Inspector and included on the as-built plans. The inside of the valve shall be thoroughly cleaned prior to valve installation.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1410, RESILIENT-SEATED GATE VALVE

1410.0201 Materials.

(A) Standard.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Resilient-seated gate valves and the materials used in their manufacture shall comply with the Standard in Appendix B and appear on the MDWID Approved Materials List.

(C) Component Parts.

CHANGE ITEM NUMBER (6) AS FOLLOWS:

(6) All exterior ferrous surfaces except fasteners shall be factory coated with a fusion bonded epoxy in accordance with AWWA C550 and shall be suitable for contact with potable water. Nuts and bolts shall be ASTM type 304 stainless steel. Nuts or bolts shall be factory coated with anti-seize material.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1411, BUTTERFLY VALVE

1411.0103 Contractor Submittals.

ADD THE FOLLOWING TO THE END OF THE 2ND SENTANCE IN ITEM FOUR:

...adequate to train service personnel in repair prior to filling orders.

ADD THE FOLLOWING AS SECTION NINE:

An "Affidavit of Compliance" is required from the manufacturer stating that the valves furnished comply with these specifications.

1411.0201 Materials.

(A) Standards.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Butterfly valves and the materials used in their manufacture shall comply with the Standards in Appendix B and appear on the MDWID Approved Materials List.

1411.0301 General.

ADD THE FOLLOWING TO PART A:

Nuts or bolts shall be factory coated with anti-seize material.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1413, AIR RELEASE VALVES

1413.0103 Submittals.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Combination air and vacuum valves and the materials used in their manufacture shall comply with the standards in Appendix B, and appear on the MDWID Approved Materials List.

1413.0201 Materials.

(B) Pressure Class.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Air and vacuum relief valves (ARV) shall be of the size indicated in the drawing and suitable for up to 150 psi working pressure and 250 psi rated pressure.

(C) Component Parts.

(1) General.

CHANGE PARAGRAPH THREE AS FOLLOWS:

The valve trim and all working parts shall be constructed of stainless steel, brass, or other non-plastic, corrosion-resistant material. The float shall be constructed of stainless steel. The drain plug shall be removed and replaced with a brass petcock.

1413.0302 Installation.

ADD THE FOLLOWING AS SECTION (D)

(D) Interior Metal Surfaces. All interior surfaces that are not composed of corrosion-resistant materials, machined parts, or bearing surfaces shall be epoxy coated in accordance with ANSI/AWWA C550. The dry film thickness of the epoxy coating shall be a minimum of 10 mils.

ADD THE FOLLOWING AS SECTION (E)

(E) Paints. Interior and exterior paints shall be suitable for potable water.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1414, PRESSURE REGULATING VALVE

1414.0103 Submittals.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

In order to be accepted for incorporation into the work, the manufacturers make and model of Copper Service Materials shall appear on the MDWID Approved Materials List.

1414.0201 Materials.

(B) Component Parts.

(1) General.

CHANGE PARAGRAPH TWO AS FOLLOWS:

The main valve trim shall be type 304 or 316 stainless steel in accordance with ASTM A167, ASTM A240, or ASTM A276. The pilot control tubes and fittings shall be stainless steel.

1414.0302 Installation.

(B) Pressure Regulating Valves.

REMOVE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Pressure regulating valves shall be installed below grade or as otherwise shown on the approved plans or as directed by the District Engineer.

(C) Installation.

REMOVE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Pressure regulating valves shall be furnished with two (2) pressure gauges with brass ball valves, installed on the inlet and outlet tapping plugs on the side opposite the pilot control system. Pressure gauges shall be provided with a pressure range as shown on the approved plans or as directed by the District Engineer.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATIONS NO. 1416, COPPER SERVICE MATERIALS

1416.0201 Materials.

REMOVE ITEMS (A) AND REPLACE WITH THE FOLLOWING:

(A) This technical provision covers 1" to 2" fittings and pipe for working pressures of 300 pounds per square inch.

REMOVE ITEM (B) AND REPLACE WITH THE FOLLOWING:

(B) All service lines shall be copper. Fittings and connections directly to copper pipe shall be bronze ASTM B62 85-5-5-5 copper tube size (CTS). Flared fittings are prohibited.

REMOVE THE FIRST PARAGRAPH OF ITEM (D) AND REPLACE WITH THE FOLLOWING:

(D) Corporation stops, size 1" to 2" inclusive, shall be ball valve, full opening with o-ring seal and bronze or stainless steel ball. Corporation stops shall be AWWA taper threads (Mueller "CC") inlet x CTS outlet. AWWA taper (Mueller "CC") threads are described in AWWA Specification C800 (latest edition).

REMOVE ITEM (E) AND REPLACE WITH THE FOLLOWING:

(E) Splice unions shall be three-part design for use with type "K" copper service piping, size 1" to 2" inclusive. One three-piece splice union may be used for each hundred-foot roll of 1" copper tubing or each 40 foot roll of 1-1/2" and 2" copper tubing. A splice may be used only when necessary in extending existing copper services to a new required length or for repair sections.

REMOVE ITEM (F) AND REPLACE WITH THE FOLLOWING:

(F) Adaptor couplings shall be male iron pipe (MIP) x CTS, or female iron pipe (FIP) x CTS. All fittings used in the installation of services shall be bronze and shall comply with AWWA Specification C800.

REMOVE ITEM (G) AND REPLACE WITH THE FOLLOWING:

(G) Angle Meter Stops

(1) <u>Sizes ¾" and 1"</u>

Angle meter stops (AMS) shall be all bronze ball style AMS with CTS or iron pipe (IP) inlet. All AMS shall be full ported and shall have locking wings.

(2) Sizes 1-1/2" and 2"

Angle meter stops (AMS) shall be all bronze ball style AMS with oval type water meter flange outlet and CTS inlet. All AMS shall be full ported and shall have locking wings.

REMOVE ITEM (H) AND REPLACE WITH THE FOLLOWING:

(H) Service clamps with bails and rubber or neoprene gaskets shall be either single or double strap, with CC thread, of corrosion resistant materials, described as follows:

1. Saddles

Acceptable materials for use in clamp saddles are (a) All bronze saddle with silicone bronze double straps, or (b) Ductile Iron, meeting ASTM Spec. No. A-536 factory coated externally with not less than 8 mils of fusion-bonded epoxy (holiday tested) with stainless steel straps and nuts. Nuts or bolts shall be factory coated with an anti-seize material. Ductile iron saddles may be single strap for 1" taps and double straps for 1-1/2" and 2" taps.

2. Straps

Bronze double straps shall be used with bronze saddle. Minimum type 304 stainless steel straps and nuts shall be used with Ductile Iron saddle. Each strap shall be designed to include a flattened surface suitable for tightening against the circular pipe exterior with evenly distributed bearing area. Stainless steel nuts or bolts shall be factory coated with an anti-seize material.

Stainless steel single strap may be used for 1" installations provided that the gasket to be furnished shall provide a tapered o-ring or ribbed seal to surround the tap and compresses uniformly when the strap nuts are tightened, avoiding eccentric loading problems.

Double strap clamps shall be used for all 1-1/2" and 2" installations. The gasket provided shall surround the tap and seal by tapered gasket, o-ring, or ribbed gasket. Compression shall be uniform as the strap nuts are tightened, avoiding eccentric loading.

ADD THE FOLLOWING AS ITEM LETTER (I):

(I) Taps to be performed by the Metropolitan Domestic Water Improvement District are to be paid by the customer/applicant at established fees or project cost estimate prior to commencing construction.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1425, VALVE NUT EXTENSION

1425.0104 Delivery, Storage and Handling.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Valve nut extensions shall be provided by the Contractor. Valve nut extensions shall be delivered to the site, stored, and handled so as to avoid damage or deformation.

1425.0301 Installation.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

(A) Valve Extension stems. Valve extension stems shall be installed in accordance with Tucson Water Standard Detail No. 305, except modified by MDWID Standard Detail MW-305. Valve nut extensions shall not be permanently attached to the valve nut.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1426, VALVE BOX AND COVER

1426.0103 Submittals.

REMOVE AND REPLACE WITH THE FOLLOWING:

Valve Boxes shall appear on the MDWID Approved Materials List.

1426.0201 Materials.

(A) Valve Boxes and Covers

REMOVE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Valve boxes shall be one piece with inside fitting cover. Valve boxes and covers shall be heavy cast iron in conformance with ASTM A48, Class 30 B. Covers shall be marked "METRO WATER VALVE". Valve boxes shall be equipped with lugs or lips for setting in concrete. Valve boxes and covers shall conform to the requirements of Standard Detail No. MW-300.

1426.0302 Existing Valve Box and Cover Adjustments

REMOVE THIS ENTIRE SECTION:

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1430, FIRE HYDRANTS

1430.0201 Materials.

CHANGE ITEM (C), COMPONENT PARTS, PARAGRAPH 5 AS FOLLOWS:

The inlet connection shall be a mechanically restrained joint unless otherwise specified. The main valve opening shall be a minimum 5-1/4 inches (5-1/4”). Each hydrant shall include a ‘Custodian’ locking mechanism as manufactured by Hydra Shield. The Contractor shall provide locks to the Project Inspector for installation by MDWID personnel.

1430.0300 Installation.

CHANGE SECTION (C) AS FOLLOWS:

The minimum distance from the centerline of the lowest nozzle and the finished grade shall be eighteen inches (18”). After installation, the Contractor shall paint the hydrant with one coat of primer and two coats of reflective safety yellow enamel. Primer coat shall be as per requirements of final coat product, aluminum / silver in color.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1431, HYDROSTATIC PRESSURE TESTING OF WATER FACILITIES

1431.0301 General.

ADD THE FOLLOWING TO PARAGRAPH FOUR:

Where thrust blocks are authorized due to modifications to existing water lines, a minimum of 24 hours must elapse and concrete must attain a minimum compressive strength of 2500 psi prior to hydrostatic pressure testing. Contractor shall provide proof of concrete mix design to District Engineer prior to construction. The Contractor may use a 'High Early' concrete mix design that achieves a compressive strength of 2500 psi in a submitted specified time. The Contractor may hydrostatic pressure test against a thrust block when the MDWID District Engineer is satisfied that minimum strength has been achieved.

ADD THE FOLLOWING TO PARAGRAPH FIVE:

Only valves restrained according to MDWID Standard Detail MW-600, Table 1, page 6 may be used for hydrostatic pressure testing. Valves restrained only for isolation during normal operating conditions according to MDWID Standard Detail MW-600, Table 2, page 6 shall not be closed during hydrostatic pressure testing.

ADD THE FOLLOWING TO PARAGRAPH SEVEN:

After all entrapped air has been expelled and prior to the start of hydrostatic pressure testing, air release ports shall be closed. Upon satisfactory completion of hydrostatic pressure testing, air release components shall be removed and the hole plugged as directed by the District Engineer.

1431.0302 Hydrostatic Testing.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Hydrostatic testing shall be conducted only after all new work has been installed. Hydrostatic testing shall be conducted only in the presence of the MDWID Inspector. The minimum hydrostatic pressure test for each type of class of pipe shall not be lower than 200 psi at the highest elevation along the test section and shall be maintained for a period of two hours. The test pressure shall not vary by more than ±5 psi during the duration of the test.

Test sections shall be adjusted to maintain a maximum elevation change of twenty-five (25) psi between the highest and lowest elevation along the test section. If valves are not shown on the design plans at appropriate locations, the Contractor shall install additional valves as may be necessary or as directed by the District Engineer. These components shall be considered incidental to the cost of the pipe and testing of the waterline. The location of permanent additional valves shall be shown on the shop drawings and included on the "As-Built" plans.

Acceptance shall be based on successful completion of the hydrostatic pressure test. Should any test of installed pipe or valves disclose a loss of pressure in excess of acceptable limits, the Contractor shall, at no additional cost to MDWID, locate and make repairs as approved by the District Engineer and inspected by MDWID.

Re-testing of segments shall be with the identical test boundaries used for the initial test. The cost of re-testing shall be at the Contractor's sole expense.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1433, RECLAIMED WATERLINES

1433.0301 General.

(A) Utility Separation.

REMOVE THIS SECTION AND ADD THE FOLLOWING:

Reclaimed waterlines will be treated as sewer when crossing or running adjacent to potable waterlines.

Reclaimed waterlines will be treated as potable when crossing or running adjacent to sewer lines. (SD 106).

(E) High Density Polyethylene Pipe.

REMOVE THIS SECTION:

(H) Installation of Water Meters, Meter Boxes, and Service Lines.

REMOVE PARAGRAPH ONE (1) AND REPLACE WITH THE FOLLOWING:

Water Meter for use of Reclaimed Waterlines will be installed by Metro Water District staff only or as directed by the District Engineer.

MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1440, FITTINGS, FLEXIBLE COUPLINGS, AND REPAIR CLAMPS

1440.0201 Materials.

(A) Fittings.

ADD THE FOLLOWING BEFORE PARAGRAPH ONE OF ITEM NUMBER (1):

When available, fittings shall be ductile iron.

REMOVE PARAGRAPH THREE OF ITEM NUMBER (1) AND REPLACE WITH THE FOLLOWING:

All plugs, caps, and blind flanges used for stub-outs shall be tapped for a 2-inch national pipe thread (NPT) and shall meet the requirements of the applicable AWWA Specifications.

ADD THE FOLLOWING BEFORE PARAGRAPH ONE OF ITEM NUMBER (2):

The use of fabricated steel fittings shall only be authorized where shown in the plans or special specifications.

ADD THE FOLLOWING BEFORE PARAGRAPH ONE OF ITEM NUMBER (3):

The use of polyvinyl chloride (PVC) pressure fittings shall only be authorized where shown in the plans or special specifications.

REMOVE PARAGRAPH THREE OF ITEM NUMBER (3)

(B) Flexible Couplings.

REMOVE PARAGRAPH THREE AND REPLACE WITH THE FOLLOWING:

Nuts and bolts for couplings 2 inch in diameter and smaller shall be stainless steel. Nuts and bolts for couplings larger than 2 inches in diameter shall be stainless steel type 304.─Stainless steel nuts or bolts shall be factory coated with anti-seize material.

(C) Repair Clamps.

REMOVE PARAGRAPH THREE AND REPLACE WITH THE FOLLOWING:

All repair clamp components shall be constructed of Type 304 stainless steel. The gasket shall consist of gridded rubber material having tapered ends suitable for the liquid in the pipeline.

REMOVE PARAGRAPH FOUR AND REPLACE WITH THE FOLLOWING:

Repair clamps smaller than 2-inch in diameter shall have stainless steel nuts and bolts. Nuts or bolts shall be factory coated with anti-seize material.

1440.0301 Installation.

(A) General.

REMOVE PARAGRAPH TWO AND REPLACE WITH THE FOLLOWING:

All fittings, flexible couplings, and repair clamps, which are to be buried, shall be encased with 8 mil polyethylene in accordance with AWWA C105, Method C.

MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1445, PRIVATE PLUMBING

REMOVE THE ENTIRE SECTION AND REPLACE WITH THE FOLLOWING:

1445.0100 GENERAL

1445.0101 Description of Work

The work under this section shall consist of furnishing all labor, materials, equipment and incidental fittings required for the installation of private plumbing, all in accordance with the details shown on the plans and the requirements of these specifications and of the International Plumbing Code. Where there is conflict between the plans and specifications and the International Plumbing Code, the more stringent requirements shall apply. The Contractor or Sub-Contractor (from hereon referred to as the Plumber) shall, under this section, relocate meters and meter boxes; install new meters and meter boxes; install new service lines and abandon existing waterline as called for in the specifications or shown on the approved plans. Meter relocation sketches shall also be used by the Plumber to prepare "as-built" location of private plumbing. The Plumber shall remove existing meters, meter boxes and abandon existing water mains (per Standard Detail SD-350) once the new meter and service line is approved by the permit inspector. The Plumber shall work on private property with a signed Right of Entry form to install new private plumbing from a point of connection as detailed on the plans to the new meter location. Any deviation from this method shall be approved by the Project Inspector and shall be in accordance with the latest edition of the International Plumbing Code Standards.

1445.0102 Permits

The Contractor is required to obtain permits from Pima County Development Services Center, for private plumbing work.

A permit will be required for each address receiving private plumbing. The cost of permits shall be incidental to the private plumbing work covered under this specification.

1445.0103 Plumbing Coordination

The Contractor shall assign a person to document and coordinate all private plumbing work, meter work, and abandonment of old water mains and all other associated work required (from hereon referred to as the Plumbing Coordinator). To assist the Contractor, a checklist is provided at the end of this Specification. This Coordinator must be assigned prior to commencement of any work and must attend the project pre-construction meeting.

The Coordinator shall be available to the Project Inspector, Pima County Inspector and

the Property Owners for the duration of the contract. The Coordinator shall be available to meet with homeowners before or after normal work hours and weekends. The Coordinator shall be at the construction site during all private plumbing work. During private plumbing work, and on a weekly basis, the Coordinator shall organize a field meeting with the Project Inspector (from hereon referred to as Inspector) to coordinate scheduling and resolve construction conflicts.

The Coordinator shall be available to assist the Owner in its effort to resolve any unsigned right-of-entry forms prior to construction. Where possible the Owner had indicated the proposed private side plumbing route based on a visual inspection of the property, which is subject to change once contact with the property owner occurs.

Before construction, the Coordinator shall verify the locations, size and meter number of each existing meter. This information will be compared with the plans and other project documentation to provide the Engineer with any errors or omissions found.

Locations for the new meter and private plumbing as shown on the approved plans are approximate and adjustment in the field shall be made as required.

1445.0200 PRODUCTS

1445.0201 Materials.

New private plumbing service line sizes shall be 2" unless otherwise noted on the approved meter relocation sketch.

Material shall include PVC, HDPE, or copper pipe, ball valve, ball valve fittings, insulation, and appurtenances required to install private plumbing and connections. Insulation for exposed pipe shall be Luma Wrap or Armstrong Armaflex insulation or Engineer approved equal. Approval of an equal must be requested ten (10) days prior to expected use.

Approved private plumbing service line material shall be Schedule 40 PVC, HDPE or copper, unless specifically noted on the meter relocation sketch.

Public side service connections and materials including new meter boxes and Roman bricks shall be covered by Standard Specification Section's 1416, 1446, and Standard Detail MW-309.

1445.0300 EXECUTION

1445.0301 General.

The Contractor or Plumber shall furnish and install all labor and materials required to connect private plumbing to the distribution system per International Plumbing Code and/or Tucson Water Standards and Specifications and Metro Water Supplemental Specifications whichever is the most stringent.

1445.0302 Installation.

The Contractor is responsible to restore the work area to its original conditions. The Contractor shall establish a detailed video record of pre-construction conditions prior to commencing the work for each address that identifies existing features such as vegetation, fences, permanent and temporary structures. The Contractor shall review this record with the Project Inspector before each address is started.

Private plumbing work shall begin after Coordinator has field verified the size, location and meter number of the existing meter and service line shown on the plans and after installation and acceptance by MDWID of new public water mains and water service stubs.

Work on private property will not begin until: the Contractor has received a signed Right of Entry form with drawing attached; informed the Engineer of any errors and omissions; and given 48 hours advanced notification to the property owner and Engineer's representative.

The Contractor shall submit detailed as-built drawings for all private plumbing work indicating the point of connection with distances. These as-built drawings must be submitted prior to the release of any retention money. The costs for as-built drawings shall be included in the bid item for private plumbing.

The Contractor will coordinate their work with all work done on private property by the Plumber.

The Contractor may not begin work to abandon services and cut and plug water mains until private plumbing is connected and in service.

Private plumbing work by the Plumber shall include installation of private plumbing service line, ball valve fittings, ball valve (resetting of meter box per MDWID Standard Detail MW-309 as appropriate), testing, connections to existing private plumbing and water meter.

Locations for new private plumbing service lines as shown within these specifications and on approved plans are approximate; adjustment in the field may be required.

The Coordinator shall give two (2) working days advance notice to affected property owners that work is going to be done on their property. Written notices to property owners shall be furnished by the Coordinator. Notices shall be effective at 5:00 p.m. on the day posted and shall exclude weekends and holidays.

The Coordinator shall furnish documented proof to the Inspector that prior notice was given to affected property owners. Date of notice shall be included.

The Coordinator shall coordinate all work accomplished on private property with affected property owners.

1445.0303 Workmanship.

All work shall meet or exceed International Plumbing Code standards adopted by the Pima County. This includes any electrical grounding construction necessary to meet code. Any costs for electrical grounding construction shall be included in the price for the private service line bid item.

All work on private plumbing service lines, from the house connection to the angle meter stop, shall be performed by licensed plumbers. Proof of required certification or licensing shall be furnished to MDWID at least two (2) weeks prior to commencement of any work.

All obstructions, including existing utility services lines, shall be protected from damage by the Contractor and Plumber during construction and until completion of work. All damaged private service utilities, landscaping, improvements and obstructions are to be replaced in accordance with MDWID Standard Detail MW-105, and these Technical Specifications and shall be included in the private service line bid item.

New service stubs, private plumbing service lines, and new mains shall be tested, and flushed prior to setting of water meter and connection to the remaining private plumbing.

The Plumber shall trench through private property to the point of connection at the front, side or rear of the property as required by the plans and approved by the Inspector and the property owner. New private plumbing work shall have 18" minimum cover.

Inspection of trench and pipe material on private property shall be conducted by a Pima County Development Services Plumbing Inspector. Pima County Development Services will require 24 hour advance notice prior to inspection in accordance with their standard notification procedure.

All new service lines shall be bedded in screened native material. Bedding shall not include material greater than ½" diameter, cinders, debris or other deleterious materials.

Visual test for leaks and seepage shall be conducted under system pressure only. All pipe joints shall be completely exposed for the duration of the visual test. At the end of two hours, Development Services shall pressure test each joint, fitting, and valve, and be examined for leaks. The prescribed test pressure shall be maintained for the duration of the visual test inspection and examination. The lines shall be considered as having successfully passed the test when there is no leakage or seepage of any type at any joint, connection, or fitting.

The plumber shall flush lines sufficiently to remove all taste and odor of PVC solvent after pressure tests and prior to connecting to new water meter. The Contractor shall then coordinate with the property owner to flush the house interior plumbing.

Acceptability of the new private plumbing line shall be determined by Successful completion of the Development Services visual tests for leaks and seepage and approval by the MDWID Inspector.

Contractor shall submit detailed as-built drawings for private plumbing work, indicating point at connection with distances. These as-built drawings must be submitted prior to the release of any retention money.

All private plumbing work or related work shall be in accordance with the following checklist. The checklist shall be verified for each lot with new private plumbing.

The Plumber shall compact the backfill over the installed private plumbing to a minimum of 85% in open areas and 90% minimum to driveway areas and within three feet (3') of permanent structures, walls, foundations, etc.

The trench is to be of minimum width necessary for the proper laying and backfilling of the pipe as determined by the Plumber and approved by the Inspector.

Where existing obstructions on private property prohibit installing new private plumbing service lines by trenching the Plumber may tunnel or drive. Tunneling or driving shall be in accordance with Section 306.4 of the International Plumbing Code. The Coordinator shall submit a detailed plan of boring and driving to MDWID for approval. Boring or driving shall not be done until a detailed plan is approved by MDWID. Tunneling or driving shall not be a separate bid item and shall be included in the cost for private plumbing.

( ) 1. Contractor shall install new public water mains as shown on Contract Drawings.

( ) 2. Contractor shall tap new water main in accordance with MDWID Standard Detail MW-309. Service taps shall be aligned with new meter box location. The public water main and service connection must be inspected, tested and accepted by MDWID prior to commencement at private plumbing service line construction.

( ) 3. The Coordinator shall review the size, location and meter number of the existing meter and the location of the proposed private plumbing service line, as shown on the meter relocation sketch, with the Homeowner and Inspector.

( ) 4. The Contractor shall provide two (2) working days advance notice to affected property owners and Inspector for private plumbing work on private property. Notices shall be effective at 5:00 p.m. on the day posted and shall exclude weekends and holidays.

( ) 5. The Plumber shall trench and install private plumbing service line to the point of connection from the new meter location. Determine need for electrical grounding per Pima County Building Codes. Install

required electrical grounding.

( ) 6. The Plumber shall open ball valve slowly at meter in street. Flush air out of service line.

( ) 7. The Coordinator shall notify property owner of service disruption.

( ) 8. The Plumber shall close valve at existing meter.

( ) 9. Test of leaks and seepage on private plumbing shall be witnessed by Development Services Inspector.

( ) 10. The Plumber shall flush new private plumbing through angle meter stop at new meter location.

( ) 11. The Plumber shall connect private plumbing line to existing house plumbing after flushing new private plumbing. Check point of connection for leaks and seepage.

( ) 12. The Coordinator shall notify property owner service is restored.

( ) 13. The Plumber shall backfill trench and repair damage to property.

( ) 14. The Plumber shall close valve at existing meter in alley/easement.

( ) 15. The Plumber shall reset meter box in accordance with MDWID Standard Detail MW-309 as appropriate.

( ) 16. The Plumber shall cut and plug old service line in accordance with the Private Plumbing Detail.

MODIFICATIONS TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1446, WATER METERS

1446.0100 GENERAL

1446.0102 Related Specifications.

REMOVE THIS ENTIRE SECTION:

1446.0104 Delivery, Storage and Handling.

CHANGE PARAGRAPH ONE AS FOLLOWS:

Water meters shall be stored and handled in accordance with the manufacturer's instructions except as may be modified by the plans, special specifications, or as directed by the Engineer.

1446.0301 Installation.

(A) General.

ADD THE FOLLOWING BEFORE PARAGRAPH ONE:

Unless otherwise shown on the plans or special specifications, water meters shall be provided and installed by MDWID. Meter fees are to be paid by the customer/applicant at established fees prior to installation.

MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1450, MEASUREMENT AND PAYMENT

REMOVE THIS ENTIRE SECTION AND REPLACE WITH THE FOLLOWING:

Where applicable, measurement and payment criteria shall be shown on the plans or special specifications.

SUPPLEMENTAL SPECIFICATION FOR BACKFLOW PREVENTION

100 GENERAL Backflow prevention shall be installed on all new commercial, irrigation, and multi-family services. The MDWID Backflow Prevention Inspector shall approve the type of backflow prevention assembly prior to installation. Backflow requirements for existing services will be determined by degree of hazard and will be evaluated on a case by case basis. Any requests for a variance shall be submitted in writing to the MDWID Backflow Prevention inspector for evaluation. No modification to this specification or variance shall be approved except by the MDWID District Engineer.

101 Description of Work. The work under this section shall consist of furnishing all labor, materials and equipment required for the installation of backflow prevention in accordance with the requirements of these specifications and the MDWID Backflow Prevention Control Ordinance, Ordinance No. 1993-01.

102 Workmanship. All personnel of the contractor or his/her subcontractors shall be skilled and knowledgeable with regard to the installation procedures for backflow prevention assemblies.

103 Submittals. Where backflow prevention is required, the water meter will not be installed until the MDWID Backflow Prevention Inspector has approved the backflow prevention assembly installation. Backflow prevention assemblies are required to be tested upon installation, repair, and annually. Testing shall be done by a "Certified Backflow Prevention Assembly Tester" recognized by MDWID. A list of approved testers is available on request. Test reports shall be submitted to the MDWID. A list of approved testers is available on request. Test reports shall be submitted to the MDWID Backflow Prevention Inspector within three days after the test and no later than five working days following the water meter installation. Failure to comply with testing requirements will result in water service being discontinued until testing requirements are met.

200 PRODUCTS

201 Materials. Only backflow prevention assemblies that have been issued an approval by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR) or another nationally recognized laboratory with equal testing criteria will be authorized by MDWID.

300 EXECUTION

301 General. Backflow prevention shall be installed on fire sprinkler systems that contain chemical additives, or have the potential to be supplied from an auxiliary water source. Before installing a backflow prevention assembly on a fire system, consult with the fire authority for additional requirements.

The installation of a backflow prevention assembly, pressure-reducing, or check valve may create a closed system. Consult local plumbing codes for pressure relief valve and thermal expansion requirements.

