

SUMMARY: PROPOSED STANDARD SPECIFICATION REVISIONS – 2021 MWU ITEMS:

STANDARD SPECIFICATIONS

702.3.1 – DUCTILE IRON PIPE

Include domestic material requirement for specified pipe products. Specify bonding straps are rated for at least 500 amps. Conductive-tip gaskets remain for slip joint pipe, not MJ connections.

702.3.2 – POLYETHYLENE ENCASEMENT

Polywrap shall be three layer polywrap with antimicrobial and corrosion inhibitors, V-Bio or equal.

702.4.1 – MECHANICAL JOINT FITTINGS

Require conductivity to be established across fittings or mechanical joints by either field welded or mechanically connected bonding straps.

702.4.5 – SOLID REPAIR SLEEVES

Require conductivity to be established across solid repair sleeves by either field welded or mechanically connected bonding straps.

702.5.2 – SADDLES

Edit approved product list. Added multiple saddle products intended to accommodate new taps.

704.4 – HORIZONTAL DIRECTIONAL DRILL PIPE

If pre-installation pressure testing of HDPE is elected to be done, it must be done hydrostatically.

704.6 – FURNISH & INSTALL WATER VALVE

Require conductivity to be established across valves by either field welded or mechanically connected bonding straps.

704.7 – FURNISH & INSTALL HYDRANT / SALVAGE EXISTING HYDRANTS

Require conductivity to be established between hydrant assembly and distribution system mains by field welded bonding straps.

704.9 – FURNISH & INSTALL WATER SERVICE LATERALS

Correction of existing typos and convert curb rod depth-to-surface allowance from 4-FT to 3-FT.

704.17 – FURNISH & INSTALL INSULATION

Convert measurement unit from LF to EACH, for each 4-FT by 8-FT sheet of insulation installed.

704.9 – FURNISH & INSTALL CURB BOX

Convert curb rod depth-to-surface allowance from 4-FT to 3-FT.

BID ITEMS

70101 – FURNISH AND INSTALL INSULATION

Convert unit from LF to EACH.

DETAIL DRAWINGS

SDD 7.10 SERVICE LATERAL INSTALLATION

Adjust allowable maximum depth from rod to final grade (from 4-FT to 3-FT).
Include clarifying information to depict requirements for various service bid item requirements.

SDD 7.22 OFFSETTING EXISTING WATER MAIN UNDER UTILITY CONFLICTS

Minor typo revisions and clarifications.

SDD 7.28 – 7.41 WATER UTILITY STANDARD METER INSTALLATION DETAIL DRAWINGS

Minor revisions to eliminate some plastic piping and valves within standard meter-set areas.

702.3.1 Ductile Iron Pipe:

- (1) Ductile iron pipe and accessories shall conform to the requirements of American National Standard for Ductile Iron Pipe, Centrifugally Cast, for Water (ANSI/AWWA C151/A21.51 - latest revision).
- (2) Ductile iron pipe shall be manufactured in the United States. Upon request by the Engineer, Contractor shall furnish data certified by the manufacturer that all pipe is of domestic manufacture.
- (3) Pipe requirements:
 1. Class 52 ductile iron.
 2. Cement lined.
 3. Push-on joint.
 4. Furnished with all necessary accessories.
 5. Electrical conductivity.
 - i. Electrical conductivity shall be established through each joint by means of welded bonding strap connection, mechanical bonding strap connection, conductive-tip pipe joint gaskets, armor-tip mechanical joint gaskets, or serrated bronze conductivity wedges. Bonding straps shall be minimum 2 gauge copper wire capable of transmission of at least 500 amps, or Engineer approved equivalent.
 - ii. Serrated bronze wedges may be used with push-on joint pipe. Install pipe manufacturer approved wedges, two per joint, for 3-inch through 12-inch pipe; four for larger diameter pipe. Each wedge is driven into the opening between the plain end and the bell until snug. When four wedges are used, they are inserted side by side, in pairs.
 - iii. Any damage to asphaltic or epoxy coating materials and/or bonding strap connections require at least 2 mils of a corrosion resistant, bituminous, or rubberized undercoating material installed per manufacturer's recommendations.
- (4) Gaskets shall conform to the requirements of American National Standard for Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings (ANSI/AWWA C111/A21.11 - latest revision).
- (5) Gasket Requirements:
 1. Plain rubber gaskets.
 2. Conductive gaskets
 - i. Conductive-tip/armored-tip gaskets may be used to establish conductivity through push-on pipe joints ~~or pipe to mechanical joint fitting connections~~ in lieu of bonding straps, or conductivity wedges.
 - i. Conductive gaskets must be rated to accommodate electrical transmission of at least 500 amps.

- i. Conductive gaskets must be certified as compliant for use with the furnished pipe ~~or mechanical joint fitting~~ by the associated material manufacturer.
3. Restrained-joint locking gaskets.
 - i. Use restrained joint locking gaskets when electing to *or* are otherwise required to meet thrust-restraint requirements by means of restrained-joint pipe.
 - ii. Restrained-joint locking gaskets must be certified as compliant for use with the furnished pipe material by the pipe manufacturer.
4. Nitrile or Fluorocarbon gaskets may be required if water mains are near contaminated soils.

702.3.2 Polyethylene Encasement:

- (1) Polyethylene encasement materials shall conform to the requirements of the American National Standard for Polyethylene Encasement for Ductile Iron Pipe Systems (ANSI/AWWA C105/A21.5 - latest revision).
- (2) Polyethylene encasement for use with ductile iron pipe systems shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than eight mils. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of antimicrobial compound to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
- (3) Polyethylene Encasement Requirements:
 1. V-Bio Enhanced Polyethylene Encasement, or Engineer approved equivalent.
 2. Furnish in either tube or sheet form.

702.4.1 Mechanical Joint Fittings:

- (1) Mechanical joint fittings are to conform to the requirements of either:
 1. American National Standard for Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch, for Water (ANSI/AWWA C110/A21.10 - latest revision).
 - OR -
 2. American National Standard for Ductile Iron Compact Fittings, 3-inch through 64-inch for Water (ANSI/AWWA C153/A21.53-11 - latest revision).
- (2) Mechanical Joint Fitting Requirements:
 1. Class 250 mechanical joint pipe fittings.
 2. Cement lined.

3. All bells.

4. Entire fitting tarred.

~~5. Conductive mechanical joint (no lead).~~

6. Establish conductivity across fittings by means of mechanical or field-welded bonding straps, and any associated coating repairs per Section 702.3.1 (5) – ‘Electrical Conductivity.’ Bonding straps shall be minimum 2 gauge copper wire capable of transmission of at least 500 amps, or Engineer approved equivalent.

7. Furnished with all necessary accessories (rubber gaskets, flanges, bolts, etc.).

702.4.5 Solid Repair Sleeves:

- (1) Solid repair sleeves may only be used when standard mechanical joint solid sleeves will not fit over existing pipe without major modification, such as significant grinding of pipe.
- (2) Furnish solid repair sleeves with fluorocarbon or epoxy coated bolts per Section 702.4.3 – ‘Nuts and Bolts.’
- (3) Establish conductivity through the solid repair sleeve by means of **mechanical** or field-welded bonding strap and any associated coating repairs per Section 702.3.1 (5) – ‘Electrical Conductivity.’

702.5.2 Saddles:

(4) Saddles are required at:

1. All 1-½-inch and 2-inch service lateral taps which are not directly tapped into the main.
2. All service lateral taps on PVC, HDPE, or CIPP-lined water mains.

(5) Saddles shall be stainless steel, full circle, one piece, tapped repair clamps.

(6) Saddle width must equal or exceed pipe diameter.

(7) Approved saddles:

1. Smith-Blair 372 Double Bolt, Stainless Steel Service Saddle (**tapped repair clamp**).
2. **Smith-Blair 317 Double Stainless Steel Strap (new service taps).**
3. **Smith-Blair 397 Wide Stainless Steel Strap (recommended for PVC).**

4. Mueller 520/530 Servi-Seal Clamp.
5. ROMAC SS1 Tapped Repair Clamp.
6. Ford FCD202-xxx-TAP Dual Band Epoxy Coated Service Saddle (new service taps).
7. Ford FC202-xxx-TAP-Q Double Band Epoxy Coated Service Saddle (new service taps).
8. Ford FS1 Stainless Steel Tapped Repair Clamp.
9. Ford SS1 Tapped Repair Clamp.
10. Cascade CRT1 Stainless Steel Repair Clamp w/ Tapped Outlet.
11. Hymax Versa Stainless Steel Coupling.
12. A.Y. McDonald 435 Series Tapped Repair Clamp.
13. A.Y. McDonald 4855A Ductile Iron Epoxy Coated Double Strap Saddle (new service taps).