BACKFLOW PREVENTION

A permit is required prior to the installation of any backflow prevention assembly. Permits may be obtained from the MDWID Backflow Prevention Inspector.

302 Installation.

(A) General. Backflow prevention assemblies shall be installed in accordance with the manufacturer's recommendations, the adopted International Plumbing Code (IPC) current edition as adopted by the Pima County Development Services Department, and MDWID Specifications and Details. Where a conflict exists, the more stringent standard shall apply.

Backflow prevention assemblies shall be installed as close as possible to the water meter and on private property (right-of-way is not considered private property) unless otherwise approved.

There shall be no unprotected connections between the water meter and the backflow prevention assembly. Additional connections between the water meter and the backflow prevention assembly shall require additional backflow prevention assemblies.

Backflow prevention assemblies shall be installed with IPC approved metal piping, except that type "M" copper shall not be allowed.

Before installing a backflow assembly on any fire system, consult with the local fire authority for additional requirements.

All piping and appurtenances of backflow prevention assembly installations shall remain visible until approved by the MDWID Backflow Prevention Inspector.

The installation of protective cages is optional. If protective cages are installed, they shall allow for clearance and accessibility. Protective cages shall comply with the backflow prevention assembly manufacturers drainage requirements.

Backflow prevention assemblies should be protected from the elements in accordance with the manufacturer's recommendations. Protection shall not hinder the operation of air inlets and water dump outlets.

The installation of a backflow assembly may create a closed system. Consult the local plumbing code for pressure relief valve and thermal expansion requirements.

(B) Air Gap (AG). AG is defined as the distance between the discharge pipe and the top of the flood rim of the receiving vessel. The AG shall be twice the diameter of the effective opening of the discharge pipe and in no case less than 1 inch (1"), see MDWID Standard Detail MW-1800.

All piping to an AG shall be exposed. Tanks or vessels where the piping of the AG is not visible shall not be accepted. There shall be no provisions for extending the length of the discharge pipe.

(C) **Reduced Pressure Assembly (RPA).** The RPA shall be installed outside, above ground, and as close as practical to the water meter unless otherwise approved. If inside installation is approved, the UPC and manufacturer's drainage requirements must be met.

The RPA shall not be installed below ground or in a vault, see MDWID Standard Detail MW-1800.

(D) **Pressure Vacuum Breaker (PVB).** The PVB shall be installed 12 inches (12") above the highest downstream outlet, but no more than 36 inches (36") above ground, see MDWID Standard Detail MW-1800.

The PVB shall only be allowed on irrigation services.

There shall be no means of inducing backpressure to the PVB.

No chemical injection shall be allowed with the use of the PVB.

If the above criteria cannot be met, an RPA must be installed.

(E) **Mobile Units.** The MDWID Backflow Prevention Inspector shall approve backflow prevention for mobile units (water trucks, kline tanks, etc.) prior to authorization for use.

If a reduced pressure assembly is used as backflow prevention for mobile units, the contractor shall provide MDWID a copy of the certified test report for the assembly prior to authorization for use.

See MDWID Standard Detail MW-1800 for installation and assembly details.

(F) **Double Check Valve Assembly (DCVA).** The DCVA shall be allowed on low hazard installations only as determined by the MDWID Backflow Prevention Inspector.

The DCVA shall not be installed below ground or in a vault, see MDWID Standard Detail MW-1800.

(G) **Spill Resistant Vacuum Breaker (SVB).** The SVB shall follow the same installation requirements as the PVB.

SUPPLEMENTAL DETAILS

MDWID STANDARD WATER DETAILS

Modification to Tucson Water Standard Detail SD-105
MW-105 GENERAL CONSTRUCTION NOTES

Modification to Tucson Water Standard Detail SD-108
REMOVED JOINT USE TRENCH

Modifcation to Tucson Water Standard Detail SD-110
MW-110 CUSTOMER NOTIFICATION

Modification to Tucson Water Standard Detail SD-115
MW-115 PIPE BEDDING AND TRENCH BACKFILL

Modification to Tucson Water Standard Detail SD-116
MW-116 TRACER WIRE & POLYETHYLENE WARNING TAPE

Modificaiton to Tucson Water Standard Detail SD-300, Sheet 3 of 3 only
MW-300 WATER VALVE BOX AND COVER

Modification to Tucson Water Standard Detail SD-305, Sheet 1 of 2 only
MW-305 VALVE NUT EXTENSION

Modification to Tucson Water Standard Detail SD-310
MW-309 WATER SERVICE CONNECTION

Modification to Tucson Water Standard Detail SD-314
REMOVED STANDARD LARGE METER ENCLOSURE

Modification to Tucson Water Standard Detail SD-330
MW-330 COMBINATION AIR / VACUUM RELEASE VALVE

Modification to Tucson Water Standard Detail SD-331
REMOVED AIR RELEASE VALVE INSTALLATION 2"

Modification to Tucson Water Standard Detail SD-400
MW-400 DRAIN VALVE ASSEMBLY (EXISTING CONSTRUCTION)

Modification to Tucson Water Standard Detail SD-405
MW-405 DRAIN VALVE ASSEMBLY (NEW CONSTRUCTION)

Modification to Tucson Water Standard Detail SD-500
MW-500 FIRE HYDRANT INSTALATION

Modification to Tucson Water Standard Detail SD-600
MW-600 RESTRAINED JOINTS
MW-600A RESTRAINED JOINT EXAMPLES

MDWID STANDARD WATER DETAILS CON'T.

Modification to Tucson Water Standard Detail SD-610
MW-610 CONCRETE VALVE THRUST BLOCK

Modification to Tucson Water Standard Detail SD-1700
REMOVED CONSTRUCTION SITE SIGN

Modification to Tucson Water Standard Detail SD-1705
REMOVED CONSTRUCTION SITE SIGN (RECLAIMED)

Modification to Tucson Water Standard Detail SD-1800
MW-1800 AIR GAP (AG) SEPARATION INSTALLATION

Modification to Tucson Water Standard Detail SD-1850
MW-1850 PLAN SYMBOLS

APPENDIX A

Modification to Tucson Water Approved Materials List
A. APPROVED LIST OF MATERIALS AND COMPONENTS

1. ALL CONSTRUCTION SHALL CONFORM TO TUCSON WATER STANDARD SPECIFICATIONS AND DETAILS AND PIMA COUNTY/CITY OF TUCSON JOINT STANDARD SPECIFICATIONS AND DETAILS, OR AS AMENDED BY THE METROPOLITAN DOMESTIC IMPROVEMENT DISTRICT (MDWID), ALONG WITH ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY BULLETIN 10. ALL WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED BY THE STATE OF ARIZONA, AS DETERMINED BY THE ARIZONA REGISTRAR OF CONTRACTORS (A, A-12, A-16, K-80 AND KA). A COPY OF THE LATEST EDITION OF SAID SPECIFICATIONS AND DETAILS SHALL BE ON THE PROJECT SITE AT ALL TIMES.

2. ALL MATERIALS USED SHALL BE NEW AND MUST APPEAR IN THE APPROVED MATERIALS LIST, APPENDIX A OF THE MDWID SUPPLEMENTAL SPECIFICATION AND DETAILS.

3. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES.

4. CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT TO CONSTRUCT TO MDWID A MINIMUM OF TWO (2) WEEKS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL OBTAIN A WATER LINE CONSTRUCTION PERMIT A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO THE START OF ANY CONSTRUCTION OR IMPROVEMENTS TO THE EXISTING MDWID WATER SYSTEM.

5. PRE-CONSTRUCTION PROCEDURE:

   A. ALL PLANS MUST BE APPROVED BY MDWID PRIOR TO START OF CONSTRUCTION.

   B. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING WITH A MDWID CONSTRUCTION INSPECTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION ON THE PROPOSED PUBLIC WATER SYSTEM. THE MEETING SHALL BE SCHEDULED A MINIMUM OF THREE (3) DAYS PRIOR TO THE START OF CONSTRUCTION OF THE NEW WATERLINE. CONSTRUCTION OF THE NEW SYSTEM WILL NOT BE AUTHORIZED UNTIL SAID MEETING HAS BEEN CONDUCTED. CALL THE MDWID ENGINEERING DIVISION AT 520-575-8100 TO SCHEDULE THE MEETING.

   C. ANY PIPE INSTALLED PRIOR TO THE PRE-CONSTRUCTION MEETING WILL BE REMOVED BY THE CONTRACTOR AT THE CONTRACTOR'S SOLE EXPENSE.

6. ALL SUBMITTALS MUST INCLUDE THE MDWID PLAN NUMBER OR THEY WILL NOT BE ACCEPTED.

7. LAYOUT/CUT SHEET SUBMITTAL:

8. NOTE: AN EXAMPLE OF THE STANDARD LAYOUT/CUT SHEET FORMS ARE ATTACHED HERETO FOR REFERENCE. THEY ARE AVAILABLE BY CONTACTING THE MDWID ENGINEERING DIVISION OFFICE. NO OTHER FORMAT WILL BE ACCEPTED.

   A) ONLY COMPLETE, OFFICIAL MDWID LAYOUT/CUT SHEETS WILL BE ACCEPTED. LAYOUT/CUT SHEETS SHALL BE SUBMITTED TO THE MDWID ENGINEERING DIVISION PRIOR TO THE START OF CONSTRUCTION. THESE LAYOUT/CUT SHEETS SHALL SHOW ALL STATIONING AND CUTS FOR ALL VALVES, CONNECTIONS, HYDRANTS, SERVICES, FITTINGS, ETC. TO BE INCLUDED IN THE PROPOSED SYSTEM. STATIONING MUST BEGIN AT A KNOWN PERMANENT POINT (SUCH AS SURVEY MONUMENT OR PROPERTY PIN) WHICH WILL REMAIN VISIBLE AFTER COMPLETION OF CONSTRUCTION. LAYOUT/CUT SHEETS MAY BE SUBMITTED IN PHASES ON LARGE PROJECTS. NO WORK IS ALLOWED IN AREAS THAT HAVE NO APPROVED LAYOUT/CUT SHEETS.

   B) CURVES WITH A RADIUS OF 300 FEET OR LESS SHALL BE STATIONED EVERY 25 FEET (25'). CURVES WITH A RADIUS OF GREATER THAN 300 FEET SHALL BE STATIONED AT A MINIMUM OF

50 FOOT (50') INTERVALS.

C) CUTS FOR THE END LOCATION OF SERVICES, FIRE HYDRANTS, AND FIRE HYDRANT OR FIRE SERVICE STUB-OUTS SHALL BE SHOWN TO THE TOP OF CURB, OR TO FINAL GRADE WHERE NOT CURB IS TO BE CONSTRUCTED. STATIONING AND CUTS FOR FIRE HYDRANTS AND FIRE HYDRANT STUB-OUTS SHALL BE SHOWN BOTH AT THE MAIN AND AT THEIR END LOCATIONS. STATIONING AND CUTS FOR SERVICES SHALL BE SHOWN AT THEIR END LOCATIONS ONLY.

D) LAYOUT/CUT SHEETS SHALL SHOW ANY SPECIAL CONDITIONS SUCH AS EXTRA CUTS, EXTRA COVER, DRAINAGE WAYS, ETC.

E) CONSTRUCTION STAKING SHALL REFLECT THE INFORMATION SHOWN ON THE LAYOUT/CUT SHEETS. STATIONING AND CUTS SHOWN ON THE LAYOUT/CUT SHEETS SHALL BE HAND LETTERED ON THE GRADE STAKES. THE DISTANCE AND DIRECTION OF THE OFFSET LINE (N, S, E, OR W) SHALL BE SHOWN IN RELATION TO THE WATERLINE (I.E., IF THE OFFSET LINE IS TEN FEET NORTH OF THE WATERLINE, THE OFFSET DISTANCE AND DIRECTION WILL BE "10' N").

F) OFFSET HUBS SHALL BE SET FAR ENOUGH AWAY FROM TRENCH CENTERLINE TO AVOID BEING LOST DUE TO EXCAVATION OR CAVE-INS, LOST OR DAMAGED STAKING SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S SOLE EXPENSE.

G) IF INVERTS ARE PROVIDED ON THE APPROVED PLANS, HUB ELEVATIONS FOR THE OFFSET LINE MUST BE SHOWN IN THE "DESCRIPTION" COLUMN AT THE "MINIMUM COVER REQURIED".

H) A REGISTERED LAND SURVEYOR MUST CERTIFY THAT THE ELEVATIONS ON THE OFFICIAL MDWID LAYOUT/CUT SHEETS ARE THE EXISTING ELEVATIONS AND PROPOSED FINAL GRADES AS OF THE DATE OF SURVEY. HOWEVER, THE NEW MAIN SHALL NEVER HAVE LESS THAN 36" COVER AFTER ACCEPTANCE.

I) THE CONTRACTOR, AT THE CONTRACTOR'S SOLE EXPENSE, SHALL REPLACE "IN-KIND" ANY EXISTING SURVEY MONUMENTATION DAMAGED OR DISTURBED DURING CONSTRUCTION (INCLUDING PROPERTY PINS). REPLACEMENT SHALL BE MADE BY AN ARIZONA REGISTERED LAND SURVEYOR AND A "RECORD OF SURVEY" WILL BE REQUIRED.

J) PLAN REVISIONS WILL REQUIRE NEW LAYOUT/CUT SHEETS.

9. THE CONTRACTOR IS REQUIRED TO CONTACT BLUE STAKE TWO (2) WORKING DAY PRIOR TO ANY EXCAVATION TO DETERMINE ACCURATE UTILITY LOCATIONS. THE CONTRACTOR MUST KEEP ALL BLUE STAKE REQUESTS UP TO DATE, AND COMPLY WITH APPLICABLE ARIZONA REVISED STATUTE PERTAINING TO BLUE STAKE.

10. WATER MAINS SHALL BE INSTALLED AFTER SEWER INSTALLATION AND AFTER ROUGH GRADING UNLESS OTHERWISE APPROVED BY MDWID. ROUGH GRADE SHALL BE WITHIN SIX INCHES (6") OF FINAL GRADE.

11. WATER MAINS SHALL BE INSTALLED WITH A MINIMUM OF 44 INCHES (44") OF COVER FROM FINAL GRADE EXCEPT AS OTHERWISE NOTED ON THE APPROVED PLANS.

12. WATER MAINS INSTALLED WITHIN EXISTING RIGHTS-OF-WAY THAT ARE NOT AT FINAL GRADE SHALL BE INSTALLED WITH A MINIMUM OF SIXTY INCHES (60") OF COVER FROM THE FUTURE FINAL GRADE EXCEPT AS OTHERWISE NOTED ON THE APPROVED PLANS. IT SHALL BE

THE RESPONSIBILITY OF THE OWNER/DEVELOPER TO OBTAIN ACCEPTANCE FROM THE AGENCY WHICH HAS JURISDICTION OVER THE RIGHT-OF-WAY.

13. ADEQUATE MATERIAL QUANTITIES OF ABC AND COLD PAVEMENT PATCH MIX TO MAKE TEMPORARY COLD PATCH MUST BE ON THE JOB SITE BEFORE CUTTING EXISTING PAVEMENT.

14. ALL MATERIAL AND EQUIPMENT REQUIRED FOR A CONNECTION OR TIE-IN MUST BE ON THE JOB SITE BEFORE AUTHORIZATION WILL BE GIVEN TO COMMENCE WORK.

15. BACKFILL MATERIAL AND COMPACTION SHALL BE IN ACCORDANCE WITH MDWID STANDARD DETAIL MW-115. THE INSPECTOR HAS BEEN AUTHORIZED TO ENSURE COMPLIANCE WITH THE REQUIREMENTS OF OTHER AUTHORITIES.

    BACKFILLING SHALL BE IN ACCORDANCE WITH PIMA COUNTY/CITY OF TUCSON STANDARD SPECIFICATION, THE LATEST VERSION (SECTION 923-UTILITY INSTALLATION WITHIN PUBLIC RIGHTS-OF-WAY), OR THE AGENCY WHICH HAS JURISDICTION OVER THE RIGHT-OF-WAY. THE CONTRACTOR MUST PROVIDE EVIDENCE THAT THE MATERIAL MEETS CURRENT COMPACTION REQUIREMENTS. THE TEST MUST BE PERFORMED BY A RECOGNIZED TESTING LABORATORY AND BE SUBMITTED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

    A MINIMUM OF ONE (1) TEST IS REQUIRED PER 500 FEET OF TRENCHING LENGTH OR A PORTION THEREOF, PER EVERY THREE (3) FEET OF TRENCH DEPTH OR PORTION THEREOF, THE DISTRICT ENGINEER OR DESIGNATED REPRESENTATIVE MAY REQUIRE ADDITIONAL TESTS ANYWHERE WITHIN THE BACKFILL PRISM.

16. A POLYETHYLENE WARNING TAPE WITH CONTINUOUS PRINTING IN BLACK LETTERS STATING "CAUTION-BURIED WATER LINE BELOW" AND ONE (1) #10 AWG SOLID TYPE UF/UL, RHW, OR RHH COPPER WIRE SHALL BE INSTALLED PER MDWID STANDARD DETAIL MW-115. UPON COMPLETION OF BACKFILL AND BEFORE SUB-GRADE WORK, THE CONTRACTOR SHALL VERIFY CONTINUITY OF TRACER WIRE IN THE PRESENCE OF THE MDWID INSPECTOR.

17. ALL BURIED METAL SURFACES, INCLUDING VALVES, NUTS AND BOLTS, AND ODD SHAPED APPURTENANCES, SHALL BE PROTECTED WITH POLYETHYLENE ENCASEMENT SECURED WITH ADHESIVE TAPE PER AWWA C105, METHOD A OR C AS APPLICABLE. COPPER SERVICE MATERIALS DO NOT REQUIRE POLYETHYLENE ENCASEMENT.

18. "JOINT-USE TRENCH" WITH WATER AND OTHER UTILITIES WILL NOT BE PERMITTED.

    WHEN ELECTRIC, TELEPHONE, OR GAS FACILITIES PARALLEL WATER FACILITIES, THEY SHALL NOT BE INSTALLED WITH LESS THAN FIVE FEET (5') HORIZONTAL CLEARANCE FROM THE WATER MAIN.

19. ONLY APPROVED PLANS OR APPROVED REVISIONS SHALL BE USED FOR THE INSTALLATION OF WATER FACILITIES. IN INSTANCES WHERE FIELD CONDITIONS, PROPOSED CONSTRUCTION, OR DESIGN CONSTRAINTS REQUIRE CHANGES IN THE ORIGINAL APPROVED DRAWINGS OR INSTALLATION, SUCH CHANGES SHALL BE APPROVED BY MDWID AND WILL BE AT NOT EXPENSE TO MDWID.

20. IF SEPARATION REQUIREMENTS BETWEEN A PUBLIC WATER PIPE AND SEWER MAIN, CMP, OR OTHER DRAINAGE STRUCTURE CANNOT BE MET, REVISIONS TO THE PLANS WILL BE REQUIRED. PLANS WILL BE SUBMITTED TO AND APPROVED BY MDWID PRIOR TO CONTINUING CONSTRUCTION.

21. RECLAIMED WATER MAINS SHALL MEET "POTABLE WATER MAIN" CRITERIA WHEN INSTALLED ADJACENT TO SEWER MAINS. RECLAIMED WATER MAINS SHALL MEET "SEWER MAIN" CRITERIA WHEN INSTALLED ADJACENT TO POTABLE WATER MAINS.

METRO WATER DISTRICT

GENERAL CONSTRUCTION NOTES

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 09/2016

S.D.# MW-105

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22. EXISTING DEAD-END MAINS SHALL BE THOROUGHLY FLUSHED BEFORE TIE-INS ARE MADE TO THE NEW MAINS.

23. USE OF 'HIGH EARLY' CONCRETE IS APPROVED FOR USE IN CONCRETE THRUST BLOCKS. CONCRETE SHALL REMAIN OPEN AND NO BACKFILL MAY OCCUR UNTIL DESIGN STRENGTH IS ATTAINED.

24. FIRE HYDRANTS SHALL BE SET AT CURB RETURNS, COMMON LOT LINES, OR AS INDICATED ON APPROVED PLANS, AS DIRECTED BY THE AGENCY WHICH HAS JURISDICTION OVER THE RIGHT-OF-WAY, AND IN ACCORDANCE WITH TUCSON WATER STANDARD DETAIL SD-500.

25. SET ANGLE METER STOPS EIGHTEEN INCHES (18") BEHIND BACK OF CURB OR SIDEWALK WHERE EITHER EXISTS AND SIX INCHES (6") MINIMUM TO NINE INCHES (9") MAXIMUM BELOW THE TOP OF METER BOX IN ACCORDANCE WITH MDWID STANDARD DETAILS MW-309.

26. SET ANGLE METER STOPS EIGHTEEN INCHES (18") MINIMUM FROM PROPERTY LINE IN STREETS WITHOUT CURBS, AND SIX INCHES (6") MINIMUM TO NINE INCHES (9") MAXIMUM BELOW THE TOP OF METER BOX IN ACCORDANCE WITH MDWID STANDARD DETAILS MW-309.

27. ANGLE METER STOPS SHALL NOT BE INSTALLED AT THE SAME LOT CORNER AS THE ELECTRIC SERVICE OR TRANSFORMER. WHERE THIS CANNOT BE ACCOMPLISHED, THE WATER SERVICE AND THE ELECTRICAL SERVICE OR TRANSFORMER MUST HAVE A MINIMUM HORIZONTAL SEPARATION OF 10'-0".

28. THE CONTRACTOR SHALL INSTALL A THREE FOOT (3') PIECE OF #9 GALVANIZED WIRE TIED TO THE LOCKING TAB IN ACCORDANCE WITH MDWID STANDARD DETAILS MW-309. ALL METER BOXES SHALL BE PROVIDED BY THE OWNER/DEVELOPER AND INSTALLED BY THE CONTRACTOR PRIOR TO THE INSTALLATION OF WATER METERS. UPON INSTALLATION OF THE METER BOX, WIRE SHALL BE COILED INSIDE METER BOX.

29. THE CONTRACTOR SHALL HAVE ALL WATER VALVES IDENTIFIED AND LOCATED PRIOR TO PAVING AND SHALL HAVE ALL VALVE BOXES SET TO FINAL GRADE AFTER PAVING IN ACCORDANCE WITH TUCSON WATER STANDARD DETAIL SD-300, EXCEPT AS MODIFIED BY MDWID.

30. THE PROJECT WILL NOT BE ACCEPTED IF IT INCLUDES ANY WORK THAT IS NOT SHOWN ON APPROVED PLANS, APPROVED REVISIONS, OR OTHERWISE APPROVED BY MDWID.

31. THE PROJECT WILL NOT BE GRANTED FINAL ACCEPTANCE BY MDWID UNTIL THE FOLLOWING DATA HAS BEEN SUBMITTED AND APPROVED: CUT SHEETS, MATERIAL LIST, DENSITY TEST RESULTS, HYDROSTATIC PRSSURE TEST RESULTS, MICROBIOLOGICAL TEST RESULTS, POST PAVING INSPECTION, APPROVED PLANS, APPROVED REVISIONS, "AS-BUILT" PLANS, AND ADDITIONAL REQUIREMENTS AS DETERMINED BY MDWID.

32. WHERE EXISTING WATER SERVICES ARE TO BE RELOCATED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATING THOSE SERVICES TO THE NEW LOCATIONS AS SHOWN ON THE APPROVED PLANS. RELOCATION WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, NEW SERVICE SADDLES AND TAPS, NEW SERVICE PIPE, ANGLE METER STOPS, BALL VALVES, METER BOXES, ALL WORK NECESSARY TO RECONNECT THE PRIVATE PLUMBING AND ANY AND ALL WORK SPECIFICALLY MENTIONED. THE CONTRACTOR SHALL SALVAGE ALL EXISTING METERS AND BOXES IN ACCORDANCE WITH THE SALVAGE REQUIREMENTS INCLUDED IN NOTE 34 HEREIN. ALL SERVICES ARE TO BE TAPED ON THE SIDE OF THE MAIN FACING THE PROPERTY THAT THE METER SERVES.

33. WHERE EXISTING WATER SERVICES ARE TO BE ABANDONED, THE CONTRACTOR SHALL BE

RESPONSIBLE FOR REMOVING AND SALVAGING ALL ASSOCIATED MATERIALS RELEVANT TO THE ABANDONED SERVICE, INCLUDING CLOSING AND PLUGGING THE EXISTING CORPORATION STOP, IN ACCORDANCE WITH THE APPROVED PLANS AND THE SALVAGE REQUIREMENTS INCLUDED IN NOTE 35 HEREIN.

34. THE CONTRACTOR IS TO REMOVE ALL ABANDONED VALVE BOXES AS FOLLOWS:

A) UNPAVED AREAS:

THE CONCRETE COLLAR SHALL BE TOTALLY BROKEN, REMOVED, AND PROPERLY DISPOSED OF OFF THE JOB SITE BY THE CONTRACTOR. THE VALVE BOX AND LID SHALL BE SALVAGED IN ACCORDANCE WITH NOTE 34 HEREIN. RISER PIPE SHALL BE CUT A MINIMUM OF FIFTEEN INCHES (15") BELOW FINISHED GRADE. SURPLUS BROKEN CEMENT–ASBESTOS SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS INCLUDED IN NOTE 34, ITEM B HEREIN.

B) PAVED AREAS:

A SQUARE, 2'–6" BY 2'–6" MINIMUM, SHALL BE SAW–CUT AROUND THE VALVE BOX AND LID. THE CONCRETE COLLAR SHALL BE TOTALLY BROKEN AND REMOVED. THE VALVE BOX AND LID SHALL BE SALVAGED. RISERS SHALL BE CUT A MINIMUM 15 INCHES (15") BELOW FINISHED GRADE. SURPLUS BROKEN CEMENT–ASBESTOS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS INCLUDED IN NOTE 34, ITEM B HEREIN. THE RISER SHALL BE FILLED WITH AGGREGATE BASE COURSE. AGGREGATE BASE COURSE SHALL CONFORM TO THE REQUIREMENTS OF PC/COT SECTION 923–2.03. THE AREA DISTURBED BY THIS SALVAGE OPERATION SHALL BE BACKFILLED WITH AGGREGATE BASE COURSE AND COMPACTED IN ACCORDANCE WITH MDWID STANDARD SPECIFICATION 0205 AND BROUGHT UP TO MATCH THE BOTTOM OF THE ASPHALT PAVEMENT. THE SQUARE SHALL THEN BE PATCHED IN ACCORDANCE WITH, AND TO THE SATISFACTION OF, THE AGENCY WHICH HAS JURISDICTION OVER THE RIGHT–OF–WAY. WHERE THIS IS NOT ACCOMPLISHED, THE CONTRACTOR SHALL, AT CONTRACTOR'S EXPENSE, REINSTALL THE PATCH AS DIRECTED BY SAID AGENCY.

35. SALVAGED MATERIALS:

A) DELIVERY OF ABANDONED WATER SYSTEM MATERIAL:

PRIOR TO DELIVERY, THE CONTRACTOR SHALL DEVELOP A LIST OF SALVAGEABLE ITEMS. THE LIST SHALL INCLUDE THE NAME AND NUMBER OF THE PROJECT, CONTRACTOR, AND PLAN NUMBER. THE PROJECT INSPECTOR WILL SIGN AND DATE THE LIST, THE LIST OF SALVAGEABLE ITEMS DELIVERED TO MDWID WILL BE SIGNED, DATED, AND RETAINED BY THE REPRESENTATIVE UPON RECEIPT OF ITEMS. REJECTED ITEMS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.

ALL VALVES, VALVE BOXES, AND FITTINGS SHALL BE DEVOID OF DIRT OR CEMENT–ASBESTOS MATERIAL BEFORE DELIVERY TO MDWID. CEMENT–ASBESTOS PIPE SHALL NOT BE DELIVERED TO MDWID AND MUST BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS INCLUDED IN NOTE 34, ITEM B HEREIN.