704.4 Horizontal Directional Drill Pipe.

704.4.3 Construction:

- (1) Refer to Article 703 and this section.
- (2) Prior to bidding, become familiar with anticipated subsurface and existing field conditions that will affect the location of the bore pits and the lengths and depths of the pipe installation, as well as any equipment, tools and materials required to keep the necessary installation within the limits identified on the drawings.
- (3) The Contract Documents represent the best information available with regard to anticipated field conditions; however, any provisions necessary for encountering hard-rock drilling are to be included and are considered incidental to the installation.
- (4) Exposing existing water mains to verify location is considered incidental to the installation.
- (5) Submit a horizontal directional-drilling plan, sequence of work, and drilling schedule to the Engineer for review prior to commencing work. At a minimum, include:
 1. Detailed site plan drawing which depicts location and size of boring pits and staging areas.
 2. Proposed sequence and schedule of HDD operations.
 3. Method of controlling and monitoring and recording the bore location, accuracy, and depth.
 4. Drilling mud storage, handling and contingency plan.
 5. Any other applicable details regarding how the work will progress and be controlled.

- (6) The Engineer will review the precision of the installed pipe. For gross misalignment, the Engineer reserves the right to require that the pipe be reinstalled at no cost to the City. Maintain liability for all costs associated with modifying to easements due to HDPE installation alignment errors. Pipe installation accuracy requirements:
 1. Horizontal accuracy of +/- 3-feet.
 2. Vertical accuracy of plus 6-inches and minus 3-feet.
- (7) Perform pipe joining with personnel trained by the thermal fusion equipment manufacturer in the use of the equipment for thermal butt fusion/electro-fusion of HDPE pipe.
- (8) Do not proceed with installation of the pipe until mechanical end seals are securely installed.
- (9) The Plastics Pipe Institute does not recommend pneumatic pressure testing of pipe prior to installation. If warranted, or elected to be performed by the Contractor, any pre-installation testing shall be conducted hydrostatically. Hydrostatic testing is preferred because less energy is released if the test section fails catastrophically. Post-installation pressure tests are still required in all cases.
- (10) Do not make ductile iron connections to the fused HDPE adaptors on the same day the HDPE pipe was installed. Allow 24-hours for initial contraction of the HPDE pipe upon removal of the installation pull force loads.
- (11) Install tracer wire along the full length of the pipe. Bring the tracer wire up to finish grade at each end of the bore inside a valve box to allow access for future use. Securely clamp or weld the tracer wire to the valve box. Provide accessible connection point to allow for extension of grounding wire from a locating device. Center the valve box over the mechanical joint transition fitting.

704.6 Furnish & Install Water Valve.

704.6.1 Description:

- (1) Furnish and install water main valves and associated accessories. Work for this item also includes, but is not limited to:
 1. Mechanical joint restraint:
 2. Valve boxes and box extensions.
 3. Valve box adjustments.
 4. Establishing electrical conductivity across the valve.

704.6.2 Materials:

- (1) Refer to Article 702 and this section.
- (2) Valves 12-inches and smaller - Requirements:
 1. Resilient Wedge Gate Valves.

2. Meet requirements of AWWA C509 or AWWA C515 - latest revision.
3. Supplied with mechanical joints.
- ~~4. Supplied with conductive mechanical joint (no lead) gaskets.~~
5. Open to the left.
6. Non-rising stem.
7. O-ring packing.
8. 2-inch square operating nut.
9. Acceptable models include:

Brand	Model
Kennedy	KS-FW 8571, KS-RW 7571 or equal
Mueller	A2360, A2361 or equal
Clow	F-6100 Model 2638, 2639, 2640 or equal
American Flow Control	Series 2500 or equal
American Flow Control	Series 2500 with Alpha Ends (restrained) or equal

(3) Valves **14-inches** and larger - Requirements:

1. Rubber Seated Butterfly Valves.
2. Meets the requirements of AWWA C504 - latest revision.
3. Supplied with mechanical joints.
- ~~4. Supplied with conductive mechanical joint (no lead) gaskets.~~
5. Open to the left.

704.6.3 Construction:

- (3) Set and join valves and associated accessories to the pipe with mechanical joints per Article 703.
- (4) Always install valves in the closed position to prevent foreign material from causing damage.
- (5) Adjust valves following installation so they operate easily and properly.
- (6) Establish conductivity across valves by means of mechanical or field-welded bonding straps and any associated coating repairs per Section 702.3.1 (5) – ‘Electrical Conductivity.’ Bonding straps shall be minimum 2 gauge copper wire capable of transmission of at least 500 amps, or Engineer approved equivalent.

704.7 Furnish and Install Hydrant / Salvage Existing Hydrants.

704.7.1 Description:

- (1) Furnish and install fire hydrants and associated thrust restraints. Adjust hydrant as necessary.
- (2) Prepare a proper drain field for the hydrant.
- (3) Establish electrical conductivity between the hydrant assembly and the distribution system mains.
- (4) Decommission and salvage existing fire hydrants as designated on the plans.
- (5) Restore all disturbed terrace or turf areas.

704.7.3 Construction:

- (10) Install solid concrete or poured concrete thrust blocking against undisturbed soil behind the base of the hydrant in accordance with Article 703 of these Standard Specifications.
- (11) Set the hydrant in a truly vertical position and securely brace it until backfilling is complete.
- (12) Rotate the hydrant so that the small nozzles are parallel to the curb line.
- (13) Establish conductivity to the hydrant barrel by means of mechanical or field-welded bonding straps and any associated coating repairs per Section 702.3.1 (5) – ‘Electrical Conductivity.’ Bonding straps shall be minimum 2 gauge copper wire capable of transmission of at least 500 amps, or Engineer approved equivalent.

704.9 Furnish & Install Water Service Laterals.

704.9.3 Construction:

- (1) Refer to Article 703 and this section.
- (2) New service lateral installations require one singular continuous copper tubing segment to be installed between the corporation stop/bend fitting connection and the curb stop connection. Confirm proposed curb stop location prior to installation to prevent relocation after installation.
- (3) Adequately wrap the corporation stop with polyethylene wrap to prevent debris from entering or impacting the operability of the corporation stop. Extend polyethylene wrap from the corporation stop at least 3-feet along the copper lateral.
- (4) Whenever possible, install the curb stop on the service at a point 8-feet from the property line.
- (5) Install a full-size, unbroken 4-inch x 8-inch x 8-inch solid concrete masonry block, laid flat, in the excavation to provide a firm base for the curb stop.
- (6) Install the curb box vertically over the curb stop so that after the service is backfilled to final grade, a key may be placed on the rod of the curb stop and it may be operated easily.

- (7) Securely wrap the curb box with polyethylene wrap in order to prevent debris from settling near the curb stop.
- (8) Top of curb rod must terminate within 3-feet of finished box height. Any required rod extensions are considered to be incidental to the installation.
- (9) Set curb boxes 1-inch below the finished ground elevation when located in unpaved areas.
- (10) Set curb boxes ¼-inch below finished grade when located in paved areas.
- (11) Unless directed by the Engineer or as otherwise indicated on the approved plans, do not locate curb boxes in curb, sidewalk, driveways, or within 5-feet of the base of trees.
- (12) Install ½-inch expansion joint around curb boxes located in concrete pavement. Install expansion joint filler material in accordance to Section 303.2(d) of these Specifications.
- (13) When backfilling new service lateral trenches place a 2-inch x 4-inch board next to each curb or valve box in the terraces. Ensure that the board is at least 4-feet long, with at least 2-feet buried and 2-feet exposed.

704.17 Furnish and Install Insulation.

704.17.4 Method of Measurement:

- (1) Measured per each 4-FT by 8-FT sheet of insulation effectively installed, or per 8-FT length unit of tubular service insulation effectively installed.