ALL VALVES, VALVE BOXES, FIRE HYDRANTS, AND FITTINGS REMOVED BY THE CONTRACTOR FROM THE ABANDONED WATER MAIN SYSTEM SHALL BE DELIVERED AND UNLOADED BY THE CONTRACTOR TO THE MDWID HARDY WELL SITE LOCATED AT 8801 N. MYRTLE PLACE. MDWID STAFF WILL NOT UNLOAD SALVAGED ITEMS FOR THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 24 HOURS NOTICE TO MDWID STAFF AT 520–575–8100 BEFORE DELIVERING SAID SALVAGED ITEMS.

B) CEMENT–ASBESTOS PIPE HANDLING AND TRANSFER:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER REMOVAL, TRANSFER, AND DISPOSAL OF CEMENT–ASBESTOS PIPE FROM THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE

RESPONSIBLE FOR ANY CITATION(S) AND/OR FINE(S) LEVIED FOR IMPROPER REMOVAL, TRANSFER, OR DISPOSAL OF CEMENT–ASBESTOS MATERIAL. SPECIFIC REQUIREMENTS FOR HANDLING AND DISPOSAL OF CEMENT–ASBESTOS MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR FROM THE AGENCY WHICH HAS JURISDICTION OVER REMOVAL, TRANSFER, OR DISPOSAL OF CEMENT–ASBESTOS MATERIAL.

36. WATER SERVICE MAINTENANCE:

THE CONTRACTOR IS TO MAINTAIN WATER SERVICE TO EXISTING SERVICE CONNECTIONS DURING ALL CONSTRUCTION ACTIVITIES WITHIN PROJECT AREA. ALL EXISTING METERS AND SERVICE LINES FOUND IN CONFLICT WITH NEW WATER MAIN ALIGNMENTS, WHETHER OR NOT SHOWN ON PLANS, ARE TO BE SUPPORTED ACROSS THE TRENCH BY THE CONTRACTOR. EXISTING WATER METERS SHALL REMAIN IN PLACE AND ARE NOT TO BE DISTURBED AND/OR RELOCATED BY THE CONTRACTOR DURING WATER MAIN TRENCHING AND INSTALLATION OPERATIONS. WATER METERS MUST REMAIN ACCESSIBLE FOR READING OR MAINTENANCE DURING CONSTRUCTION.

THE CONTRACTOR SHALL PROVIDE MDWID WITH A WRITTEN SCHEDULE OF ALL PLANNED INTERRUPTIONS IN SERVICE A MINIMUM OF 48 HOURS PRIOR TO SAID INTERRUPTION. CONTRACTOR SHALL NOTIFY ALL AFFECTED WATER USERS IN WRITING A MINIMUM OF 24 HOURS PRIOR TO PLANNED INTERUPPTION UNLESS OTHERWISE SPECIFIED BY MDWID.

THE CONTRACTOR SHALL BE HELD LIABLE FOR ANY DAMAGES TO EXISTING WATER FACILITIES THAT OCCUR DURING TRENCHING AND WATER MAIN INSTALLATION OPERATIONS. THE CONTRACTOR SHALL GIVE PROMPT NOTIFICATION TO MDWID WHEN SAID DAMAGES OCCUR.

37. DAMAGE TO EXISTING UTILITIES:

UTILITY LOCATIONS ARE SHOWN ON THE PLANS FOR DESIGN PURPOSES ONLY, IN GENERAL, THE LOCATIONS OF EXISTING MAJOR UTILITIES, ABOVE GROUND AND UNDER GROUND, ARE INDICATED ON THE DRAWING.

THIS INFORMATION HAS BEEN OBTAINED FROM UTILITY MAPS, FIELD SURVEY WORK, AND FROM DESCRIPTIONS PROVIDED BY THE VARIOUS AGENCIES INVOLVED AND REPRESENTS THE BEST INFORMATION AVAILABLE. MDWID DOES NOT GUARTANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION AND IT IS TO BE UNDERSTOOD THAT OTHER FACILITIES NOT SHOWN ON THE DRAWINGS MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK.

UNDER STATE LAW (ARS 40–360–21) THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITIES IN ORDER TO DETERMINE THE LOCATION OF THEIR RESPECTIVE UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO EXISTING UTILITIES. ANY NECESSARY REPAIRS SHALL BE AT CONTRATOR'S EXPENSE.

38. OBSTRUCTIONS:

ANY OBSTRUCTIONS INCLUDING, BUT NOT LIMITED TO, SURVEY STAKES, MAIL BOXES, GRAVEL, ROCKS, TREES, SHRUBBERRY, CACTI, LAWN, LANDSCAPED OR OPEN AREAS, FENCES, EMBANKMENTS, CURBS, GUTTERS, UNPAVED STREETS, ALLEYS, DRIVEWAYS, SIDEWALKS, DRAIN SPOUTS, PIPE LINES, SPRINKLER SYSTEMS, STORM DRAINS, SEWERS, HOUSE CONNECTION SEWERS, CONDUIT, UTILITY POLES, TRAFFIC SIGNS, OR CONTROLS, ETC., ARE TO BE SUPPORTED OR PROTECTED FROM INJURY BY THE CONTRACTOR DURING CONSTRUCTION AND UNTIL COMPLETION

OF THE WORK.

WHERE SHRUBBERY, CACTI, AND LAWNS ARE REMOVED OR DAMAGED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPLACE THEM, USING ACCEPTABLE NURSERY METHODS AT THE CONTRACTOR'S SOLE EXPENSE.

THE CONTRACTOR IS LIABLE AND RESPONSIBLE FOR THE REPAIR AND/OR REPLACEMENT OF ANY DAMAGED OBSTRUCTIONS. DAMAGED OBSTRUCTIONS SHALL BE REPAIRED AND/OR REPLACED USING COMPARABLE MATERIALS AND RESTORED TO EQUAL OR BETTER THAN THE ORIGINAL CONDITIONS AT THE CONTRACTOR'S SOLE EXPENSE, AS DIRECTED BY THE DISTRICT ENGINEER.

METRO WATER DISTRICT

GENERAL CONSTRUCTION NOTES

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

S.D.# MW-105

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MDWID LAYOUT/CUT SHEET

SHEET____ OF____

PROJECT NAME: _____ DATE: _____

MDWID PLAN No.:_____ MIN. COVER REQUIRED: _____

STREET LOCATION: _____

ENGINEERING FIRM:_____

NOTE ANY SPECIAL CONDITIONS: _____

_____

_____

I HEREBY CERTIFY THAT THESE ARE THE EXISTING GRADES AS OF THE DATE OF SURVEY AND THAT THE GIVEN CUTS WILL PROVIDE THE MINIMUM REQUIRED COVER.

SEAL OF REGISTRANT

STA.	DESCRIPTION	F.G. AT C.L.	EXISTING GRADE AT C.L.	C/F TO F.G.	INV. ELEV.	HUB ELEV.	C/F TO INV.	OFF SET

METRO WATER DISTRICT

GENERAL CONSTRUCTION NOTES

ISSUED: 01/99 SCALE: N.T.S.

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MDWID PLAN No.:_____ SHEET____ OF____

PROJECT NAME: _____ DATE: _____

STA.	DESCRIPTION	F.G. AT C.L.	EXISTING GRADE AT C.L.	C/F TO F.G.	INV. ELEV.	HUB ELEV.	C/F TO INV.	OFF SET

I HEREBY CERTIFY THAT THESE ARE THE EXISTING GRADES AS OF THE DATE OF SURVEY AND THAT THE GIVEN CUTS WILL PROVIDE THE MINIMUM REQUIRED COVER.

SEAL OF REGISTRANT

METRO WATER DISTRICT

GENERAL CONSTRUCTION NOTES

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MODIFICATIONS TO THE EXISTING MDWID SYSTEM SHALL NOT BE PERMITTED ON ANY WEEKDAY PRIOR TO 9:00AM OR AFTER 12:00PM. MODIFICATIONS TO THE EXISTING WATER SYSTEM SHALL NOT BE PERMITTED ON ANY SATURDAY, SUNDAY, OR GOVERNMENT HOLIDAY. A TAP OR CONNECTION TO THE EXISTING SYSTEM WITHOUT PRIOR NOTICE TO MDWID MAY RESULT IN A FINE BEING LEVIED AGAINST THE CONTRACTOR.

THE CONTRACTOR IS REQUIRED TO COORDINATE ALL REQUESTS FOR VALVE CLOSURE WITH THE MDWID INSPECTOR. THE CONTRACTOR SHALL PROVIDE MDWID WITH A WRITTEN SCHEDULE OF ALL PLANNED INTERRUPTIONS IN SERVICE A MINIMUM OF 48 HOURS PRIOR TO SAID INTERRUPTION. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED WATER USERS IN WRITING A MINIMUM OF 24 HOURS PRIOR TO PLANNED INTERRUPTION UNLESS OTHERWISE SPECIFIED BY MDWID. SAID NOTIFICATION SHALL INCLUDE TIME OF WATER SHUTOFF, DURATION OF OUTAGE, AND CONTRACTOR'S NAME AND PHONE NUMBER THAT MAY BE ACCESSED 24 HOURS A DAY FOR THE PURPOSE OF ADDRESSING INQUIRIES FROM AFFECTED WATER USERS.

THE CONTRACTOR IS REQUIRED TO NOTIFY ALL AFFECTED WATER USERS AS DETERMINED BY MDWID REGARDING POSSIBLE SERVICE INTERRUPTION OR INCONVENIENCE DURING CONSTRUCTION. SAID NOTIFICATION SHALL INCLUDE CONTRACTOR'S NAME AND PHONE NUMBER THAT MAY BE ACCESSED 24 HOURS A DAY FOR THE PURPOSE OF ADDRESSING INQUIRIES FROM AFFECTED WATER USERS.

IN THE EVENT OF DAMAGE TO AN EXISTING WATER MAIN, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY MDWID. MDWID PERSONNEL SHALL OPERATE ALL VALVES NECESSARY TO EFFECT REPAIRS. REPAIRS TO EXISTING WATER MAINS SHALL BE PERFORMED BY MDWID PERSONNEL UNLESS OTHERWISE AUTHORIZED. WHEN AUTHORIZED BY MDWID, EMERGENCY REPAIRS MADE BY THE CONTRACTOR SHALL BE PERFORMED UNDER THE SUPERVISION OF MDWID AND SHALL CONTINUE NON-STOP UNTIL WATER SERVICE IS RESTORED. IF THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO EXISTING WATER MAINS, REPAIRS SHALL BE AT THE CONTRACTOR'S SOLE EXPENSE.

METRO WATER DISTRICT

CUSTOMER NOTIFICATION

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

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S.D.# MW-110

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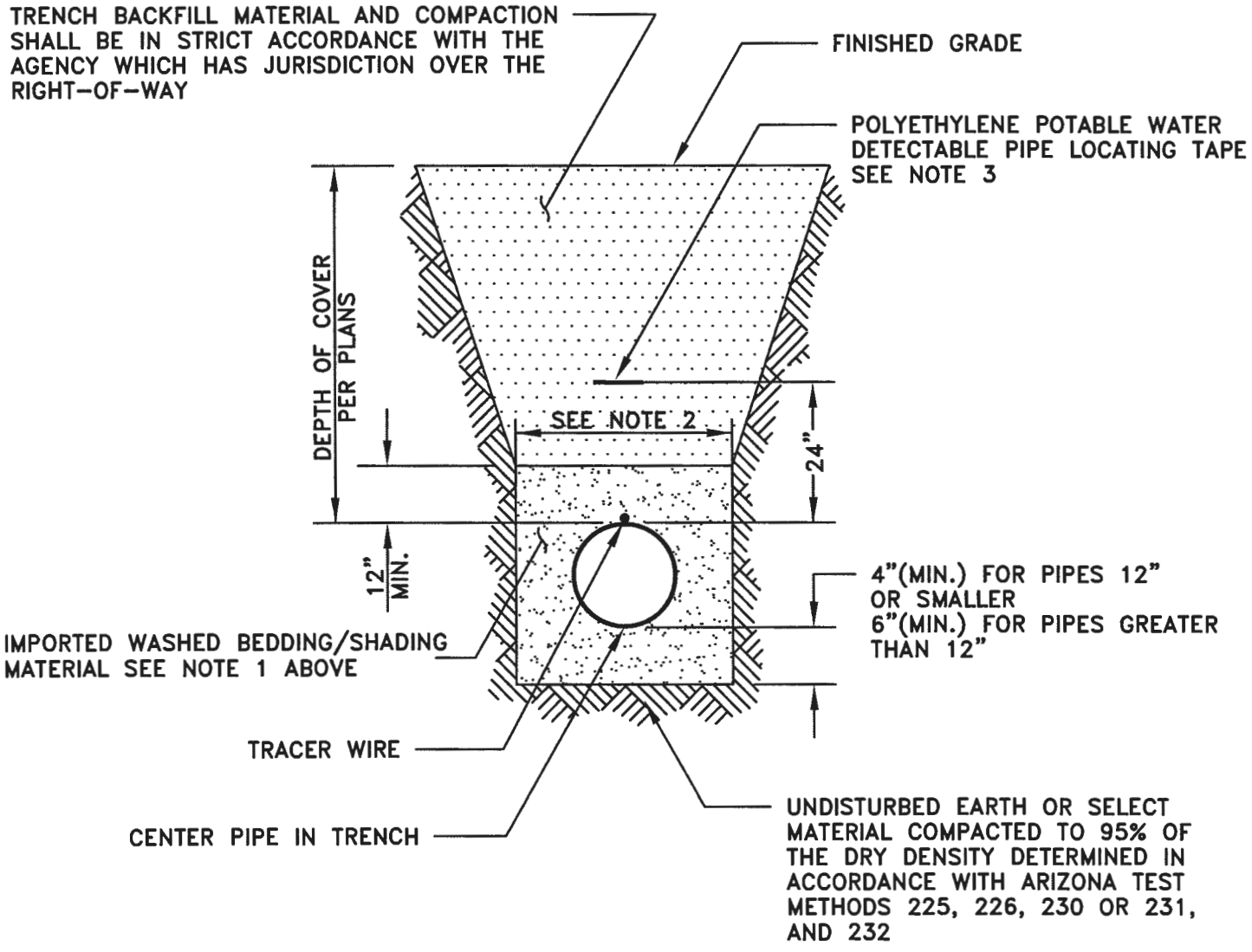
NOTES:

1. IMPORTED WASHED SAND BEDDING/SHADING MATERIAL SHALL BE REQUIRED AND SHALL MEET THE GRADATION AND PLASTICITY INDEX / LIQUID LIMIT REQUIREMENTS NOTED IN MDWID SUPPLEMENTAL SPECIFICATION 0209.310. THE SAND BEDDING/SHADING MATERIAL SHALL BE PLACED IN ACCORDANCE WITH MDWID SUPPLEMENTAL SPECIFICATION 0209.0310 SUBSECTION (A).
2. TRENCH WIDTH SHALL BE PER PIPE MANUFACTURER'S SPECIFICATIONS.
3. FOR PLACEMENT OF POLYETHYLENE POTABLE WATER DETECTABLE PIPE LOCATING TAPE AND TRACER WIRE, SEE MDWID STANDARD DETAIL MW-116.



METRO WATER DISTRICT

PIPE BEDDING & TRENCH BACKFILL

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 07/2014

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S.D.# MW-115

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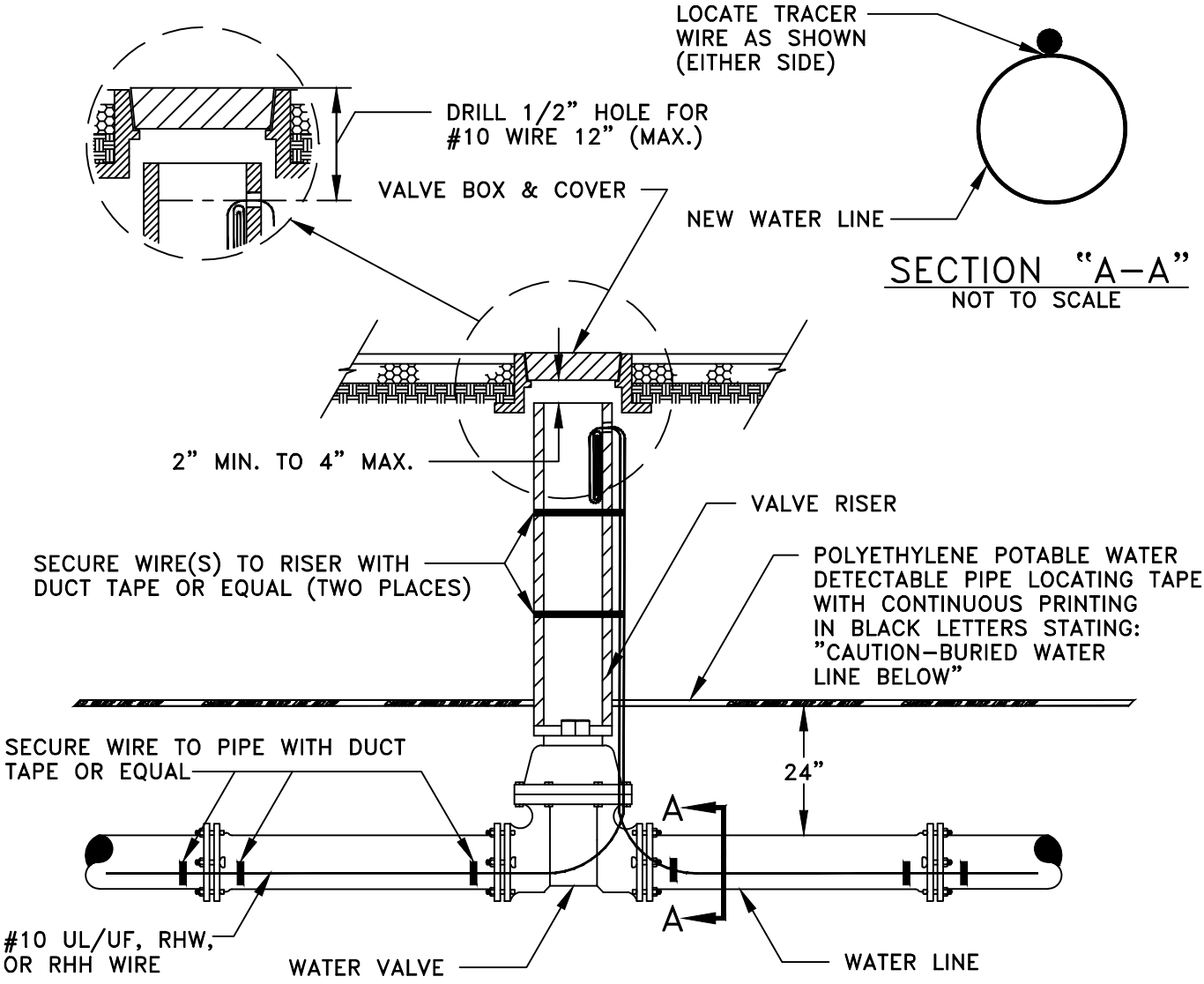

NOTES:

1. THE CONTRACTOR IS REQUIRED TO INSTALL ONE CONTINUOUS #10 AWG SOLID COPPER UL/UF, RHW, OR RHH WIRE ALONG THE PIPE AND OUTSIDE THE VALVE RISER. SECURE WIRE(S) TO THE RISER AND PIPE PER THIS DETAIL.

2. THREAD #10 WIRE(S) THROUGH 1/2" HOLE. CONTRACTOR SHALL LEAVE A MINIMUM OF THREE FEET (3') OF NEW WIRE INSIDE OF RISER. EXCESS WIRE SHALL BE LEFT NEATLY AGAINST INSIDE OF RISER.

3. WHERE A SPLICE IS NECESSARY, USE UNDERGROUND SPLICE KIT OF #10 SILICONE–FILLED WIRE NUT.

4. MATERIAL FOR VALVE RISER SHALL BE PVC C–900 AND SHALL BE OF CONTINUOUS LENGTH TO THE BOTTOM OF THE VALVE BOX.

METRO WATER DISTRICT

TRACER WIRE & POLYETHYLENE WARNING TAPE

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 06/2016

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S.D.# MW-116

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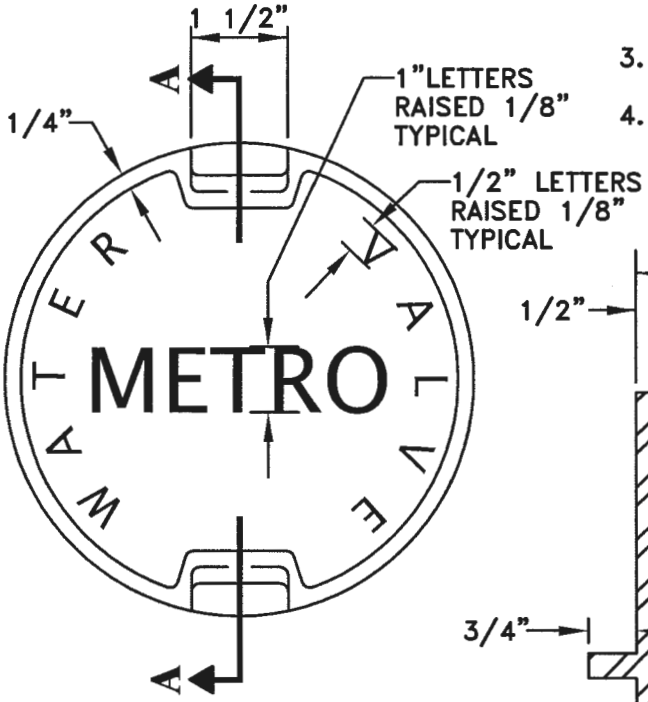
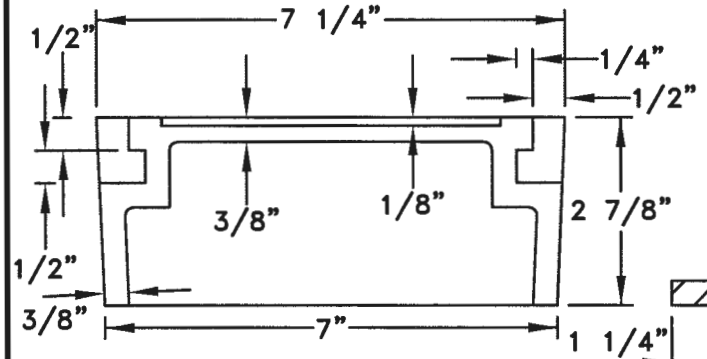
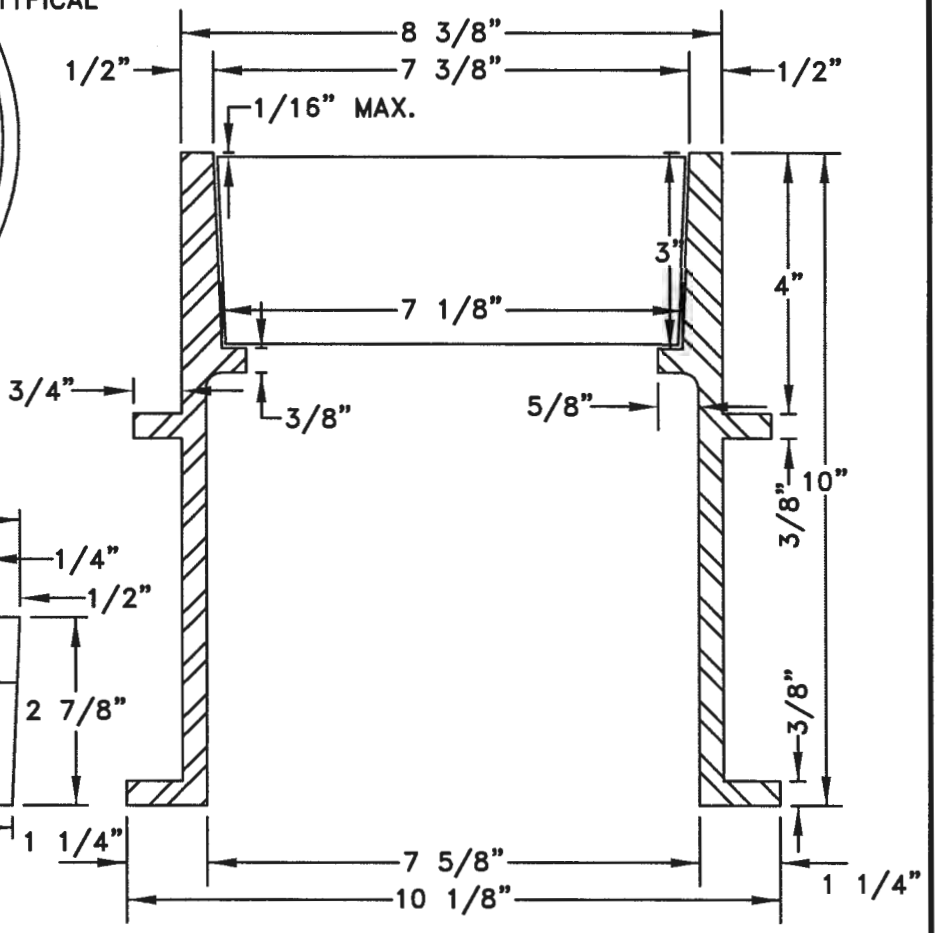
NOTES:

1. ALL MATERIAL SHALL BE CAST IRON PER ASTM A-48, CLASS 30 B.
2. THE SURFACES OF THE LID AND BOX THAT COME IN CONTACT WITH EACH OTHER MUST BE SMOOTH AND FREE OF ALL CASTING RIDGES AND BURRS TO PROVIDE A SNUG FIT.
3. BOX AND LID WEIGHT – 50 LBS. ± 5 LBS.
4. THE VALVE LID MUST BE ABLE TO ROTATE 360° IN THE BOX CASTING WITHOUT BINDING.





SECTION A-A
LID & PICK HOLE



SECTION A-A
BOX

NOTE: THIS DETAIL REPLACES TUCSON WATER SD-300, SHEET 3 OF 3 ONLY.

METRO WATER DISTRICT

WATER VALVE BOX & COVER

ISSUED: 01/99 SCALE: N.T.S.
REVISED: _____

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S.D.# MW-300

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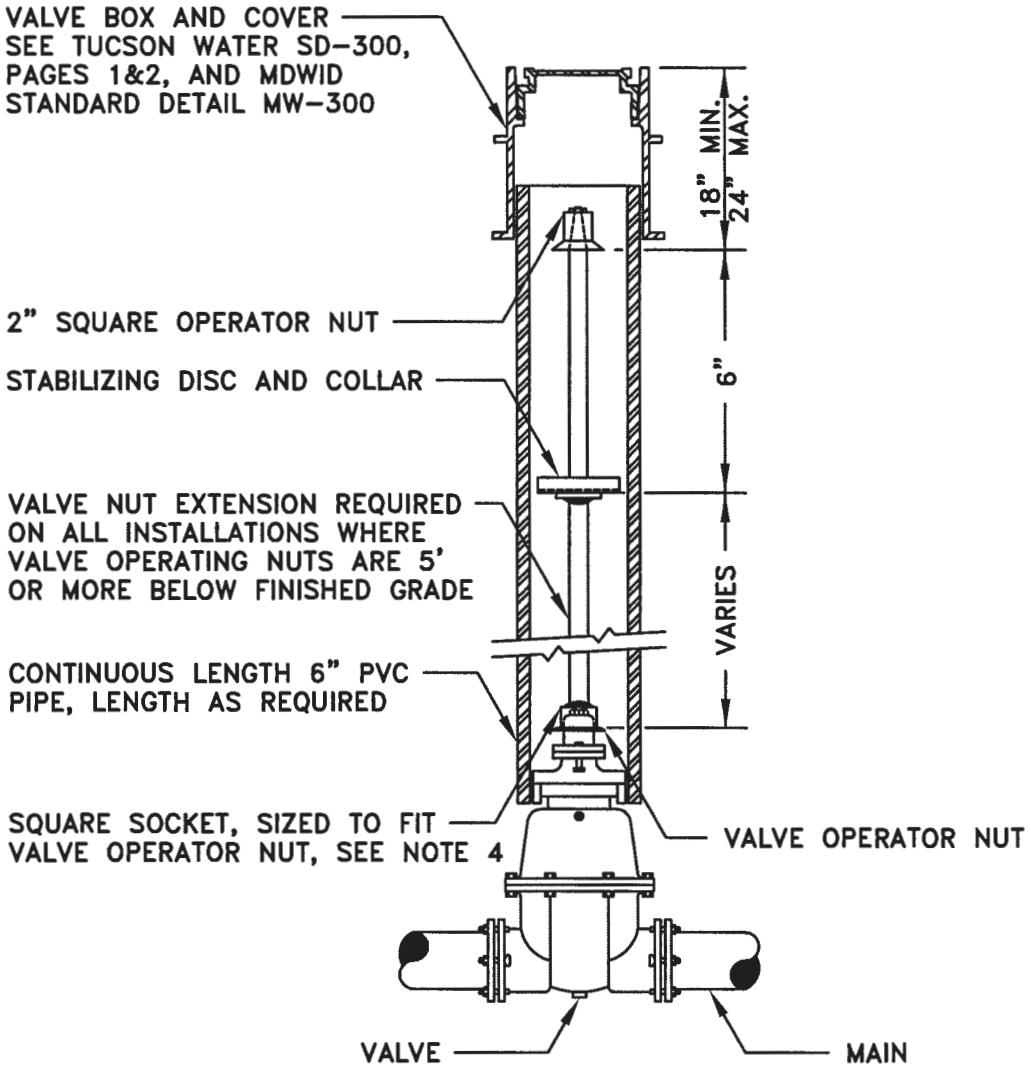

NOTES:

1. OPERATOR NUT, VALVE NUT EXTENSION, DISC & COLLAR & SQUARE SOCKET SHALL ALL BE CENTERED VERTICALLY OVER VALVE OPERATOR NUT.
2. VALVE NUT EXTENSIONS TO BE SUPPLIED BY THE CONTRACTOR.
3. THIS DETAIL REPLACES TUCSON WATER SD-305, SHEET 1 OF 2 ONLY.
4. VALVE NUT EXTENSION SHALL NOT BE PERMANENTLY ATTACHED TO VALVE NUT.

METRO WATER DISTRICT

VALVE NUT EXTENSION

ISSUED: 01/99 SCALE: N.T.S.

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S.D.# MW-305

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NOTES:

1. THIS DETAIL REPLACES TUCSON WATER STANDARD DETAIL SD-309 PAGES 1 THROUGH 12 AND 14 ONLY.

2. ALL SERVICE LINES FOR 5/8", 3/4", AND 1" METERS SHALL BE 1". 1½" METERS SHALL BE 1½". 2" METERS SHALL BE 2".

3. ANGLE METER STOP SHALL BE MARKED WITH A 3' PIECE OF #9 GALVANIZED WIRE TIED TO THE LOCKING TAB. UPON INSTALLATION OF THE METER BOX, WIRE SHALL BE COILED INSIDE METER BOX.

4. METER BOXES SHALL BE PROVIDED BY THE OWNER/DEVELOPER, UNLESS NOTED OTHERWISE ON PROJECT SPECIFIC DOCUMENTS, AND INSTALLED BY THE CONTRACTOR PRIOR TO THE INSTALLATION OF WATER METERS. METER BOXES ARE TO BE SET ON TWO (2) SOLID CONCRETE BLOCKS 2"x4"x8" IN NATURAL GROUND OR FOUR (4) CONCRETE BLOCKS IN CONCRETE AND PAVEMENT.

5. PLASTIC METER BOXES SHALL BE A 5/8" & 3/4" METER BOX FOR 5/8" AND 3/4" METERS, A 1" METER BOX FOR 3/4" OR 1" METERS, AND A 1½" & 2" METER BOX FOR 1½" & 2" METERS. CAST IRON METER BOXES SHALL CONFORM TO MARICOPA ASSOCIATION OF GOVERNMENTS STANDARD DETAIL 320 DIMENSIONS AND SHALL BE A #2 FOR 5/8" & 3/4" METERS, #3 FOR 1" & 1½" METERS AND #4 FOR 2" METERS.

6. ALL CAST IRON METER BOXES SHALL BE FURNISHED WITH A METAL LID WITH A 2" PRE-DRILLED HOLE OR CONTRACTOR DRILLED HOLE AND HOLE COVER PLACED OVER THE OPENING.

7. METER BOXES SHALL NOT BE INSTALLED IN TRAVELED AREAS, DRIVEWAYS, OR PEDESTRIAN WALKWAYS. WHERE IT IS NOT POSSIBLE TO AVOID PLACEMENT IN THESE AREAS, A TRAFFIC RATED CAST IRON OR POLYMER METER BOX WITH LOCK DOWN LID WILL BE USED PENDING PRIOR APPROVAL BY MDWID.

8. LOCATION OF METERS WITHIN PARKING SPACES, PARKING AREA ACCESS LANES (P.A.A.L) AND SIDEWALKS SHALL BE AVOIDED WHEREVER POSSIBLE. WHERE IT IS NOT POSSIBLE TO MEET THIS CRITERIA, A TRAFFIC RATED CAST IRON, OR PLASTIC METER BOX WITH LOCK DOWN LID SHALL BE USED.

9. TOP OF METER BOX TO BE SET ½"-1" ABOVE FINISHED GRADE, EXCEPT IN CONCRETE OR PAVEMENT, WHERE TOP OF BOX SHALL BE FLUSH WITH FINISHED GRADE. METER BOXES SET IN CONCRETE SHALL HAVE A ½" MASTIC JOINT MATERIAL INSTALLED BETWEEN THE BOX AND THE CONCRETE.

10. METERS SHALL NOT BE PLACED IN CURBWAY, DEDICATED DRAINAGEWAYS, OR DRAINAGE EASEMENTS.

11. MAINTAIN 18" FROM BACK OF SIDEWALK, WHERE ONE EXISTS. METER BOX SHALL BE PARALLEL TO CURB OR SIDEWALK.

12. BACKFLOW PREVENTION IS REQUIRED ON ALL 1½" AND 2" METERS. BACKFLOW PREVENTION ALSO REQUIRED ON ALL NON-RESIDENTIAL METERS (OF ANY SIZE) AND FOR ALL RESIDENCES WITH ACTIVE PRIVATE WELLS. THE INSTALLATION OF A BACKFLOW PREVENTION ASSEMBLY, CHECK VALVE, OR PRV MAY CREATE A CLOSED SYSTEM. CONSULT LOCAL PLUMBING CODES FOR PRESSURE RELIEF VALVE AND THERMAL EXPANSION REQUIREMENTS.

METRO WATER DISTRICT

WATER SERVICE CONNECTION NOTES

ISSUED: 07/2014 SCALE: N.T.S.

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13. SERVICE SADDLE SHALL BE BRONZE SADDLE WITH BRONZE DOUBLE STRAPS OR EPOXY COATED D.I. SADDLE WITH STAINLESS STEEL STRAPS ACCORDING TO MDWID STANDARD SPECIFICATION 1416.

14. PEX PIPE UTILIZED AS PRIVATE SIDE YARD PLUMBING SHALL BE DEMONSTRATED TO THE INSPECTOR TO HAVE THE MANUFACTURERS REQUIRED EXPANSION OFFSETS IN CLOSE PROXIMITY TO THE WATER METER LOCATION.

15. SERVICE TAPS MADE INTO MAINS SHALL BE 30" MINIMUM FROM ANY CONNECTION OR FITTING.

16. MULTIPLE TAPS MADE ON A SINGLE SECTION OF PIPE SHALL BE PLACED SO THAT ADJACENT TAPS ARE NOT ON THE SAME AXIS. TAPS SHALL VARY BY 5 DEGREES MINIMUM.

17. BEDDING AND BACKFILL FOR SERVICE LINES TO MEET SAME CRITERIA AS BACKFILL METHODS FOR MAIN LINES, SEE MDWID STANDARD DETAIL MW-115. TRACER WIRE IS NOT REQUIRED WITH COPPER PIPE.

18. ANGLE METER STOPS SHALL NOT BE INSTALLED AT THE SAME LOT CORNER AS THE ELECTRIC SERVICE OR TRANSFORMER. WHERE THIS CANNOT BE ACCOMPLISHED, THE WATER SERVICE AND THE ELECTRICAL SERVICE OR TRANSFORMER MUST HAVE A MINIMUM HORIZONTAL SEPARATION OF 10'-0".

19.

SERVICE LINE DIAMETERS BY LENGTH OF SERVICE LINE*

	<40'	40'-100'	>100'
1.0"	1.0"	1.5"	1.5"
1.5"	1.5"	2.0"	2.0"
2"	2.0"	2.0"	4" MAIN WITH MDWID APPROVAL

* ONLY REQUIRE UPSIZING OF SERVICE LINE DIAMETER IF PEAK DAY + FIRE FLOW PRESSURE IS <45 PSI

20. BORING TO INSTALL SERVICE LINE WILL BE PERMITTED ONLY IF SHOWN ON THE APPROVED PLANS OR WITH APPROVAL OF THE DISTRICT ENGINEER.

21. BORE AND RECEIVING PITS SHALL NOT ENCROACH UPON PRIVATE PROPERTY. ANY LANDSCAPING OR IMPROVEMENTS DAMAGED OR MOVED WILL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE DISTRICT ENGINEER AND PROPERTY OWNER.

22. ONLY MACHINES MANUFACTURED FOR BORING WILL BE USED.

23. DEVIATION FROM A STRAIGHT AND LEVEL BORE MUST FALL WITHIN THE FOLLOWING PARAMETERS TO BE ACCEPTED.
HORIZONTAL: +/- 12 INCHES
VERTICAL: +/- 6 INCHES

METRO WATER DISTRICT

WATER SERVICE CONNECTION NOTES

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24. ALL BORES SHALL BEGIN AT A MINIMUM ELEVATION OF 36" BELOW FINISHED GRADE OR AS SHOWN ON THE PLANS, AND AS CLOSE TO THE STATION SHOWN ON THE PLANS AS POSSIBLE. IF NO STATION IS SHOWN FOR AN EXISTING SERVICE TO BE REPLACE, THEN THE BORE SHALL BE AS CLOSE TO PERPENDICULAR AS POSSIBLE.

METRO WATER DISTRICT

WATER SERVICE CONNECTION NOTES

ISSUED: 07/2014 SCALE: N.T.S.
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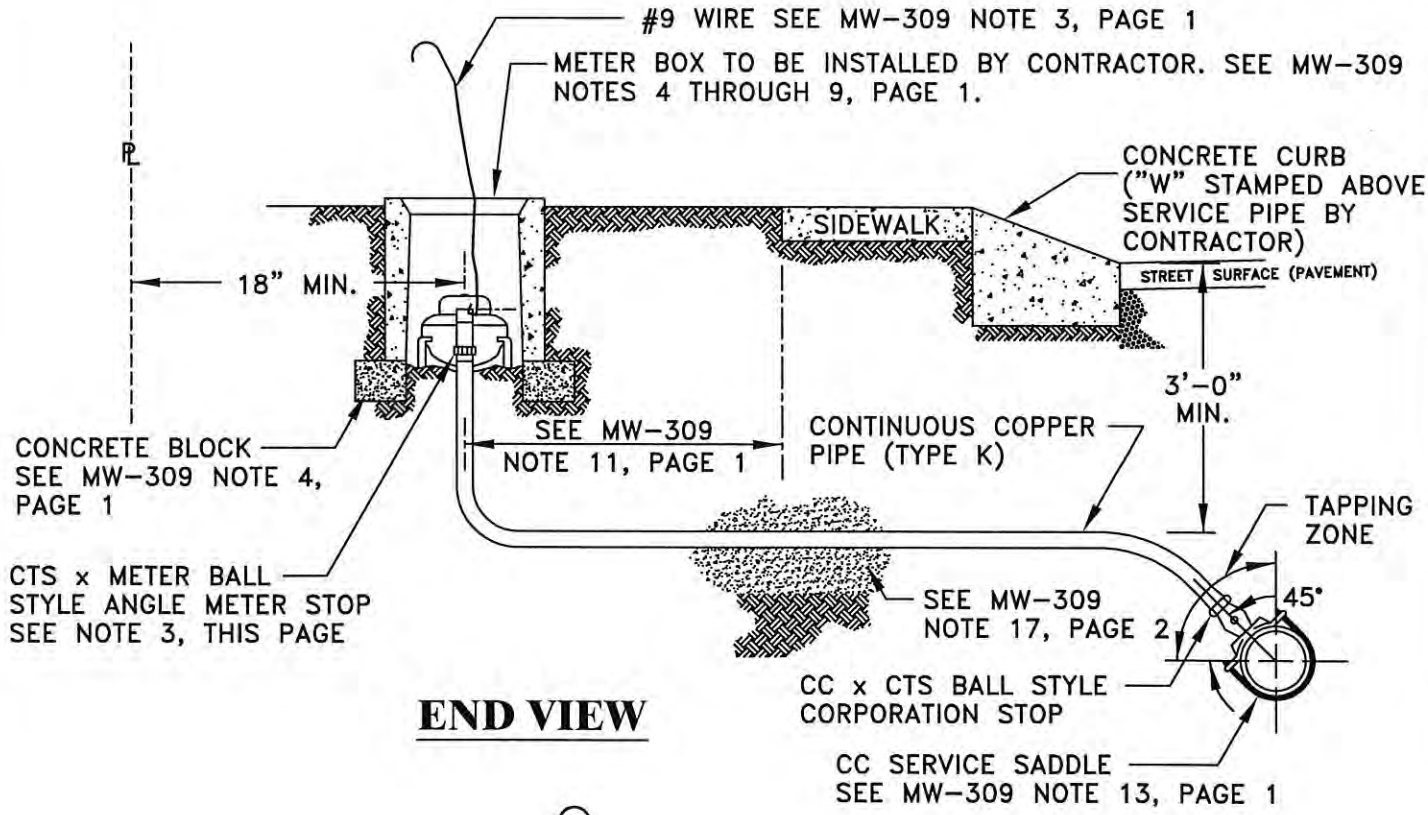

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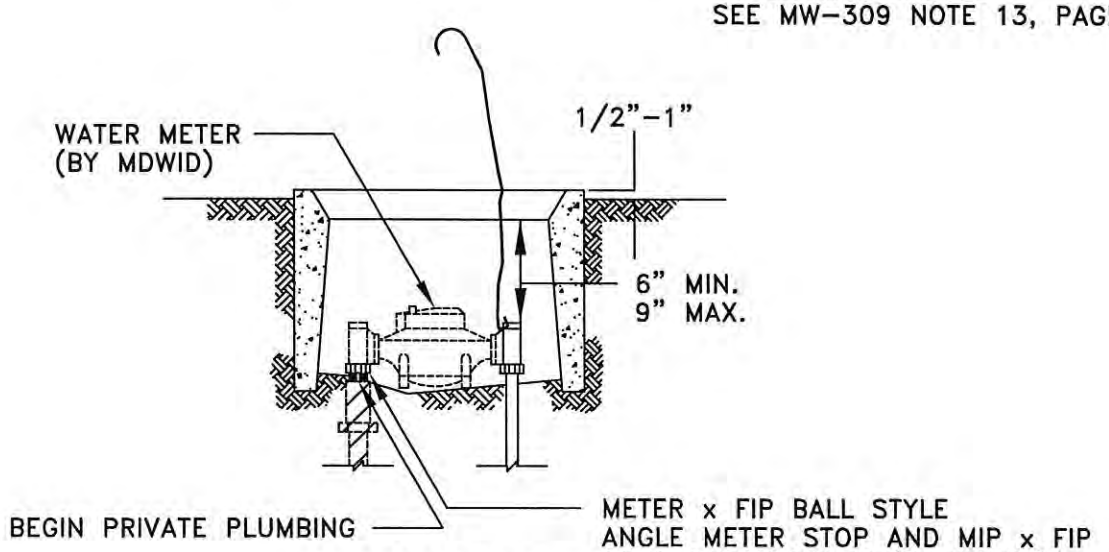

SIDE VIEW

NOTE:

1. PLACEMENT SHOWN REPRESENTS PLACEMENT BEHIND SIDEWALK. FOR PLACEMENT IN MEDIAN OR LANDSCAPE ISLAND, SEE MW-309, PAGE 8.
2. FOR TOP VIEW SEE MW-309, PAGE 5.
3. ANGLE METER STOP SIZE SHALL BE BASED ON METER SIZE.

METRO WATER DISTRICT

WATER SERVICE CONNECTIONS (1 INCH SINGLE WATER SERVICE)

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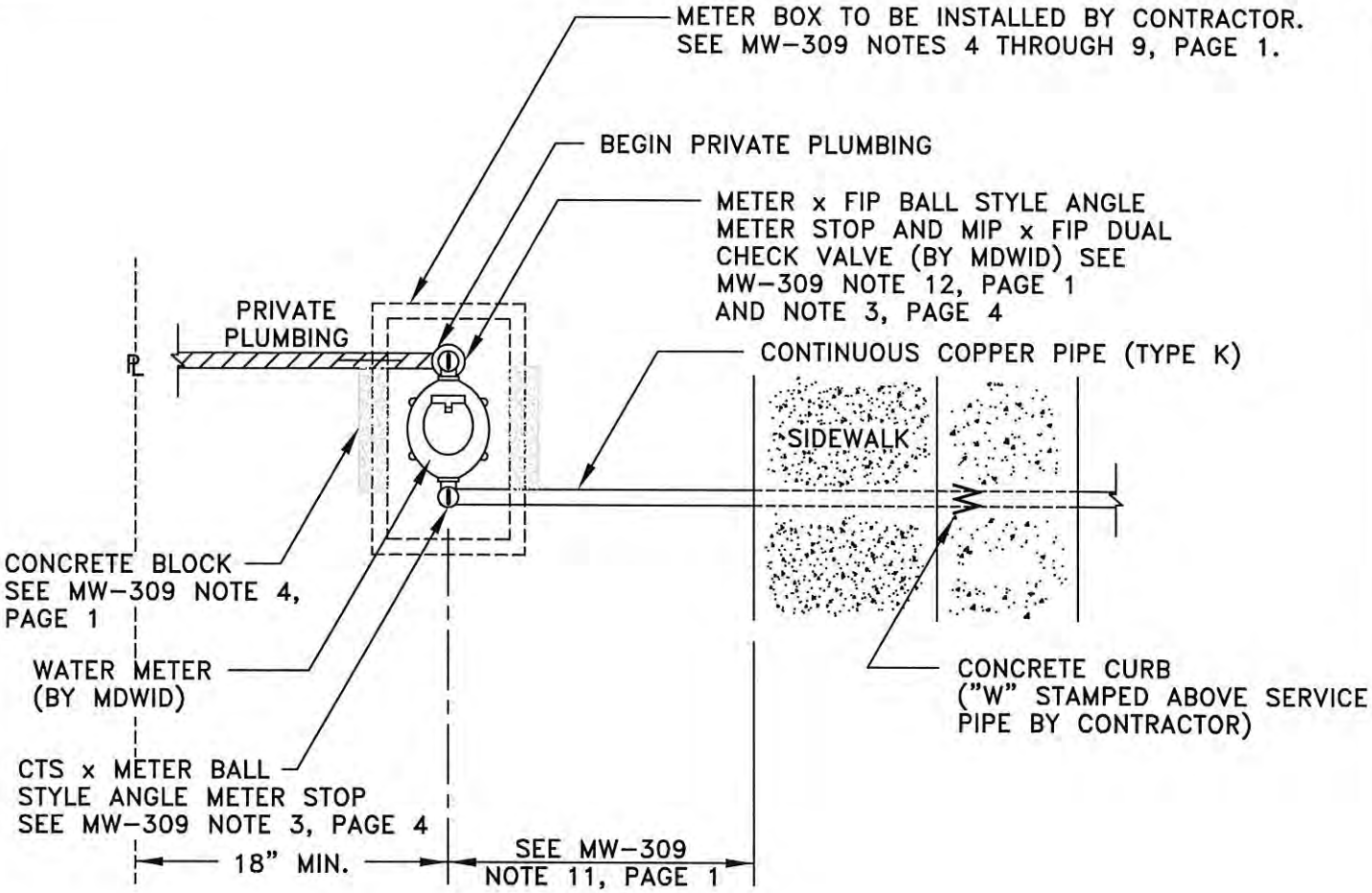

TOP VIEW

NOTE:

1. PLACEMENT SHOWN REPRESENTS PLACEMENT BEHIND SIDEWALK. FOR PLACEMENT IN MEDIAN OR LANDSCAPE ISLAND, SEE MW-309, PAGE 8.
2. FOR END AND SIDE VIEWS SEE MW-309, PAGE 4.

METRO WATER DISTRICT

WATER SERVICE CONNECTIONS (1 INCH SINGLE WATER SERVICE)

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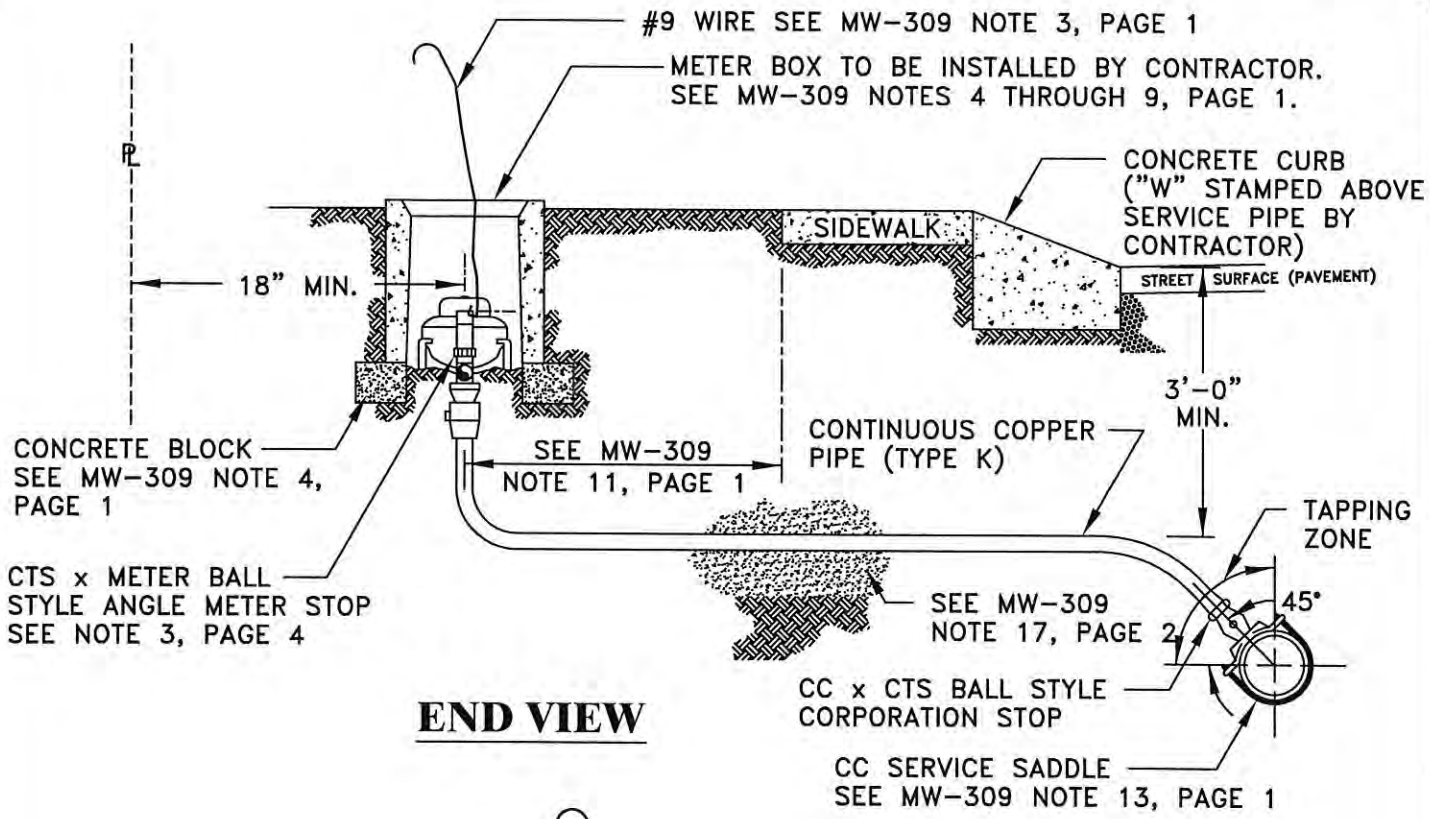
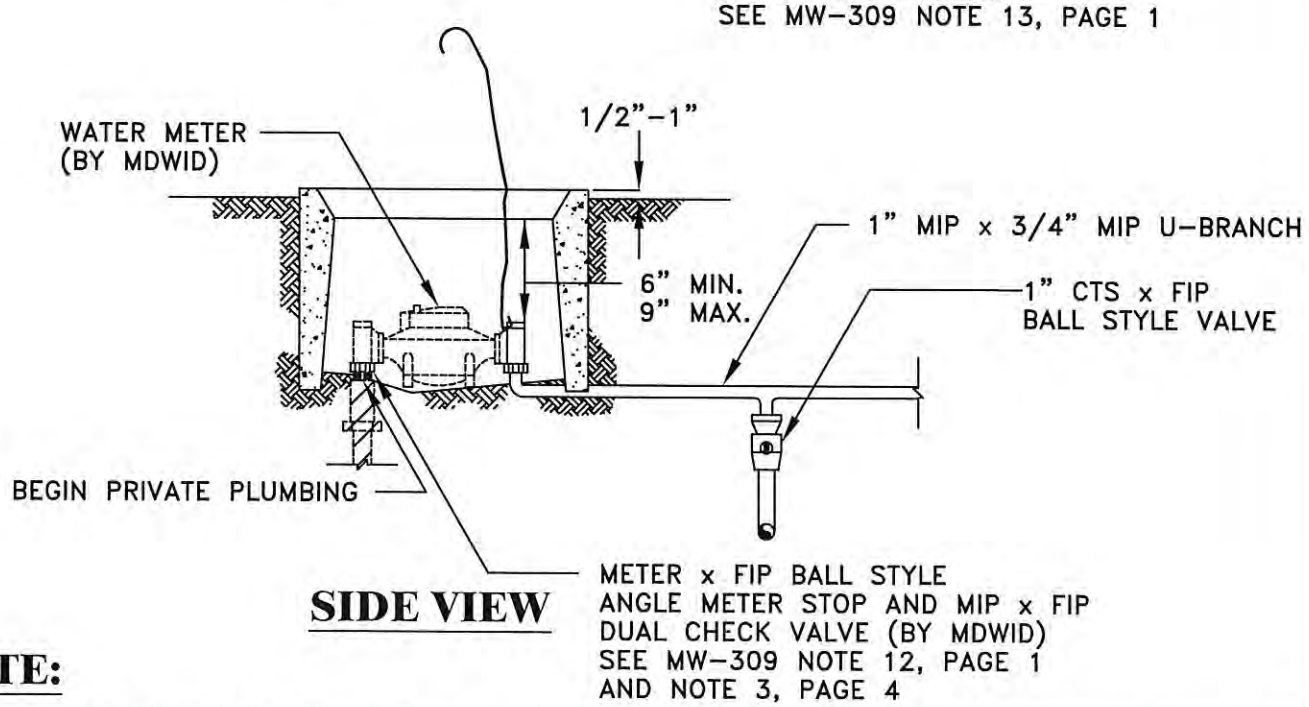


END VIEW



SIDE VIEW

NOTE:

1. PLACEMENT SHOWN REPRESENTS PLACEMENT BEHIND SIDEWALK. FOR PLACEMENT IN MEDIAN OR LANDSCAPE ISLAND, SEE MW-309, PAGE 8.
2. FOR TOP VIEW SEE MW-309, PAGE 7.

METRO WATER DISTRICT

WATER SERVICE CONNECTIONS (1 INCH SPLIT WATER SERVICE)

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

PAGE 6 OF 14

S.D.# MW-309

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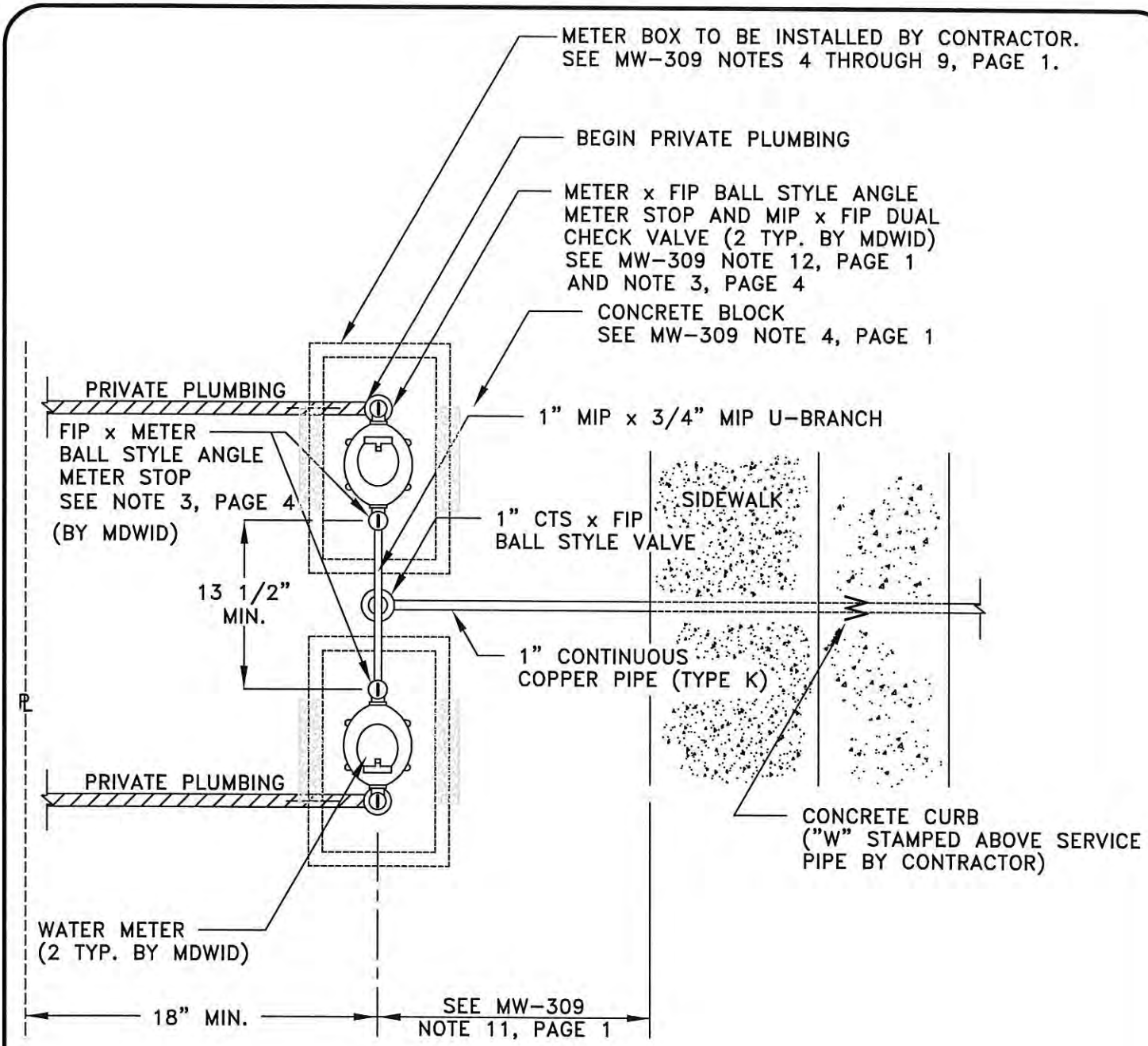

TOP VIEW

NOTE:

1. PLACEMENT SHOWN REPRESENTS PLACEMENT BEHIND SIDEWALK. FOR PLACEMENT IN MEDIAN OR LANDSCAPE ISLAND, SEE MW-309, PAGE 8.
2. FOR END AND SIDE VIEWS SEE MW-309, PAGE 6.

METRO WATER DISTRICT

WATER SERVICE CONNECTIONS (1 INCH SPLIT WATER SERVICE)

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

S.D.# MW-309

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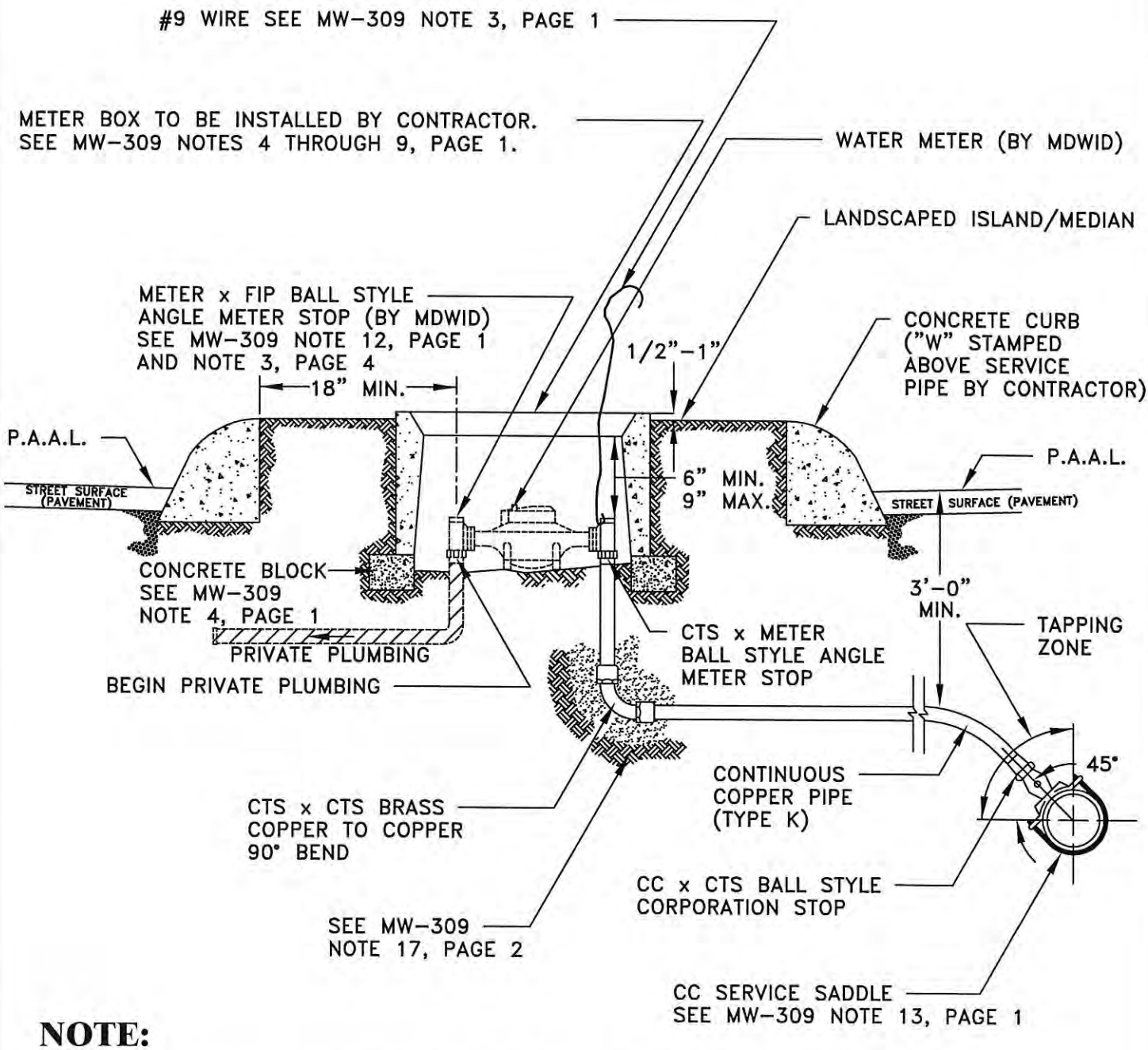

NOTE:

1. PLACEMENT SHOWN REPRESENTS PLACEMENT IN MEDIAN OR LANDSCAPE ISLAND. FOR PLACEMENT BEHIND SIDEWALK, SEE MW-309, PAGE 4.

METRO WATER DISTRICT

WATER SERVICE CONNECTIONS (1-1/2 & 2 INCH SINGLE WATER SERVICE)

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

S.D.# MW-309

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METER BOX NOTES

METRO WATER ACCEPTS WATER METER BOXES THAT CONFORM TO THE ANNUAL REQUIREMENTS CONTRACT FOR WATER METER BOXES FOR THE CITY OF TUCSON.

ALL WATER METER BOXES AND LIDS SHALL COMPLY WITH THE PROVISIONS OF THIS SPECIFICATION.

PLASTIC METER BOX:
THE METER BOX SHALL BE BLACK AND CONSTRUCTED OUT OF A POLYETHYLENE MATERIAL BLEND FOR MAXIMUM DURABILITY AND CORROSION RESISTANCE. THE POLYETHYLENE MATERIAL BLEND SHALL HAVE A TENSILE STRENGTH GREATER THAN 1700 PSI.

1. THE POTABLE WATER METER BOX SHALL BE BLACK IN COLOR (BLENDED AT THE TIME OF MANUFACTURE) FOR MAXIMUM UV PROTECTION.
2. THE RECLAIMED METER BOX SHALL BE PURPLE (PANTONE 512 BLENDED AT THE TIME OF MANUFACTURE).
3. THE METER BOX SHALL HAVE CRUSH RESISTANT RIBBING ALONG THE OUTSIDE OF THE BOX.
4. THE METER BOX SHALL HAVE A FLANGE AROUND THE LID OPENING TO HELP PREVENT SETTLING AND AIDE IN ADJUSTMENT TO GRADE.

PIPE HOLES:
1. THE PIPE HOLES FOR THE STANDARD METER BOX SHALL MEASURE 2–3/4"X3–1/2".
2. THE PIPE HOLES FOR THE SINGLE ¾" PLASTIC METER BOX SHALL MEASURE 3–1/2"X3–1/2".

PLASTIC LID:
THE METER BOX LIDS FOR THE ⅝" & ¾" METER BOX, 1" METER BOX, AND THE 1½" & 2" METER BOX, SHALL BE CONSTRUCTED OUT OF A POLYETHYLENE MATERIAL BLEND FOR MAXIMUM DURABILITY AND CORROSION RESISTANCE. THE POLYETHYLENE MATERIAL BLEND SHALL HAVE A TENSILE STRENGTH GREATER THAN 1700 PSI.

1. THE POTABLE METER BOX LID SHALL BE BLACK (BLENDED AT THE TIME OF MANUFACTURE) AND HAVE "METRO WATER" MOLDED INTO THE LID AS WELL AS THE MANUFACTURER'S NAME OR LOGO. FRONT SHALL BE STANDARD FADAL CNC FONT WITH 1" CHARACTERS X .150 DEEP.
2. THE RECLAIMED METER BOX LID SHALL BE PURPLE (PANTONE 512 BLENDED AT THE TIME OF MANUFACTURE) AND HAVE "METRO RECLAIMED WATER" MOLDED INTO THE LID AS WELL AS THE MANUFACTURER'S NAME OR LOGO. FONT SHALL BE STANDARD FADAL CNC FONT WITH 1" CHARACTERS X .150 DEEP.
3. BOTH, POTABLE AND RECLAIMED METER BOX LIDS SHALL HAVE MOLDED TREAD–PATTERN FOR SKID RESISTANCE; TREAD SHALL BE .188 X .938 X .150 DEEP.
4. BOTH, POTABLE AND RECLAIMED METER BOX LIDS SHALL BE SOLID THROUGH.
5. BOTH LIDS SHALL SEAT SECURELY AND EVENLY INSIDE THE METER BOX AND SHALL NOT OVERLAP THE TOP EDGE OF THE METER BOX.
6. BOTH POTABLE AND RECLAIMED METER BOX LIDS SHALL HAVE A MOLDED LIFTING HOLE FOR USE BY METER READING TOOL. THE MOLDED LIFTING HOLE SHALL CONFORM TO METRO WATER SUPPLEMENTAL DETAIL MW–309, SHEETS TEN (10), ELEVEN (11), AND TWELVE (12).
7. BOTH POTABLE AND RECLAIMED METER BOX LIDS SHALL HAVE A LOCATING MAGNET CAST INTO THE LID.

METRO WATER DISTRICT

METER BOX NOTES

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

S.D.# **MW-309**

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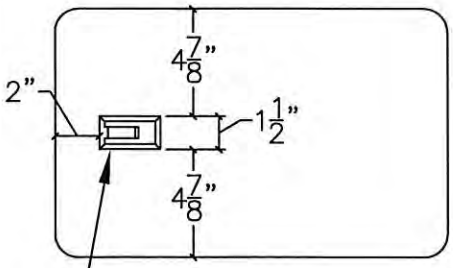

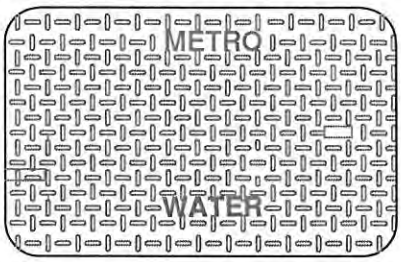

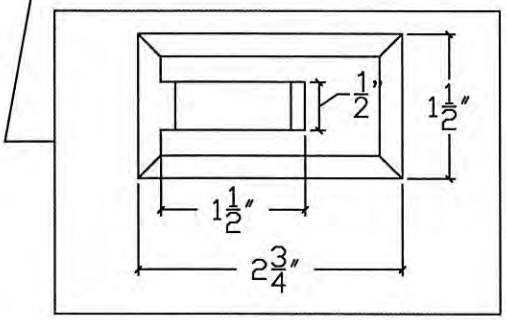

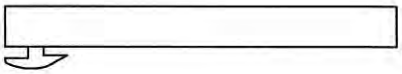

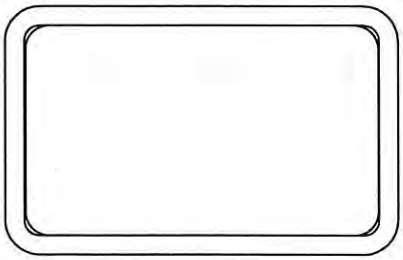

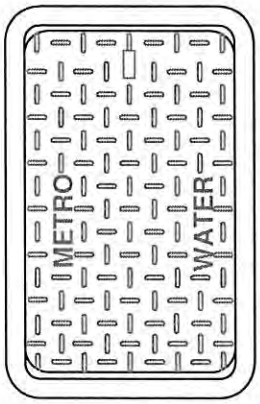

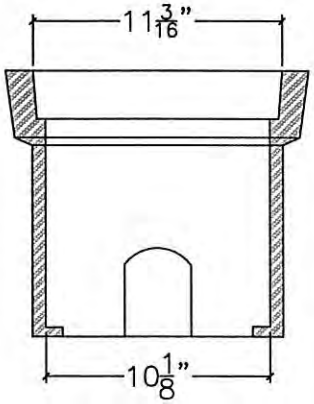

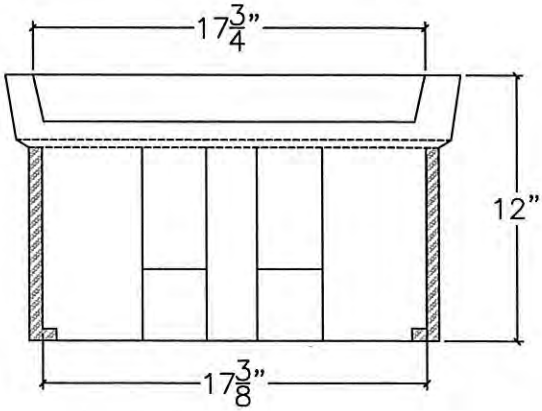

WATER SERVICE CONNECTIONS
5/8" & 3/4" METER BOX

METRO WATER DISTRICT

ISSUED: 07/2014 SCALE: N.T.S.

REVISED: 05/2016

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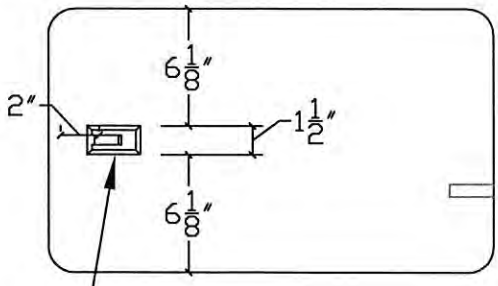

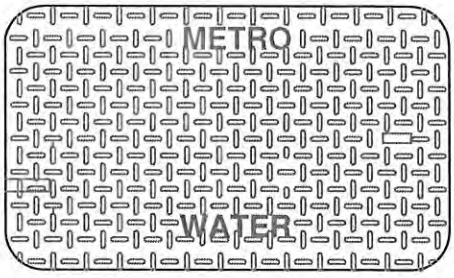

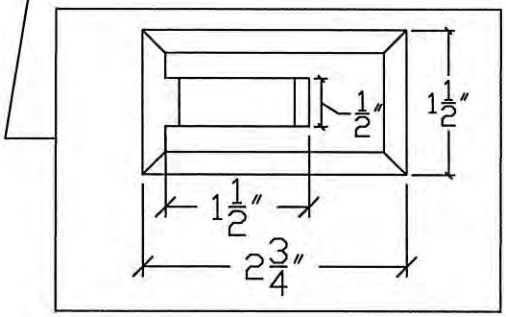

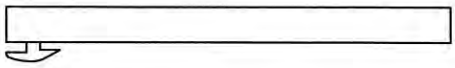

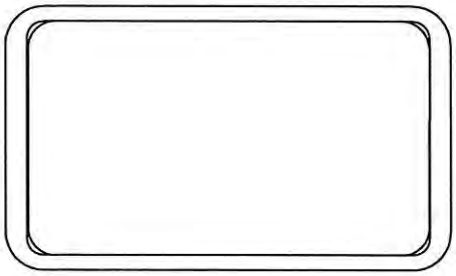

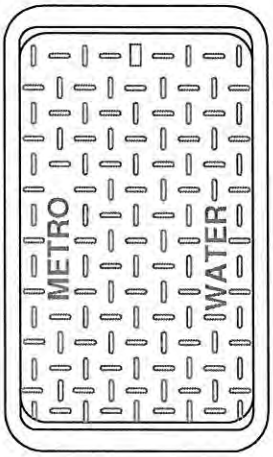

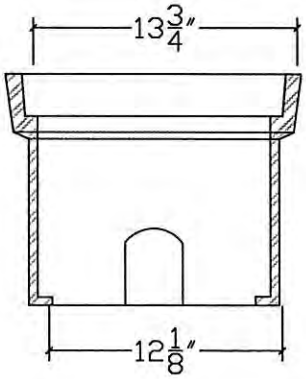

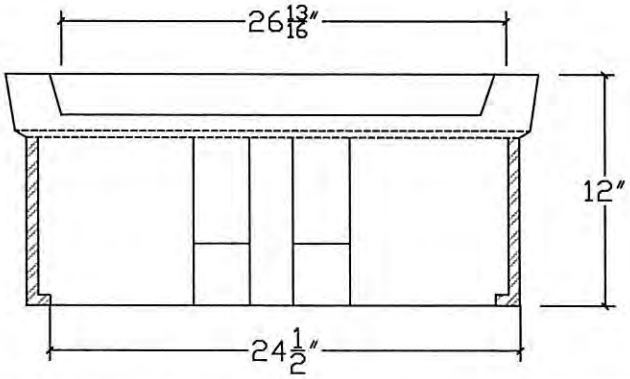

WATER SERVICE CONNECTIONS
1" METER BOX

METRO WATER DISTRICT

ISSUED: 07/2014 SCALE: N.T.S.

REVISED: 05/2016

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S.D.# **MW-309**

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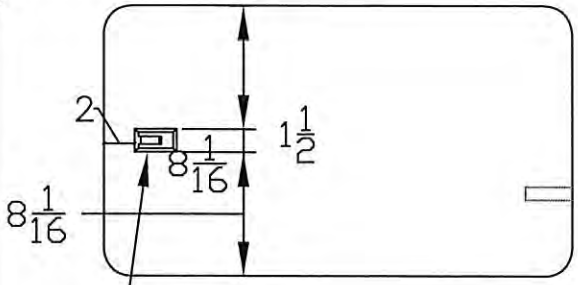

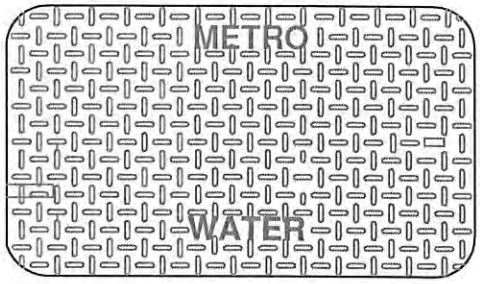

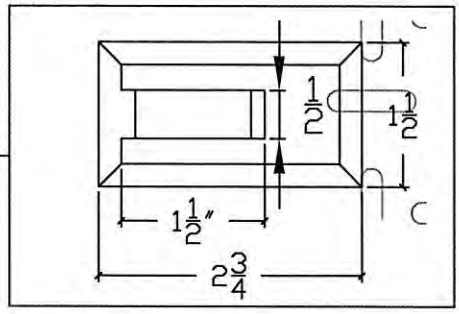

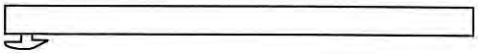

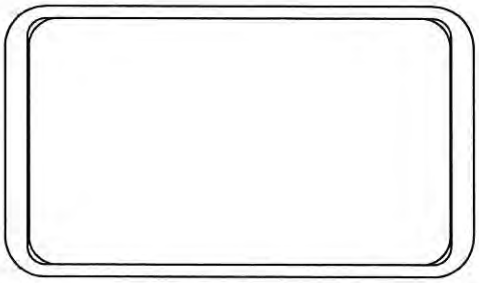

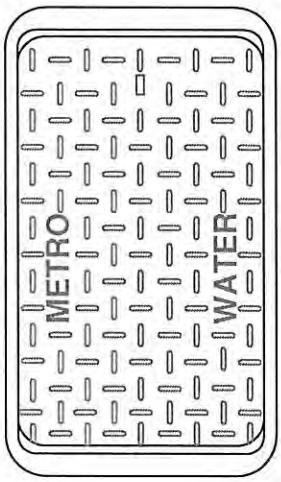

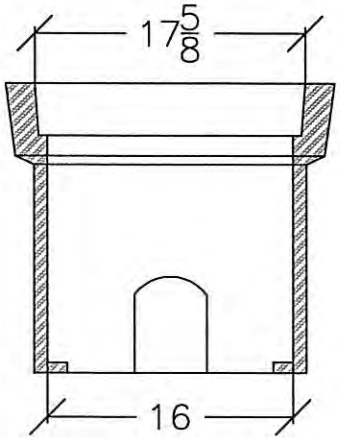

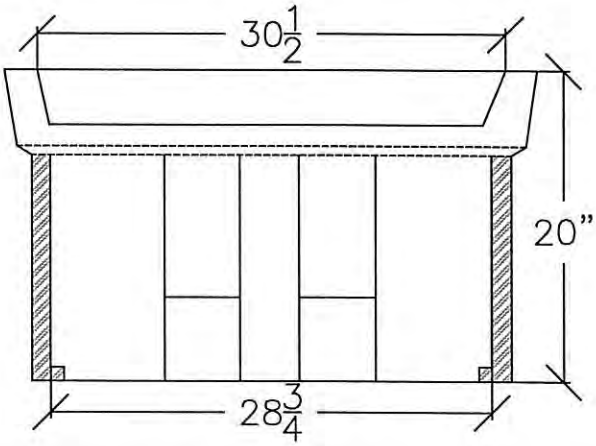

WATER SERVICE CONNECTIONS
1 1/2" & 2" METER BOX

METRO WATER DISTRICT

ISSUED: 07/2014 SCALE: N.T.S.

REVISED: 05/2016

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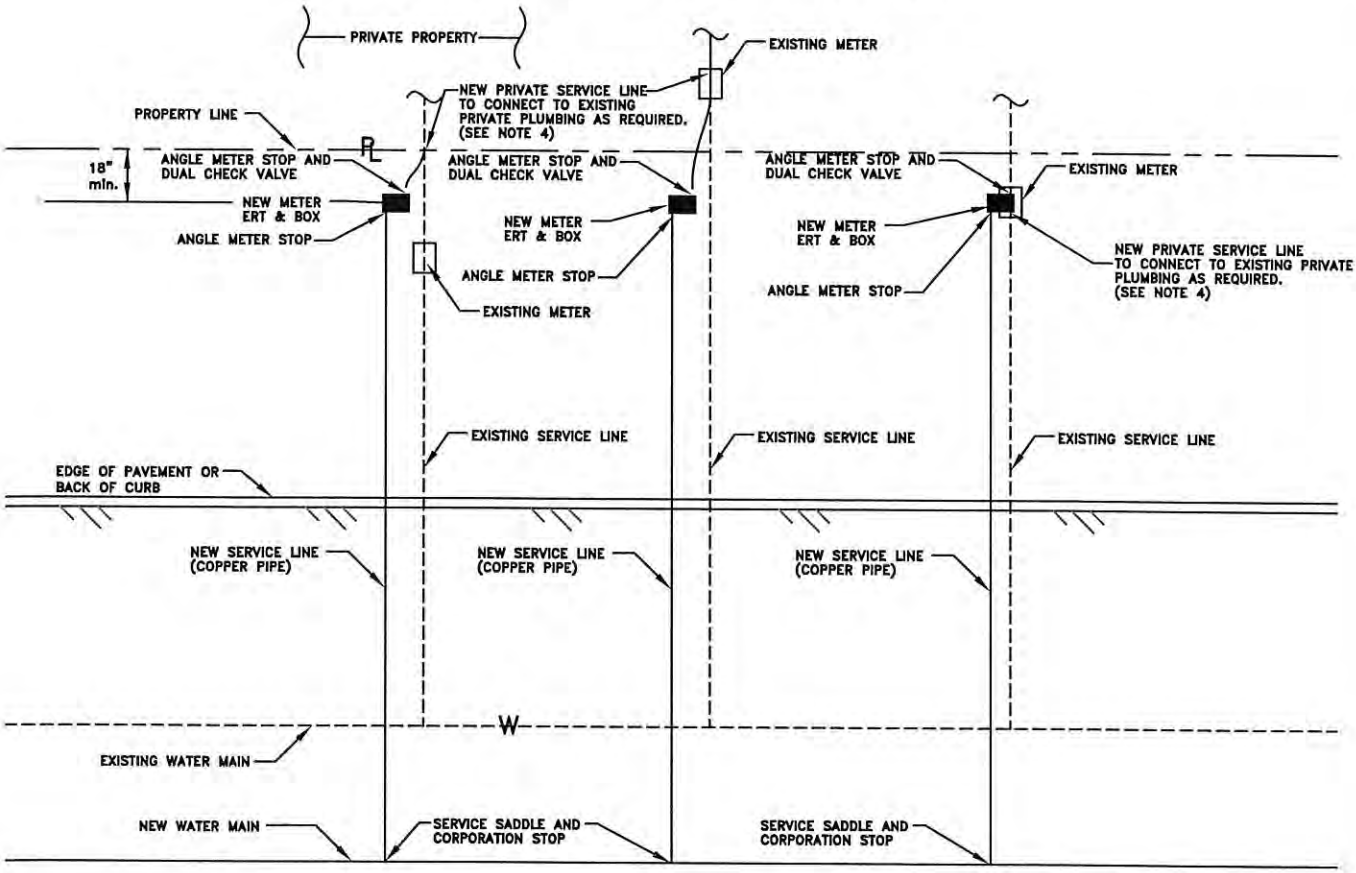
TYPICAL SERVICE RENEWALS



SERVICE RENEWAL (METER TO BE RELOCATED) | SERVICE RENEWAL (METER TO BE RELOCATED) | SERVICE RENEWAL (METER NOT TO BE RELOCATED)

TYPICAL SERVICE CONNECTIONS

SERVICE RENEWAL (METER TO BE RELOCATED)	SERVICE RENEWAL (METER TO BE RELOCATED)	SERVICE RENEWAL (METER NOT TO BE RELOCATED)
INCLUDES:	INCLUDES:	INCLUDES:
SERVICE SADDLE	SERVICE SADDLE	SERVICE SADDLE
CORPORATION STOP	CORPORATION STOP	CORPORATION STOP
TAP	TAP	TAP
SERVICE LINE (COPPER PIPE)	SERVICE LINE (COPPER PIPE)	SERVICE LINE (COPPER PIPE)
2 – ANGLE METER STOPS PER MW-309	2 – ANGLE METER STOPS PER MW-309	2 – ANGLE METER STOPS PER MW-309
DUAL CHECK VALVE PER MW-309	DUAL CHECK VALVE PER MW-309	DUAL CHECK VALVE PER MW-309
ADAPTER FITTINGS	ADAPTER FITTINGS	ADAPTER FITTINGS
PRIVATE SERVICE CONNECTION INCLUDING NEW PIPE AND ADAPTER FITTINGS	PRIVATE SERVICE CONNECTION INCLUDING NEW PIPE AND ADAPTER FITTINGS	PRIVATE SERVICE CONNECTION INCLUDING NEW PIPE AND ADAPTER FITTINGS
METER	METER	METER
ERT	ERT	ERT
METER BOX W/ LID	METER BOX W/ LID	METER BOX W/ LID

1. ORIENTATION OF METER SHALL BE IN ACCORDANCE WITH MW-309.
2. COPPER SERVICE PIPE SHALL BE 1" UNLESS OTHERWISE NOTED.
3. FOR HOMES BUILT AFTER 2001, CONTRACTOR IS TO VERIFY THE PRESENCE OF A THERMAL EXPANSION TANK PRIOR TO INSTALLING A DUAL CHECK VALVE. IF A THERMAL EXPANSION TANK IS NOT PRESENT, A DUAL CHECK VALVE IS NOT TO BE INSTALLED.
4. VERTICAL ADJUSTMENTS SHALL BE INCLUDED.

METRO WATER DISTRICT

WATER SERVICE RENEWALS AND TIE-OVERS

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

S.D.# MW-309

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DESCRIPTION:

THE WORK SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO ADJUST WATER METER BOXES AT THE LOCATIONS SHOWN IN THE PROJECT PLANS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THESE SPECIAL PROVISIONS.

MATERIALS:

FOR BADLY WORN OR BROKEN WATER METER BOXES AND LIDS, OR FOR WATER METERS NOT HAVING BOXES OR LIDS, THE CONTRACTOR SHALL NOTIFY THE MDWID PROJECT INSPECTOR. THE CONTRACTOR SHALL OBTAIN NEW WATER METER BOXES AND LIDS.

CONSTRUCTION REQUIREMENTS:

WHERE EXISTING WATER METER BOXES WILL BE ADJUSTED TO A NEW FINISHED GRADE, THE EXISTING METER BOXES SHALL BE SET IN ACCORDANCE WITH MW-309, PAGES 4, 5, AND 6.

METRO WATER DISTRICT

ADJUST METER BOX

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 05/2016

S.D.# MW-309

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NOTES:

1. ASSEMBLIES SHALL BE PROTECTED WITH A MINIMUM OF THREE (3) POST BARRICADES PER PC/DOT STANDARD DETAIL 106, TYPE B. MDWID WILL DETERMINE LOCATION OF POST BARRICADES BASED ON EXISTING CONDITIONS.

2. ITEMS INDICATED MAY BE SUBSTITUTED BY AN APPROVED EQUAL.

3. IF ANY VARIANCE TO THE ENCLOSURE IS TO BE MADE, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE COMBINATION AIR/VACUUM RELEASE VALVE ENCLOSURE PRIOR TO CONSTRUCTION.

4. BENDS MAY VARY TO LOCATE ARV OUTSIDE TRAVELED WAY. MAINTAIN POSITIVE SLOPE FOR DRAINAGE.

5. RESTRAIN ALL JOINTS 3" AND LARGER.

METRO WATER DISTRICT

COMBINATION AIR/VACUUM RELEASE VALVE NOTES

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

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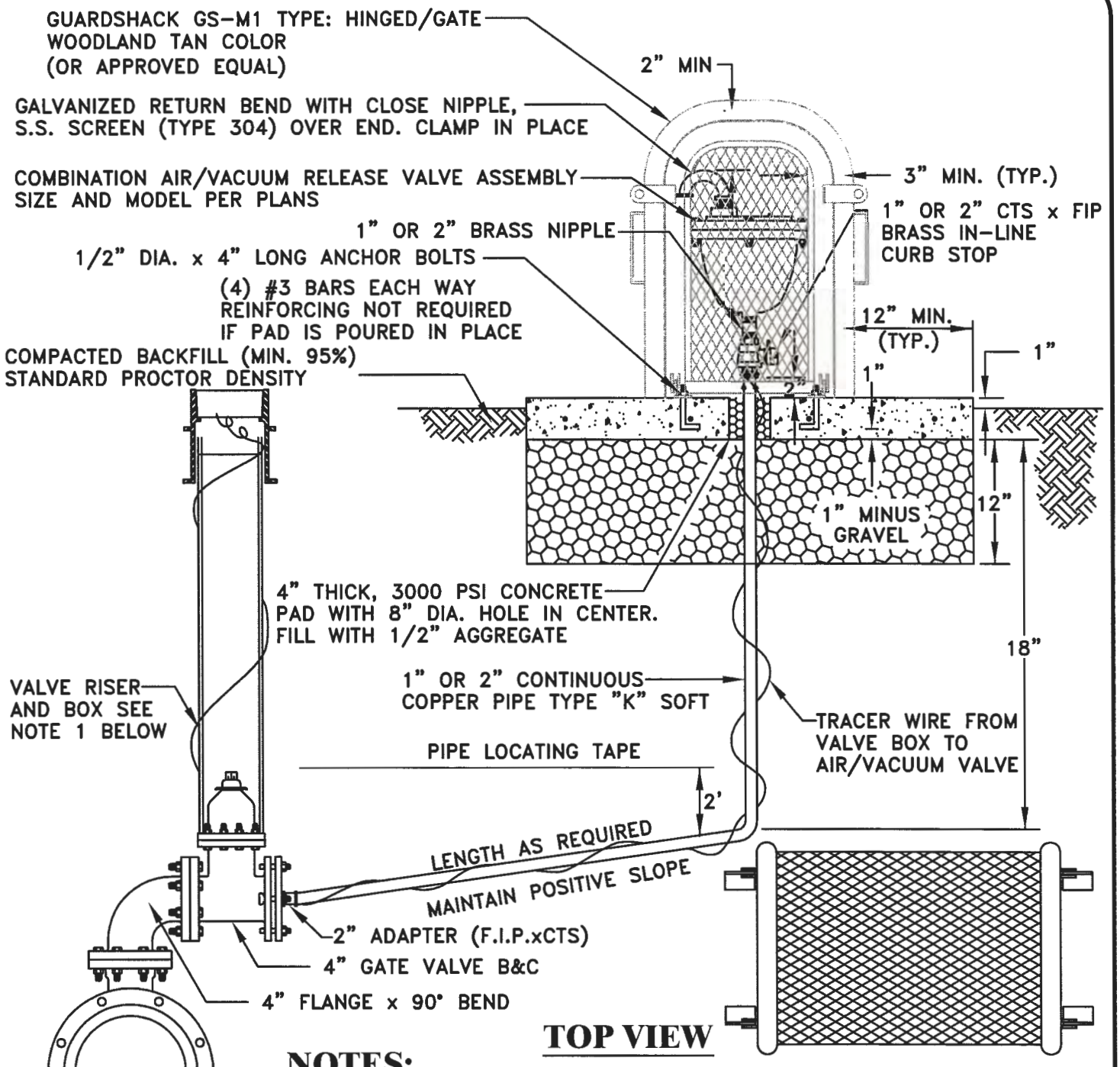
S.D.# MW-330



TOP VIEW

NOTES:

1. VALVE NUT EXTENSION REQUIRED WHERE DEPTH TO TOP OF NUT IS FIVE FEET (5') OR GREATER, SEE MDWID STANDARD DETAIL MW-305 AND TUCSON WATER SD-305, SHEET 2.
2. FOR 1" ARV INSTALLATION – INSTALL 1" SERVICE SADDLE AND 1" CORP. STOP (CCxMIP).

NOTE: THIS DETAIL REPLACES TUCSON WATER STANDARD DETAIL SD-331.

METRO WATER DISTRICT

1" & 2" COMBINATION AIR/VACUUM RELEASE VALVE

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 07/2014

S.D.# MW-330

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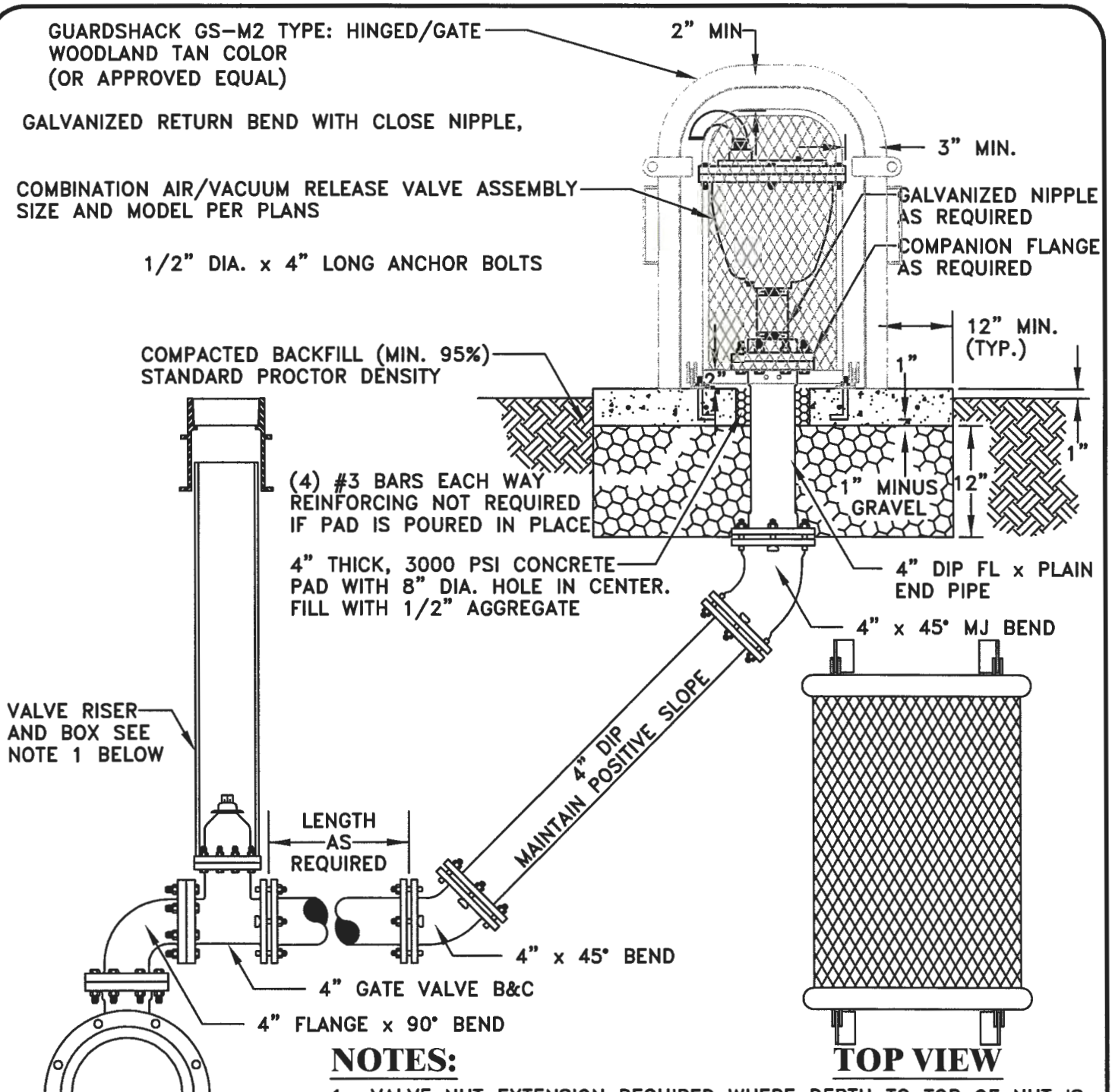

NOTES:

1. VALVE NUT EXTENSION REQUIRED WHERE DEPTH TO TOP OF NUT IS FIVE FEET (5') OR GREATER, SEE MDWID STANDARD DETAIL MW-305 AND TUCSON WATER SD-305, SHEET 2.
2. RESTRAIN ALL JOINTS.
3. ALL DIP, INCLUDING VALVES AND FITTINGS, SHALL BE ENCASED IN POLYETHYLENE IN ACCORDANCE WITH AWWA C105, METHOD A.

METRO WATER DISTRICT

3" & LARGER COMBINATION AIR/VACUUM RELEASE VALVE

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

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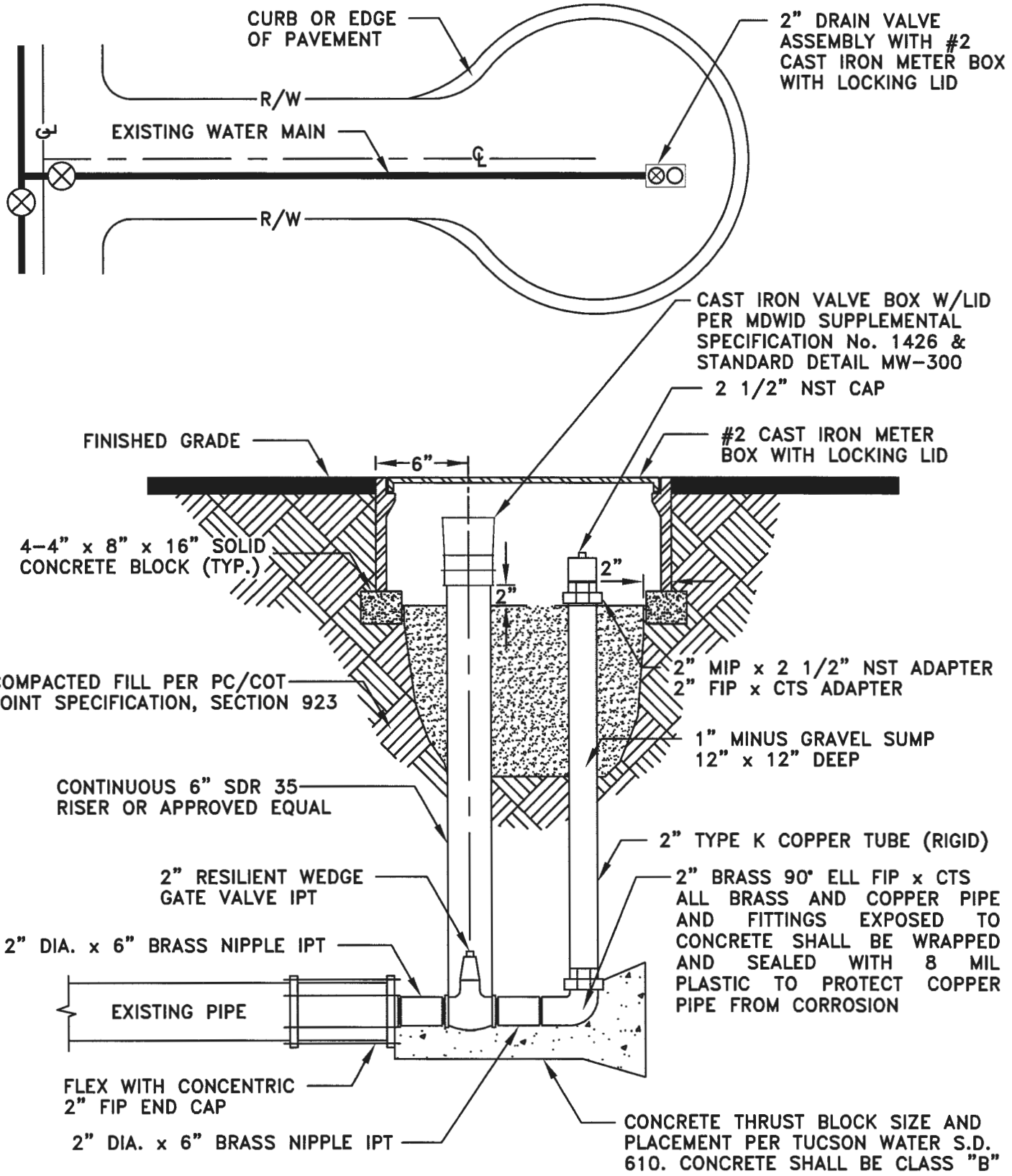

METRO WATER DISTRICT

DRAIN VALVE ASSEMBLY (EXISTING CONSTRUCTION)

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

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S.D.# MW-400

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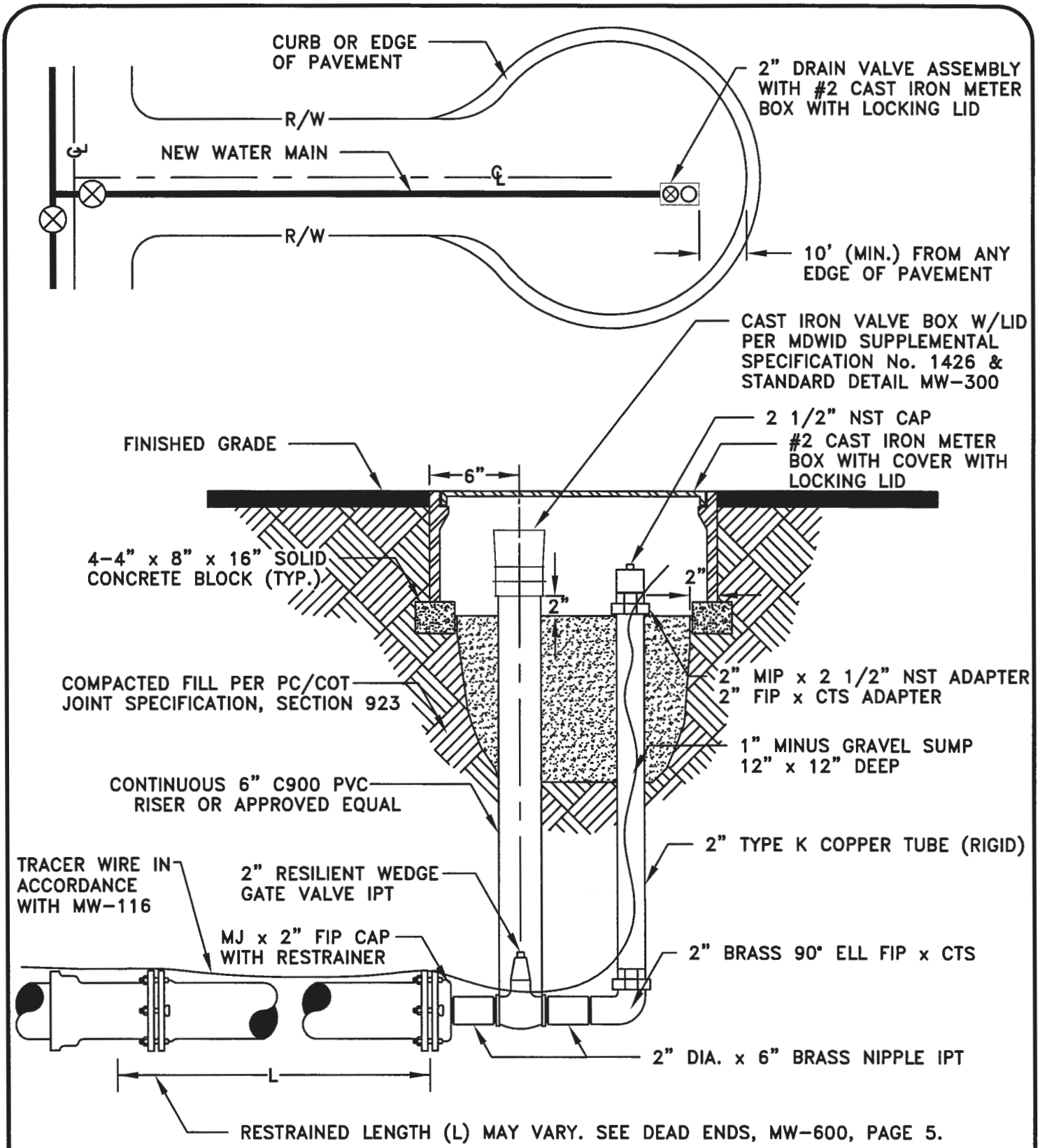

METRO WATER DISTRICT

DRAIN VALVE ASSEMBLY (NEW CONSTRUCTION)

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

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S.D.# MW-405

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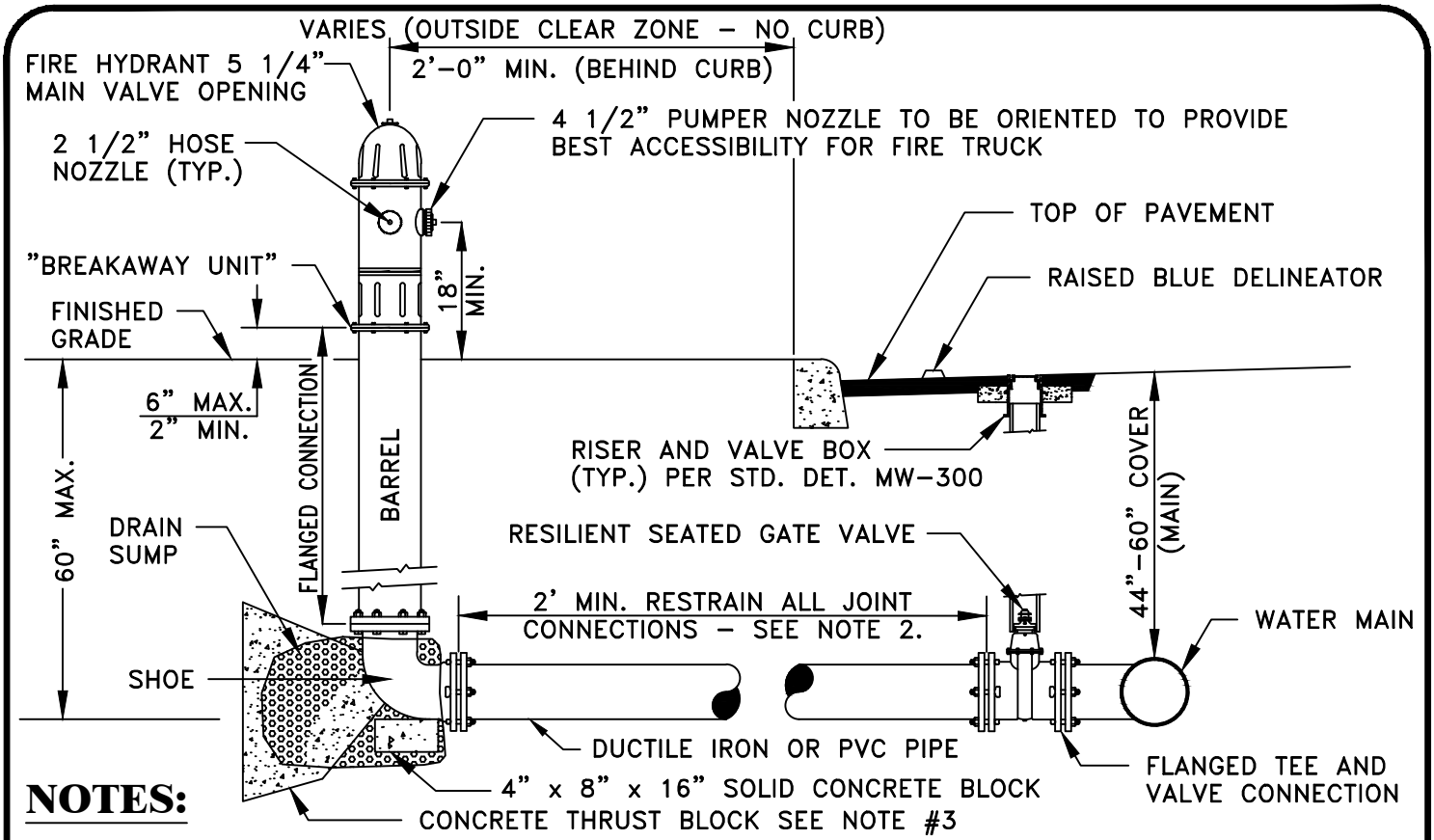

NOTES:

1. HYDRANT SHOE SHALL BE A MECHANICAL JOINT FITTING.
2. ALL MECHANICALLY RESTRAINED JOINT CONNECTIONS SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 1406 AND SHALL EXTEND FROM WATER MAIN TEE TO HYDRANT SHOE.
3. CONCRETE THRUST BLOCK PER TUCSON WATER SD–610 SHALL ONLY BE USED FOR EXTENDING EXISTING PIPE, WHICH IS NOT MECHANICALLY RESTRAINED, BETWEEN THE SHOE AND THE MAIN TEE.
4. A MINIMUM OF 8 CU. FT. OF ¾" GRAVEL CRUSHED ROCK SHALL BE PROVIDED FOR DRAIN SUMP. DRAIN SUMP SHALL BE A MINIMUM OF 3'–0" IN DIAMETER. COVER DRAIN HOLES WITH DRAIN SUMP MATERIAL.
5. HYDRANT LATERALS GREATER THAN 40 FEET IN LENGTH SHALL REQUIRE A GATE VALVE AT THE TEE AND WITHIN 10 FEET OF THE HYDRANT.
6. FOR WATER MAINS AT DEPTHS GREATER THAN 60 INCHES, THE ELEVATION OF THE BOTTOM OF THE HYDRANT SHOE SHALL BE ADJUSTED TO A DEPTH NO GREATER THAN 54 INCHES BY THE INSTALLATION OF FITTING AFTER THE TEE AND GATE VALVE.
7. ALL FIRE HYDRANTS SHALL BE FURNISHED WITH A 'CUSTODIAN' MODEL HYDRANT LOCKING MECHANISM BY HYDRA SHIELD. LOCKING MECHANISMS SHALL BE GIVEN TO THE PROJECT INSPECTOR FOR INSTALLATION BY MDWID STAFF.
8. REFER TO TUCSON WATER SD–500, SHEET 4 FOR STUB OUT TO BE USED FOR FUTURE FIRE HYDRANT INSTALLATION.
9. THIS DETAIL REPLACES TUCSON WATER SD–500, SHEET 1 OF 8 ONLY.

METRO WATER DISTRICT

FIRE HYDRANT INSTALLATION

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 06/2016

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S.D.# MW-500

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NOTES:

1. THE LENGTHS OF RESTRAINED OR CONTINUOUS PIPE CALLED OUT IN THE FOLLOWING TABLES ARE FOR INSTALLATION OF MECHANICALLY RESTRAINED FITTINGS AND ARE CALCULATED BASED ON THE FOLLOWING PARAMETERS:

   A) ALL DUCTILE IRON (DI) IS POLYETHYLENE ENCASED.

   B) THE SOIL TYPE IS "GM" OR "SM" AS DEFINED BY THE UNIFIED SOIL CLASSIFICATIONS, ASTM STANDARD D2487.

   C) THE TEST PRESSURE OF THE WATER SYSTEM IS TWO HUNDRED POUNDS PER SQUARE INCH (200 PSI), EXCEPT FOR TABLE 2, PAGE 6 FOR IN-LINE VALVES.

   D) THE TRENCH IS TYPE 5, AS PER ANSI/AWWA C150/A21.5, TRENCH CONDITIONS.

   E) THE DEPTH OF COVER IS THREE AND ONE-HALF FEET (3.5'), APPROXIMATELY 44".

   F) THE SAFETY FACTOR USED IS 1.5.

2. THE FOLLOWING RESTRAINT TABLES WILL BE USED UNLESS ALTERNATE TABLES FOR CONDITIONS OTHER THAN THOSE INCLUDED HEREIN ARE APPROVED BY THE DISTRICT ENGINEER OR SHOWN ON THE APPROVED PLANS.

3. ALL FITTINGS WITHIN THE CALCULATED RESTRAINED LENGTH SHALL BE RESTRAINED.

4. VALVES SHALL BE RESTRAINED IN ACCORDANCE WITH PAGE 6, THIS DETAIL.

5. MECHANICAL JOINT SLEEVES AND FABRICATED REPAIR COUPLINGS REQUIRE RESTRAINT WHEN THEY ARE WITHIN THE CALCULATED RESTRAINED LENGTH OF OTHER FITTINGS.

6. FOR EXAMPLES OF RESTRAINED LENGTH REQUIREMENTS, SEE MDWID STANDARD DETAIL MW-600A.

METRO WATER DISTRICT

RESTRAINED JOINT NOTES

ISSUED: 01/99 SCALE: N.T.S.

REVISED: _____

S.D.# MW-600

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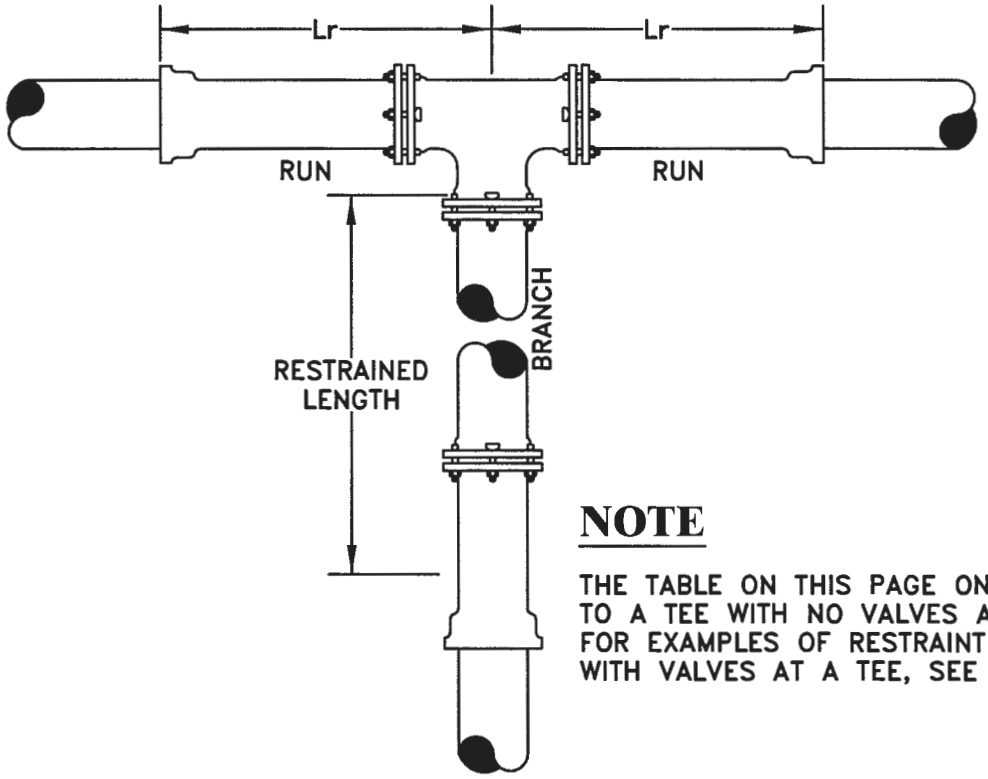
ALL THRUST RESTRAINTS SHALL BE IN COMPLIANCE WITH SECTION 1406.



NOTE

THE TABLE ON THIS PAGE ONLY APPLIES TO A TEE WITH NO VALVES AT THE TEE. FOR EXAMPLES OF RESTRAINT CALCULATIONS WITH VALVES AT A TEE, SEE MW-600A

TEES

THE MINIMUM ATTACHED LENGTH OF PIPE (Lr) TO EXTEND IN EACH DIRECTION ALONG THE RUN OF THE TEE SHALL BE A SOLID PIPE WITHOUT JOINTS, FITTINGS, ETC. THE LENGTH OF THE RESTRAINED BRANCH SHALL BE DERIVED FROM THE FOLLOWING TABLE. FOR RESTRAINT OF TAPPING SLEEVES, USE Lr EQUAL TO ZERO (0).

TEE SIZE (IN) & PIPE MATERIAL		MINIMUM ATTACHED LENGTH OF PIPE (Lr)										
		0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'
		LENGTH OF RESTRAINED BRANCH (FT)										
PVC	4x4	45	33	21	9	1	1	1	1	1	1	1
	6x4	45	27	9	1	1	1	1	1	1	1	1
	6x6	63	51	39	26	14	2	1	1	1	1	1
	8x4	45	21	1	1	1	1	1	1	1	1	1
	8x6	63	47	31	15	1	1	1	1	1	1	1
	8x8	83	70	58	46	33	21	9	1	1	1	1
	12x4	45	8	1	1	1	1	1	1	1	1	1
	12x6	63	38	13	1	1	1	1	1	1	1	1
	12x8	83	64	45	26	7	1	1	1	1	1	1
	12x12	118	105	92	80	67	54	42	29	17	4	1
DI, POLY	4x4	67	49	31	13	1	1	1	1	1	1	1
	6x4	67	40	13	1	1	1	1	1	1	1	1
	6x6	94	76	58	39	21	3	1	1	1	1	1
	8x4	67	31	1	1	1	1	1	1	1	1	1
	8x6	94	70	46	22	1	1	1	1	1	1	1
	8x8	124	105	87	68	50	31	13	1	1	1	1
	12x4	67	13	1	1	1	1	1	1	1	1	1
	12x6	94	57	20	1	1	1	1	1	1	1	1
	12x8	124	95	67	39	11	1	1	1	1	1	1
	12x12	175	156	137	118	100	81	62	43	25	6	1

METRO WATER DISTRICT

RESTRAINED JOINTS

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 07/2014

S.D.# MW-600

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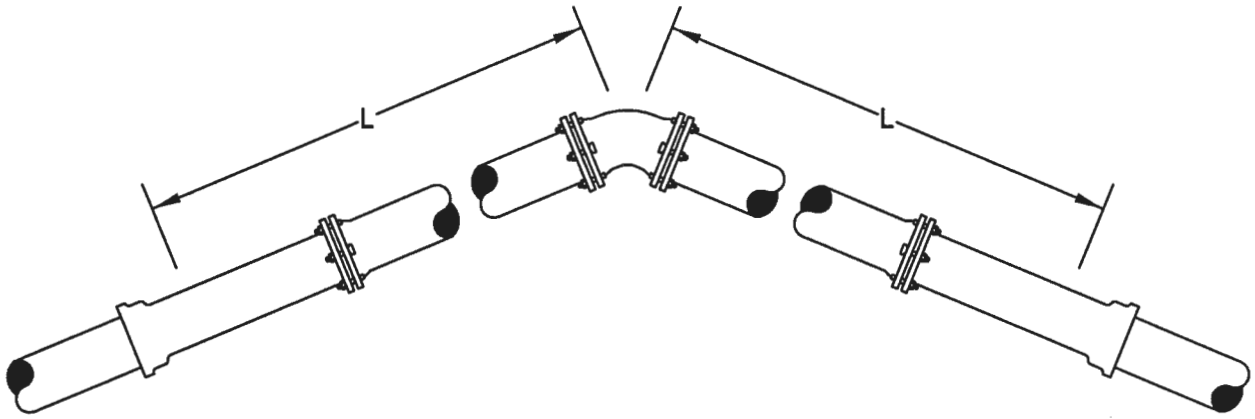

HORIZONTAL BENDS

THE MINIMUM RESTRAINED LENGTH OF PIPE (L) TO EXTEND IN BOTH DIRECTIONS FROM THE HORIZONTAL BEND SHALL BE DERIVED FROM THE FOLLOWING TABLE. FOR MULTIPLE HORIZONTAL BENDS, SEE NOTE BELOW.

PIPE SIZE (IN) & MATERIAL		HORIZONTAL BENDS			
		11.25°	22.5°	45°	90°
		LENGTH OF RESTRAINT (FT)			
PVC	4"	1	3	6	15
	6"	2	4	9	21
	8"	3	5	11	27
	12"	4	8	16	38
DI, POLY	4"	2	3	7	17
	6"	2	5	10	23
	8"	3	6	13	30
	12"	4	8	18	42

NOTE:

IN CASES WHERE THE RESTRAINED LENGTH OF PIPE (L) OVERLAP BETWEEN MULTIPLE HORIZONTAL BENDS, RESTRAINT REQUIREMENTS SHALL BE BASED ON COMBINED BEND ANGLE.

METRO WATER DISTRICT

RESTRAINED JOINTS

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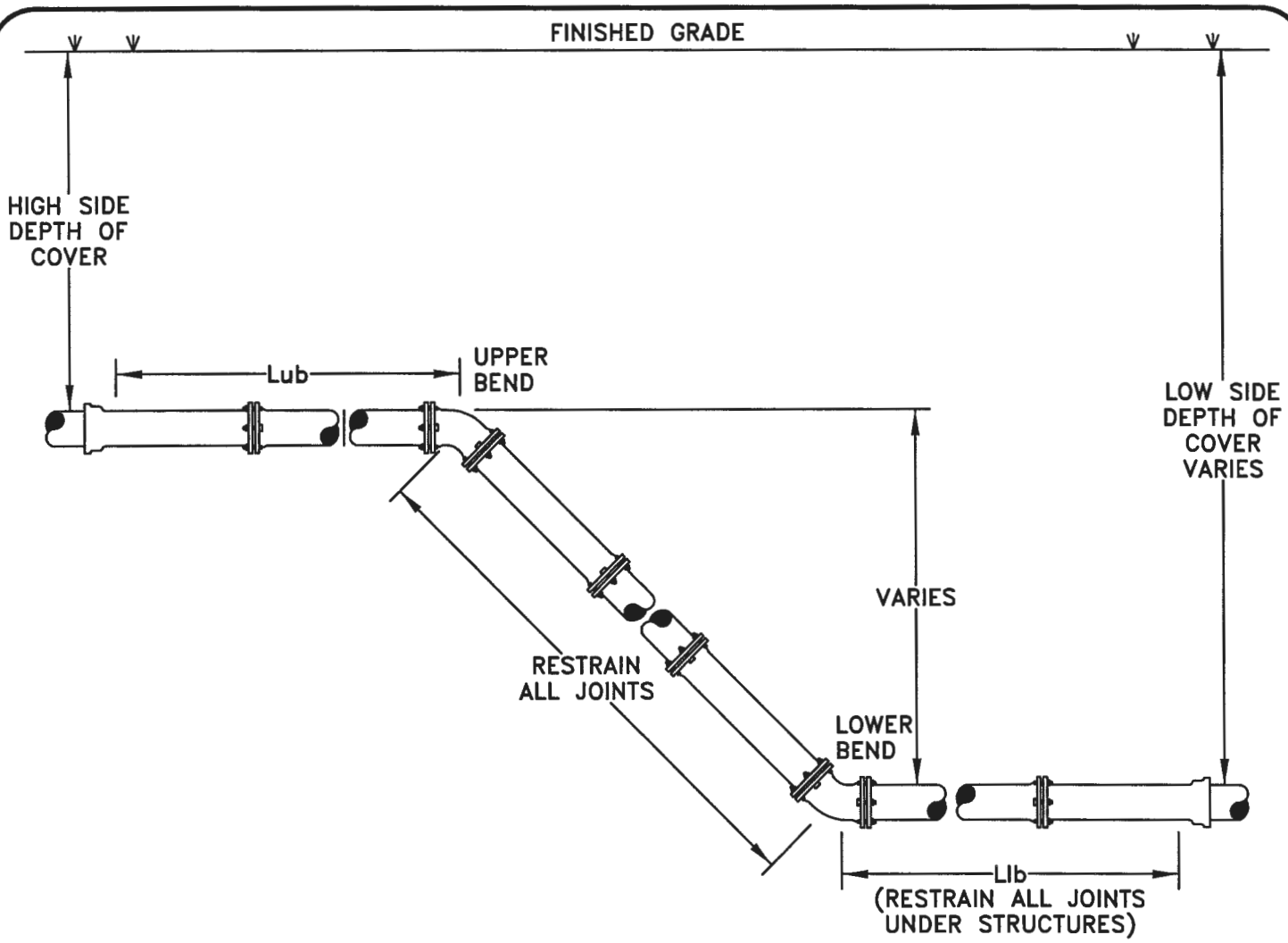

VERTICAL OFFSETS

THE MINIMUM RESTRAINED LENGTH OF PIPE FOR THE UPPER BEND (Lub) TO BE RESTRAINED ON BOTH SIDES OF THE VERTICAL OFFSET SHALL BE DERIVED FROM THE FOLLOWING TABLE. RESTRAINED LENGTHS SHOWN ARE BASED ON HIGH SIDE DEPTH OF COVER OF 3.5 FEET. FOR DIFFERENT CONDITIONS, CALCULATIONS WILL BE REQUIRED.
90° VERTICAL OFFSETS ARE NOT RECOMMENDED.

PIPE SIZE (IN) AND MATERIAL		UPPER BEND (Lub)			LOWER BEND (Llb)		
		11.25°	22.5°	45°	11.25°	22.5°	45°
		LENGTH OF RESTRAINT (FT)					
PVC	4"	4	9	19	1	3	5
	6"	6	13	26	2	4	8
	8"	8	16	34	2	5	10
	12"	12	23	49	3	7	14
DI, POLY	4"	7	13	28	1	3	6
	6"	9	19	39	2	4	9
	8"	12	25	51	3	5	11
	12"	17	35	72	4	7	16

METRO WATER DISTRICT

RESTRAINED JOINTS

ISSUED: 01/99 SCALE: N.T.S.
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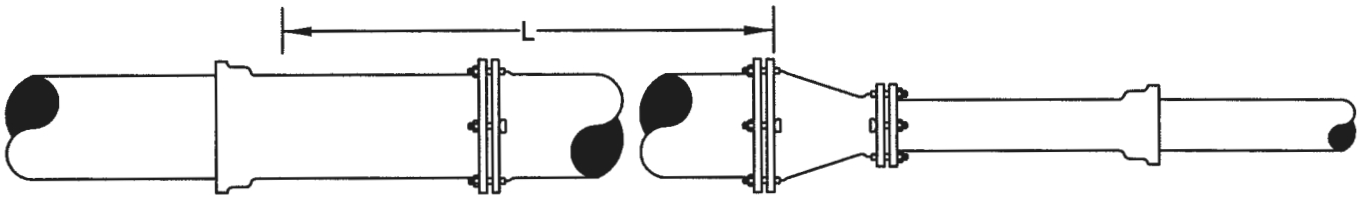
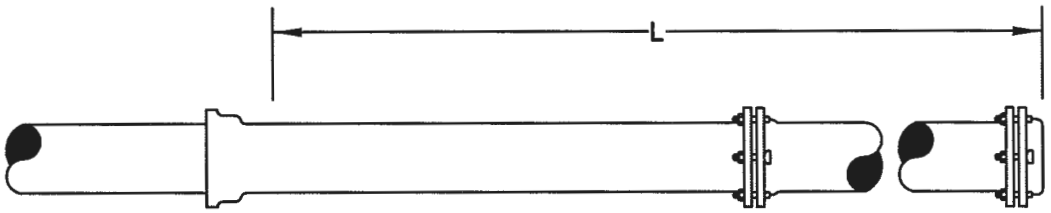


REDUCER SIZE (IN) & PIPE MATERIAL		MINIMUM RESTRAINED LENGTH (FT)
PVC	6x4	33
	8x4	60
	8x6	35
	12x4	102
	12x6	85
	12x8	62
DI, POLY	6x4	49
	8x4	89
	8x6	52
	12x4	152
	12x6	127
	12x8	93

REDUCERS

THE MINIMUM LENGTH OF PIPE (L) TO BE RESTRAINED ON THE LARGE SIDE OF THE REDUCER SHALL BE DERIVED FROM THE TABLE ON THE LEFT.



DEAD END SIZE (IN) & PIPE MATERIAL		MINIMUM RESTRAINED LENGTH (FT)
PVC	4	45
	6	63
	8	83
	12	118
DI, POLY	4	67
	6	94
	8	124
	12	175

DEAD ENDS

THE MINIMUM LENGTH OF PIPE (L) TO BE RESTRAINED ON A DEAD END SHALL BE DERIVED FROM THE TABLE ON THE LEFT.

METRO WATER DISTRICT

RESTRAINED JOINTS

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S.D.# MW-600

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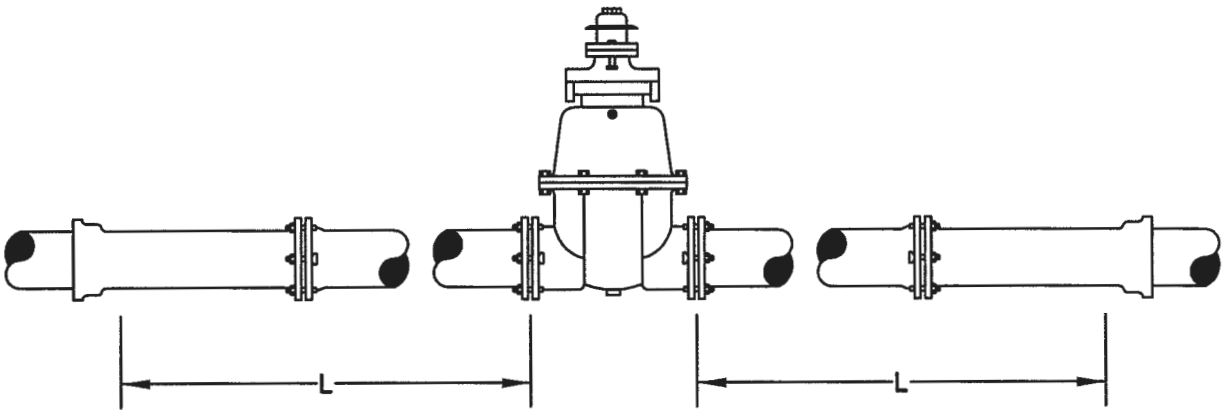

VALVES

THE MINIMUM LENGTH OF PIPE (L) TO BE RESTRAINED ON EACH SIDE OF THE VALVE SHALL BE DERIVED FROM THE APPROPRIATE TABLE BELOW.

TABLE 1

INCLUDES VALVES THAT ARE SUBJECT TO TEST PRESSURES (I.E., PROJECT PHASING, OFFSITE, AND TRANSMISSION LINES).

VALVE SIZE (IN) & PIPE MATERIAL		MINIMUM RESTRAINED LENGTH (FT)
PVC	4	45
	6	63
	8	83
	12	118
DI, POLY	4	67
	6	94
	8	124
	12	175

TABLE 2

VALVES USED ONLY FOR ISOLATION DURING NORMAL OPERATION. RESTRAINED LENGTHS CALCULATED USING 100 PSI.
NOTE: VALVES ARE NOT TO BE USED DURING TESTING OF NEW WATER SYSTEMS.

VALVE SIZE (IN) & PIPE MATERIAL		MINIMUM RESTRAINED LENGTH (FT)
PVC	4	22
	6	32
	8	41
	12	59
DI, POLY	4	33
	6	47
	8	62
	12	87

NOTES:

1. WHERE VALVES ARE CONNECTED TO FITTINGS OTHER THAN TEES, RESTRAINED LENGTH REQUIRED ON EACH SIDE OF FITTING SHALL BE DETERMINED USING THE APPROPRIATE TABLE ABOVE.
2. VALVES TO BE SUBJECT TO TEST PRESSURES ACCORDING TO TABLE 1 SHALL BE IDENTIFIED PRIOR TO CONSTRUCTION. FOR CLARIFICATION OR ADDITIONAL INFORMATION, CONTACT THE MDWID ENGINEERING DIVISION AT (520) 575-8100.

METRO WATER DISTRICT

RESTRAINED JOINTS

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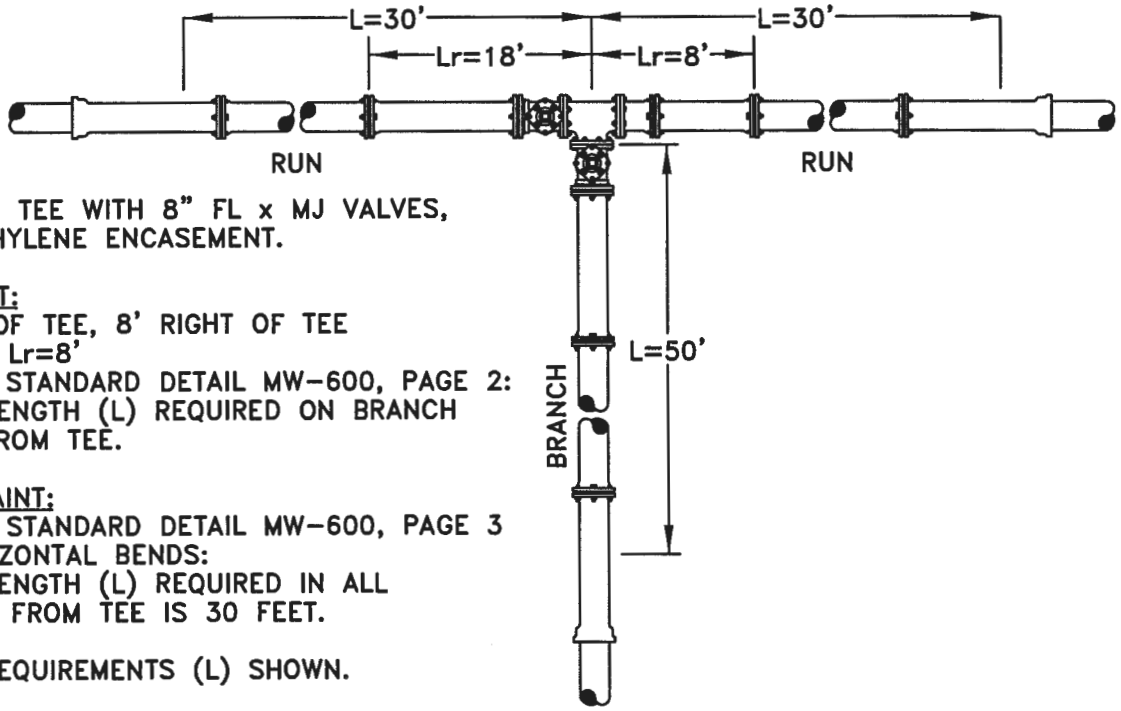
S.D.# MW-600



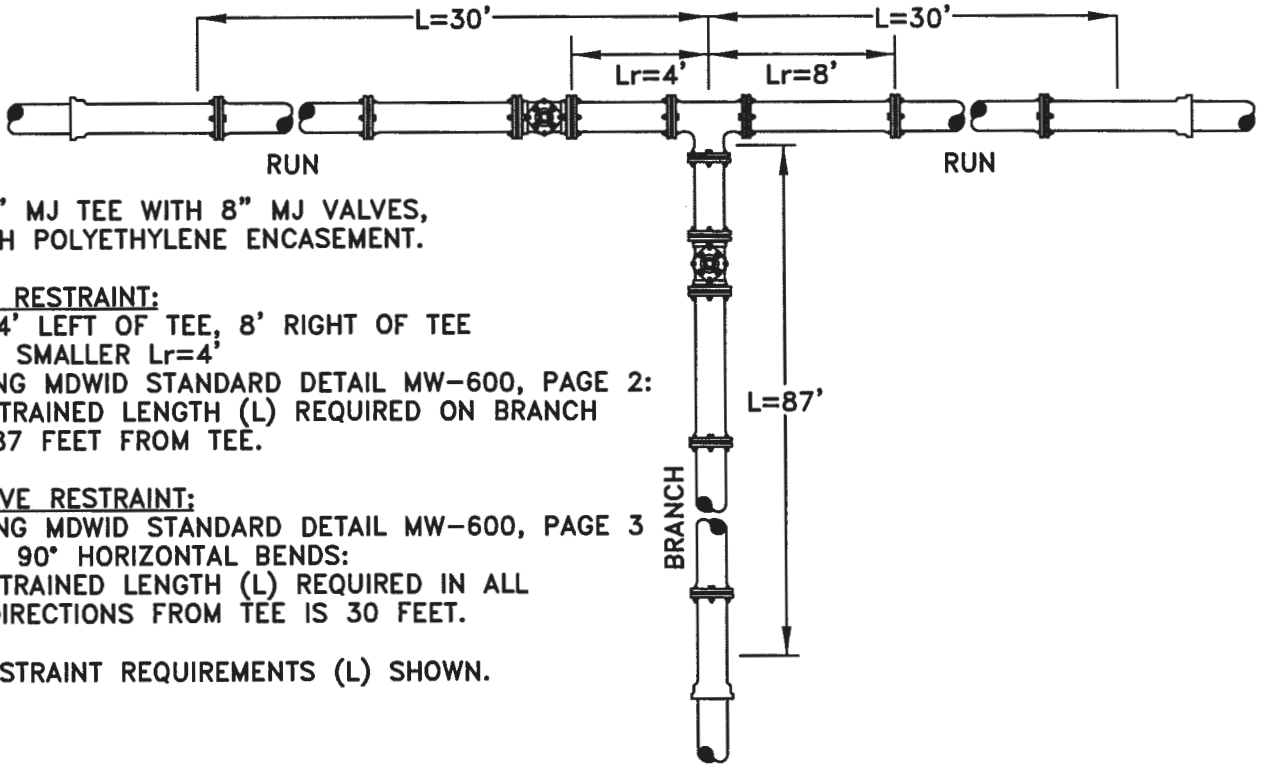
8" x 8" FLANGED TEE WITH 8" FL x MJ VALVES,
DIP WITH POLYETHYLENE ENCASEMENT.

A.) TEE RESTRAINT:
Lr=18' LEFT OF TEE, 8' RIGHT OF TEE
USE SMALLER Lr=8'
USING MDWID STANDARD DETAIL MW-600, PAGE 2:
RESTRAINED LENGTH (L) REQUIRED ON BRANCH
IS 50 FEET FROM TEE.

B.) VALVE RESTRAINT:
USING MDWID STANDARD DETAIL MW-600, PAGE 3
FOR 90° HORIZONTAL BENDS:
RESTRAINED LENGTH (L) REQUIRED IN ALL
3 DIRECTIONS FROM TEE IS 30 FEET.

USE RESTRAINT REQUIREMENTS (L) SHOWN.

FLANGED TEE WITH VALVES ON BRANCH AND RUN



8" x 8" MJ TEE WITH 8" MJ VALVES,
DIP WITH POLYETHYLENE ENCASEMENT.

A.) TEE RESTRAINT:
Lr=4' LEFT OF TEE, 8' RIGHT OF TEE
USE SMALLER Lr=4'
USING MDWID STANDARD DETAIL MW-600, PAGE 2:
RESTRAINED LENGTH (L) REQUIRED ON BRANCH
IS 87 FEET FROM TEE.

B.) VALVE RESTRAINT:
USING MDWID STANDARD DETAIL MW-600, PAGE 3
FOR 90° HORIZONTAL BENDS:
RESTRAINED LENGTH (L) REQUIRED IN ALL
3 DIRECTIONS FROM TEE IS 30 FEET.

USE RESTRAINT REQUIREMENTS (L) SHOWN.

MECHANICAL JOINT TEE WITH VALVES ON BRANCH AND RUN

METRO WATER DISTRICT

RESTRAINED JOINT EXAMPLES

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 06/2004

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S.D.# MW-600A

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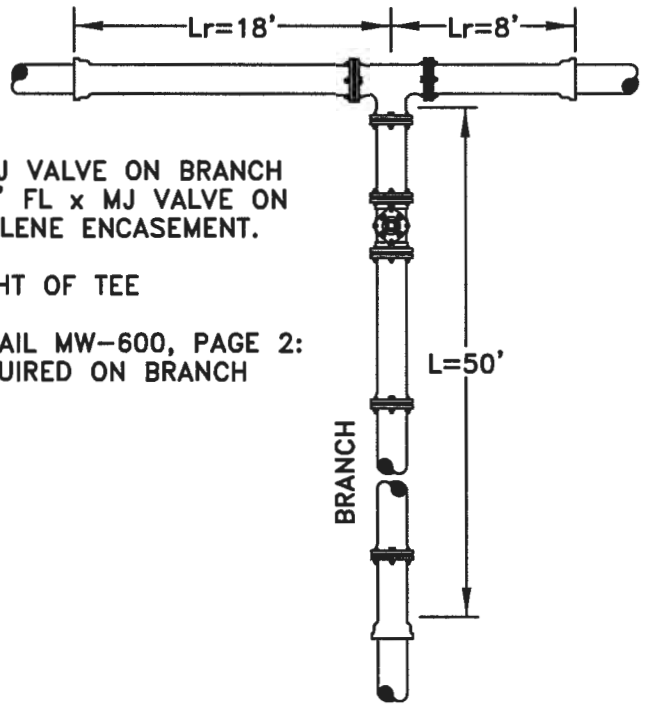
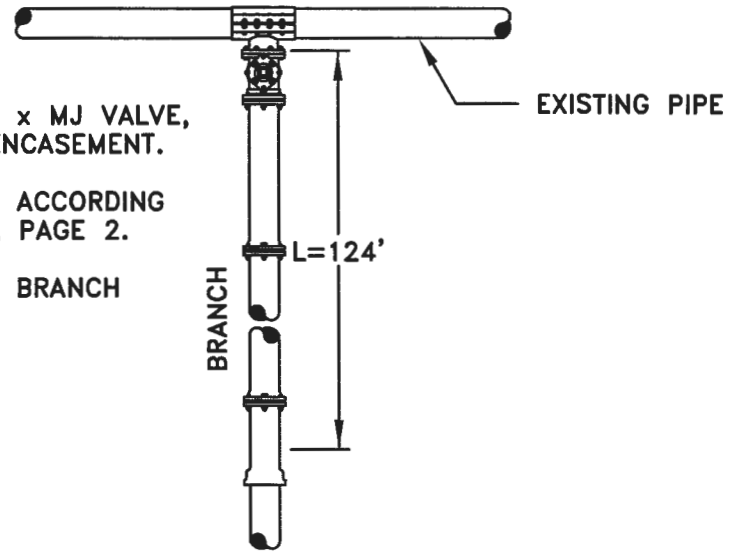


8" x 8" MJ TEE WITH 8" MJ VALVE ON BRANCH OR 8" x 8" FL TEE WITH 8" FL x MJ VALVE ON BRANCH, DIP WITH POLYETHYLENE ENCASEMENT.

Lr=18' LEFT OF TEE, 8' RIGHT OF TEE
USE SMALLER Lr=8'
USING MDWID STANDARD DETAIL MW-600, PAGE 2:
RESTRAINED LENGTH (L) REQUIRED ON BRANCH
IS 50 FEET FROM TEE.

TEE WITH VALVE ON BRANCH ONLY



8" x 8" TAPPING SLEEVE WITH 8" FL x MJ VALVE, BRANCH IS DIP WITH POLYETHYLENE ENCASEMENT.

ASSUME Lr=0' AND RESTRAIN BRANCH ACCORDING TO MDWID STANDARD DETAIL MW-600, PAGE 2.

RESTRAINED LENGTH (L) REQUIRED ON BRANCH IS 124 FEET.

TAPPING SLEEVE WITH VALVE

METRO WATER DISTRICT

RESTRAINED JOINT EXAMPLES

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 06/2004

S.D.# MW-600A

MULTIPLE HORIZONTAL WHERE RESTRAINT REQUIRED ON HORIZONTAL RUN (HR) OVERLAPS OR IS SHORTER THAN REQUIRED RESTRAINED LENGTH

EXAMPLE: 8" DIP WITH POLYETHYLENE ENCASEMENT, 45° HORIZONTAL BENDS, HR=20'

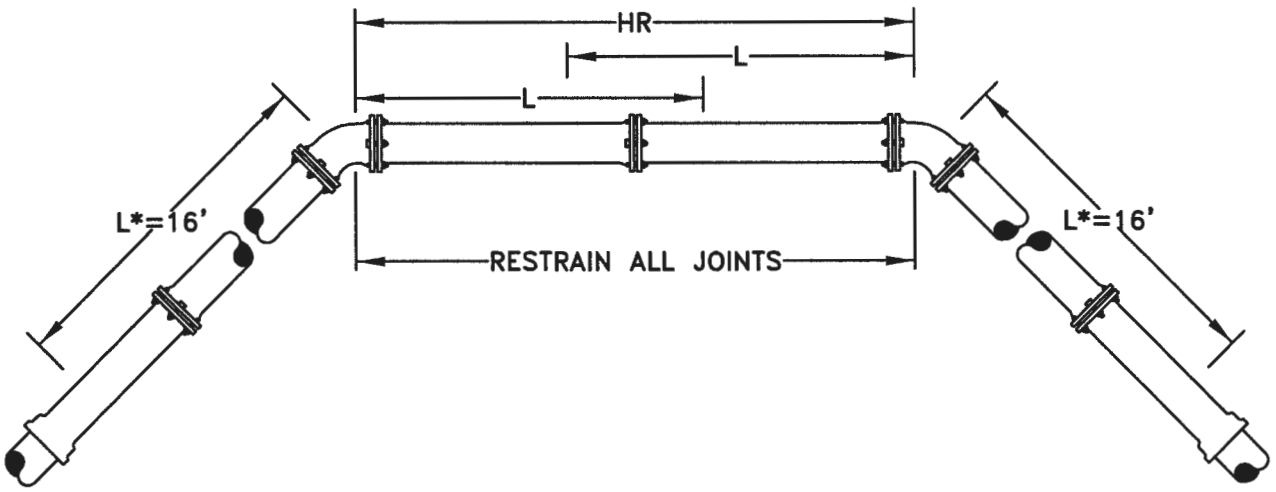
1. DETERMINE RESTRAINED LENGTH L USING MDWID STANDARD DETAIL MW-600, PAGE 3.

   L=13'

   2L=26' IS GREATER THAN HR=20'

2. DETERMINE REVISED RESTRAINED LENGTH (L*) REQUIRED AS FOLLOWS:

   $L^* = 2L - \frac{HR}{2} = 2(13') - \frac{20'}{2} = 16'$



METRO WATER DISTRICT

RESTRAINED JOINT EXAMPLES

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 06/2004

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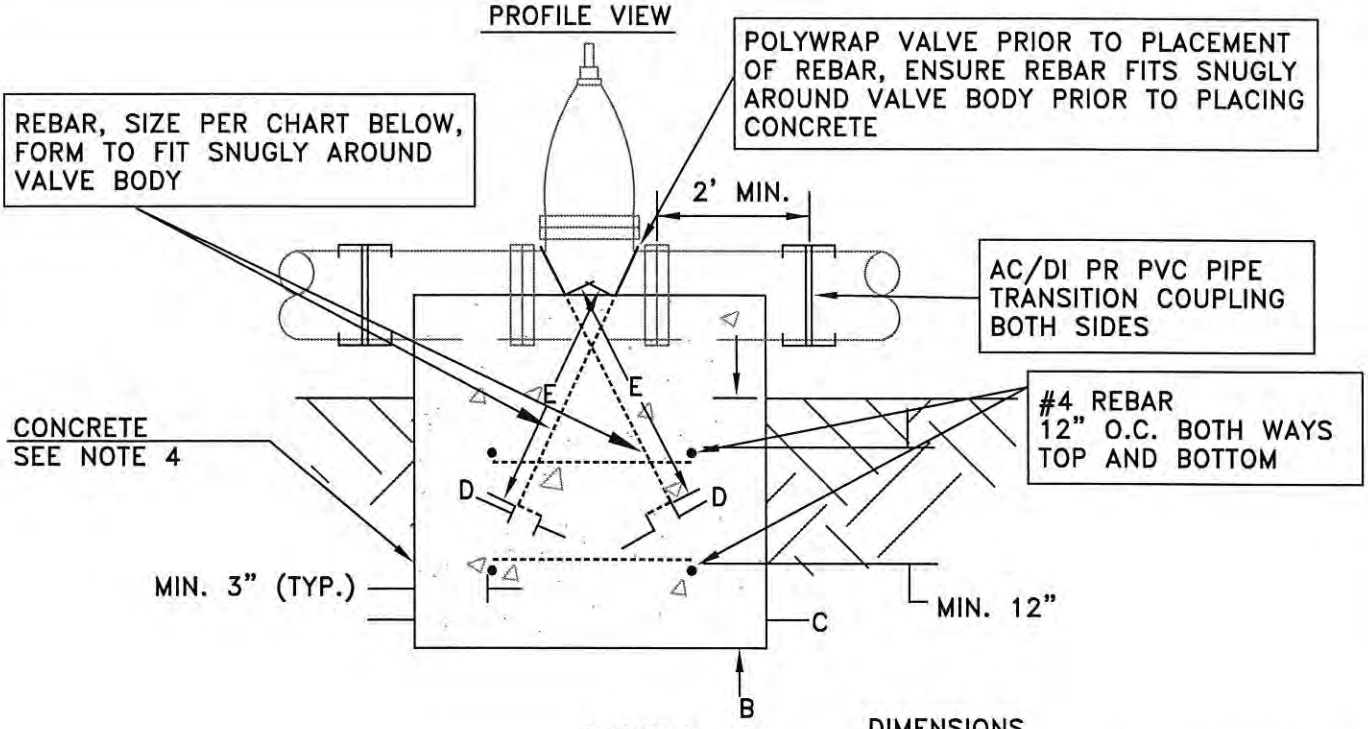
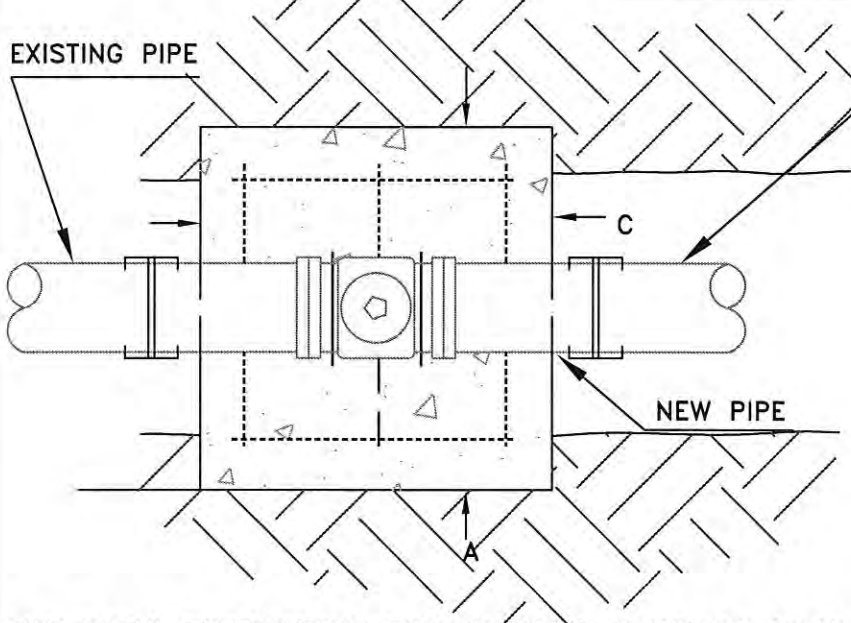
PROFILE VIEW



NOMINAL PIPE SIZE	BAR SIZE	DIMENSIONS A	B	C	D	E
4"	#4	2.5'	1.5'	1.5'	0.5'	1.0'
6"	#5	3.5'	2.0'	2.0'	0.7'	1.5'
8"	#6	3.5'	2.5'	2.5'	0.8'	2.0'
12"	#7	5.5'	3.5'	3.5'	1.0'	3.0'

PLAN VIEW



NOTES:

1. DIMENSION "B" IS MEASURED FROM BOTTOM OF TRENCH.
2. PLACE CONCRETE UP TO SPRINGLINE OF PIPE.
3. PLACE CONCRETE IN ALL DIMENDIONS AGAINST UNDISTURBED SOIL.
4. USE HIGH EARLY STRENGTH CONCRETE RATED AT 2500 PSI IN 24 HR (MIN.).
5. CONCRETE THRUST BLOCKS SHALL NOT BE INSTALLED ON AN EXISTING VALVE ON AC PIPE.

THIS DETAIL SUPPLEMENTS TUCSON WATER STANDARD DETAIL SD-610.

METRO WATER DISTRICT

CONCRETE VALVE THRUST BLOCK

ISSUED: 07/2014 SCALE: N.T.S.
REVISED: 09/2016

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BACKFLOW PREVENTION

NOTES:

1. THIS DETAIL SUPPLEMENTS TUCSON WATER STANDARD DETAILS SD-1800 - SD-1810.
2. ALL DETAILS, SEE MDWID SUPPLEMENTAL SPECIFICATION FOR BACKFLOW PREVENTION FOR INSTALLATION AND MATERIAL REQUIREMENTS.
3. ALL DETAILS, FOR ADDITIONAL INFORMATION CONTACT THE MDWID BACKFLOW PREVENTION INSPECTOR AT (520) 575-8100.
4. ALL DETAILS, INSTALLATIONS SHALL MEET CURRENT INTERNATIONAL PLUMBING CODES IN ADDITION TO TUCSON WATER STANDARD DETAILS.
5. SD-1801, ANY WATER TRUCKS OR TANKS THAT ARE FILLED FROM A POTABLE WATER SUPPLY SUCH AS A FIRE HYDRANT OR WATER HOSE SHALL BE FITTED WITH A REDUCED PRESSURE BACKFLOW ASSEMBLY OR BE FILLED THROUGH AN AIR GAP, WITH NO WAY TO BYBASS.
6. SD-1801, ALL HOSES USED TO FILL TANKS SHALL NOT HAVE BEEN USED TO CONVEY ANY SUBSTANCE OTHER THAN POTABLE WATER.
7. SD-1801, BACKFLOW PREVENTION FOR MOBILE UNITS SHALL BE INSPECTED AND APPROVED BY MDWID PRIOR TO USE.
8. SD-1801, HYDRANT MOUNTED RP BACKFLOW ASSEMBLY SHALL BE FURNISHED AND MAINTAINED BY THE CONTRACTOR, AND SHALL BE TESTED IN ACCORDANCE WITH MDWID SPECIFICATIONS AND ALL APPLICABLE CODES.

METRO WATER DISTRICT

BACKFLOW PREVENTION NOTES

ISSUED: 01/99 SCALE: N.T.S.
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S.D.# **MW-1800**

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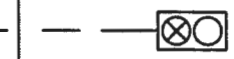
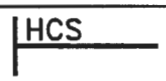
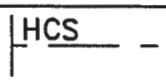
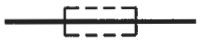
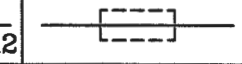
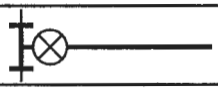
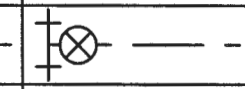
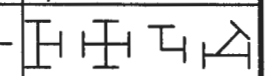
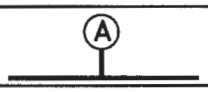
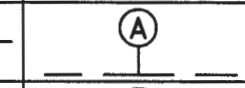
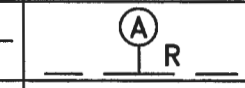
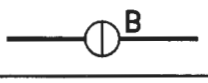
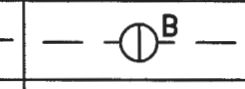
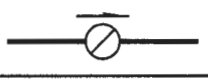
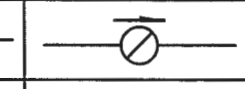
Description	Line Weight / Line Type	New	Line Weight / Line Type	Existing
Backflow Prevention Device	1 / N/A		0 / N/A	
Blow Off, Flushing Hydrant or Drain Valve Assembly	1 / N/A		0 / N/A	
Corrosion Monitoring Test Station	1 / N/A		0 / N/A	
Fire Hydrant	1 / N/A		0 / N/A	
House Connection Sewer	1 / Continuous		0 / Continuous	
Manhole, Reclaimed Water	1 / N/A		0 / N/A	
Manhole, Water	1 / N/A		0 / N/A	
Manhole, with Valve	1 / N/A		0 / N/A	
Pump Station, Booster	1 / N/A		0 / N/A	
Pump Station, Reclaimed Water	1 / N/A		0 / N/A	
Reducer or Increaser	1 / N/A		0 / N/A	
Steel Casing	1 / Cont./Dashed2		0 / Cont./Dashed2	
Tapping Sleeve and Valve	1 / Continuous		0 / Continuous	
Tee, Cross, Bends and Existing Wye	1 / Continuous		0 / Continuous	
Valve, Air Release	1 / N/A		0 / N/A	
Valve, Air Release and Reclaimed Water	1 / Continuous		0 / Continuous	
Valve, Butterfly	1 / N/A		0 / N/A	
Valve, Check (arrow in direction of flow)	1 / N/A		0 / N/A	
Valve, Isolation	1 / N/A		0 / N/A	

METRO WATER DISTRICT

PLAN SYMBOLS LEGEND

ISSUED: 01/99 SCALE: N.T.S.

REVISED: 06/2004

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S.D.# MW-1850

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Description	Line Weight / Line Type	New	Line Weight / Line Type	Existing
Valve, Pressure Reducing (show size & direction of flow)	1 / N/A	12" PRV	0 / N/A	12" PRV
Valve, Pressure Reducing W/Bypass (show size & direction of flow)	1 / N/A	12" PRV	0 / N/A	12" PRV
Valve, Reclaimed	1 / N/A	R	0 / N/A	R
Valve, Water	1 / N/A		0 / N/A	
Water Line	1 / Continuous		0 / Dashed	W 6"
Water Line (Abandoned)	1 / Dashed2	ABAN	0 / Dashed2	ABAN
Water Line, Protected (cover sheet only)	1 / Dot		0 / Dot	W 8"
Water Line, Reclaimed	1 / Continuous	R	0 / Dashed	R 8"
Water Meter and Box	1 / N/A		0 / N/A	

NOTES:

1. THE SIZE OF THE SYMBOLS ILLUSTRATED ON THIS DETAIL REPRESENTS THE ACTUAL SIZE AS DRAFTED ON A 1"=40' SCALE DRAWING.
2. ALL OTHER PLAN SYMBOLS SHALL CONFORM TO PC/COT STANDARD DETAILS FOR PUBLIC IMPROVEMENT, DETAIL 100.

METRO WATER DISTRICT

PLAN SYMBOLS LEGEND

ISSUED: 01/99 SCALE: N.T.S.
REVISED: 06/2004

S.D.# MW-1850

APPROVED MATERIALS LIST

Appendix A
MDWID Approved Materials
For
Pipe Sizes 4” thru 12”

Remove this Section and Replace with the following

The following list of approved materials for use in the MDWID system has been established from available information and historical use.

Pipe and appurtenances listed are in general from 4” to 12”. Service materials are from 1” to 2”.

Pipelines and appurtenances larger than 12” are project specific and require submittals to MDWID for approval for use in the system.

Appendix A
MDWID Approved Materials
For
Pipe Sizes 4” thru 12”

DISTRIBUTION SYSTEM

PIPE MATERIALS

CCP	AMERON
DUCTILE IRON	US PIPE/GRIFFIN (NXT, TYTON, TR FLEX,) PACIFIC STATES / CLOW (TYTON, FASTITE, TR FLEX, THRUST LOCK) AMERICAN (FASTITIE, FLEX-RING)
DUCTILE IRON PIPE INTEGRAL JOINT RESTRAINT	US PIPE/GRIFFIN (FIELD-LOK 350, TR-FLEX) PACIFIC STATE / CLOW (SURE STOP 350, TR-FLEX, THRUST-LOCK) AMERICAN (FASTGRIP, FLEX-RING)
PVC	VINYL TEC J.M. EAGLE / PW NORTH AMERICAN / CERTAINTEED DIAMOND
PVC SCH 40 & 80	SPEARS (Pipe & Fittings) CRESLINE APACHE
COPPER PIPE	TYPE “K” MADE IN USA
CAST IRON AND DUCTILE IRON FITTINGS AWWA C-110	TYLER UNION US PIPE CLOW STAR SIGMA SIP

Appendix A
MDWID Approved Materials
For
Pipe Sizes 4” thru 12”

DUCTILE IRON COMPACT FITTINGS AWWA C-153	TYLER UNION SIGMA US PIPE CLOW STAR SIP
FLEXIBLE COUPLINGS	SMITH BLAIR (OMNI, QUANTUM) JCM (200 SERIES) FORD (FC1-Z STYLE, FC2W- Q-STYLE, FCR STYLE, MJC-I STYLE) ROMAC (501, RC501, MACRO HP, ALPHA) HYMAX

PIPE RESTRAINTS

DUCTILE IRON PIPE (DIP)

US PIPE	-(FIELD-LOK, TR FLEX)
AMERICAN	-(FASTGRIP, FLEX-RING)
PACIFIC STATES	-(THRUST-LOCK)
GRIFFIN	-(SNAP-LOK)
FORD	-(UFA400 SERIES, 1450)
EBBA IRON	-(1100 SERIES, 1700, 2100)
ROMAC	-(600 SERIES, ROMA GRIP, RFCA, ALPHA,)
MUELLER	-(AQUA GRIP)
STAR	-(STARGRIP SERIES 3000, SERIES 3200)
SIGMA	-(ONE-LOK SERIES SLDE)
TYLER UNION	-(SURE STOP 350)
SIP	-(EZ GRIP for DIP)

POLYVINYL CHLORIDE PIPE (PVC)

FORD	-(UFA900, 1300, 1350, 1360, 1390)
EBAA IRON	-(1500, 1600, 2500)
ROMAC	-(600 SERIES, ROMA GRIP, GRIP RING, ALPHA)
MUELLER	-(AQUA GRIP)

Appendix A
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For
Pipe Sizes 4" thru 12"

STAR	-(PVCGRIP SERIES 3500, 1000C, 1100C)
SIGMA	-(SERIES PWM, PWP)
SIP	-(EZ GRIP PTP SERIES for PVC)

REPAIR CLAMPS	ROMAC (SS1, SL1, C) SMITH BLAIR (256, 261) FORD METER BOX (FS1, FLS1) JCM (131, 161) POWER SEAL – (3121AS) HYMAX (VERSA-MAX, EZ-MAX)
TAPPING SLEEVES	ROMAC (SST, SSTIII, STS420) SMITH BLAIR (663 SERIES) MUELLER (H-304SS) FORD (FAST-SP style) POWERSEAL (3480, 3490)

VALVES

AIR RELEASE VALVES ¾" to 6"	VALMATIC (VM-201C, VMC-203C, VMC-206C, VMC-101S/22, VMC-101S/38, VMC-104S/22, VMC-104S/38, VMC-106S/38, VMC-106S/45) GA INDUSTRIES (FIGURE 945, 950/951, & 960/961) CRISPIN (C SERIES) APCO (SERIES 1800, 140C)
BUTTERFLY VALVES	CLOW M & H MUELLER PRATT
CHECKVALVES	AMERICAN FLOW CONTROL VALMATIC CRISPIN

Appendix A
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For
Pipe Sizes 4” thru 12”

	MUELLER
GATE VALVES	AMERICAN FLOW CONTROL (SERIES 2500) CLOW (MODEL 2639/2640, 2638) MUELLER (SERIES A-2360) M & H (STYLE 4067, 7000) US PIPE (USP0)
PRESSURE REDUCING VALVES	CLA-VAL (PER PROJECT PLANS) BERMAD (PER PROJECT PLANS)
FIRE HYDRANTS	AMERICAN FLOW CONTROL (WATEROUS PACER) CLOW (MEDALLION) MUELLER (SUPER CENTURION)
AIR RELEASE VALVE ENCLOSURES	GUARDSHACK – GS-M1, GS-M2 (WOODLAND TAN)

SERVICE MATERIALS

CORPORATION STOPS, UNIONS ANGLE METER STOPS, SERVICE SADDLES, AND U-BRANCHES	MUELLER JAMES JONES A.Y. McDONALD FORD SMITH BLAIR CAMBRIDGE BRASS POWER SEAL (3412AS, 3416AS, 3422AS) ROMAC (101NS, 202NS)
COPPER PIPE	TYPE “K” MADE IN USA

Appendix A
MDWID Approved Materials
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Pipe Sizes 4” thru 12”

METER BOXES	LOPEZ (CAST IRON) STAR (CAST IRON) ALLIED BUILDING SUPPLIES (CONCRETE) SIGMA (CAST IRON) DFW (PLASTIC/POLYMER) –DFW37C-12-1AM-METRO -DFW1324C-12-1AM-METRO -DFW1730-12-1AM-METRO OLDCASTLE/CHRISTY (CONCRETE) – B1324 -FOR DVA ONLY
VALVE BOXES	SIGMA EAST JORDAN IRON WORKS LOPEZ STAR

COATINGS

PAINT	TENEMEC SHERWIN WILLIAMS
MARKING PAINT	
SEYMOUR PAINT	PRECAUTION BLUE
SPRAYON PAINT	APWA BLUE

MAGNETIC DETECTOR AND MARKING TAPE	REEF INDUSTRIES ALARMA TAPE PROLINE HYTECH NORTH TOWN HARRIS INDUSTRIES LINETEC TERRA TAPE CHRISTY’S

Appendix A
MDWID Approved Materials
For
Pipe Sizes 4” thru 12”

CORROSION MATERIALS

VENDOR/MANUFACTURER	MATERIAL
ERICO/CADWELD	EXOTHERMIC WELDING MATERIALS – WELD METALS, WELDERS, SLEEVES
CONTINENTAL/THERM-O-WELD	EXOTHERMIC WELDING MATERIALS - WELD METALS, WELDERS, SLEEVES
CALPICO	EXOTHERMIC MATERIALS – “T” CAPS, #22 PRIMER, #10 MASTIC FLANGE INSULATION KITS NON-CONDUCTIVE TAPES – 2” (V1-10, VINYL IDENTIFIED) 4” (V1-20, VINYL IDENTIFIED)
ROYSTON MFG.	EXOTHERMIC MATERIALS – “T” CAPS, #22 PRIMER, #10 MASTIC
GENERIC – NON VENDOR SPECIFIC	COLORED PVC MARKING TAPES #1 CAST IRON METER BOXES PHENOLIC RESIN BOARDS – MICARTA NUTS, MACHINE SCREWS, FLAT WASHERS, LOCKING WASHERS
THOMAS & BETTS	ALUMINUM COMPRESSION CONNECTORS – #60107, #60102, #60097, #60500, #60501, #60507
COTT MFG	BIG FINK CATHODIC PROTECTION TEST STATIONS – DARK BLUE PURPLE LOCKING DEVICE – ASS-LD-0001
APS / BOLT BROKERS	FLANGE INSULATING KIT

Appendix A
MDWID Approved Materials
For
Pipe Sizes 4” thru 12”

CALPICO	FLANGE INSULATING KIT
CENTRAL	FLANGE INSULATING KIT
HMS	FLANGE INSULATING KIT
PIKOTEK	FLANGE INSULATING KIT
PSI	FLANGE INSULATING KIT
NORTHTOWN	FLANGE INSULATING KIT

BACKFLOW PREVENTION ASSEMBLIES

- AN APPROVED MATERIAL LIST IS AVAILABE FROM THE BACKFLOW PREVENTION INSPECTION UNIT OF MDWID AT (520) 575-8100.