704.17.5 Basis of Payment:

Paid at the contract unit prices under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
70101	FURNISH AND INSTALL INSULATION	EACH

704.27 Furnish and Install Curb Box.

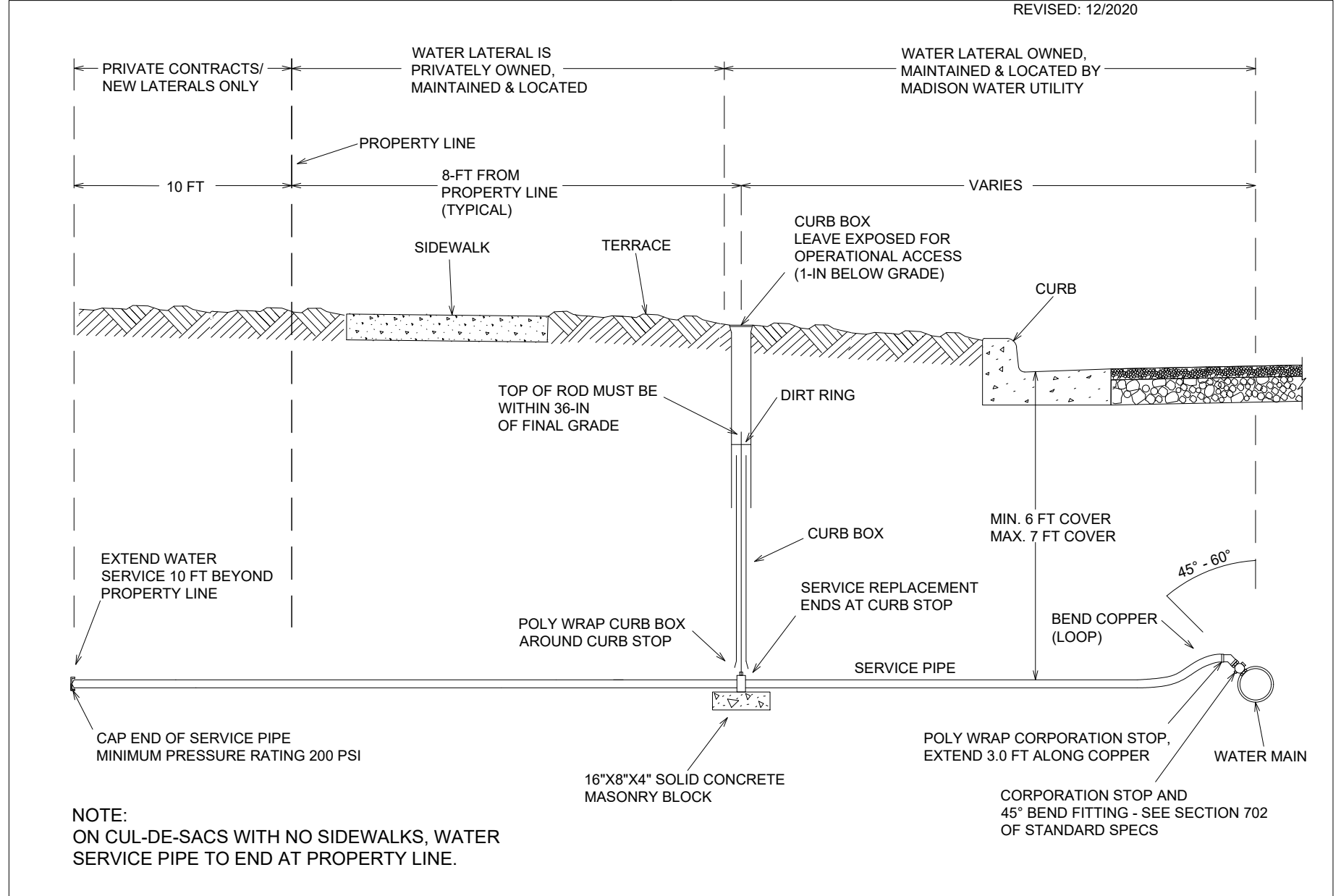
704.27.3 Construction:

- (1) Refer to Article 703 and this section.
- (2) Install the curb box vertically over the curb stop so that after the service is backfilled to final grade, a key may be placed on the rod of the curb stop and it may be operated easily.
- (3) Securely wrap the curb box with polyethylene wrap in order to prevent debris from settling near the curb stop.
- (4) Top of curb rod must terminate within 3-feet of finished box height. Any required rod extensions are considered to be incidental to the installation.

PART VII - WATER MAINS AND SERVICE LATERALS

DETAIL DRAWING NO. 7.10

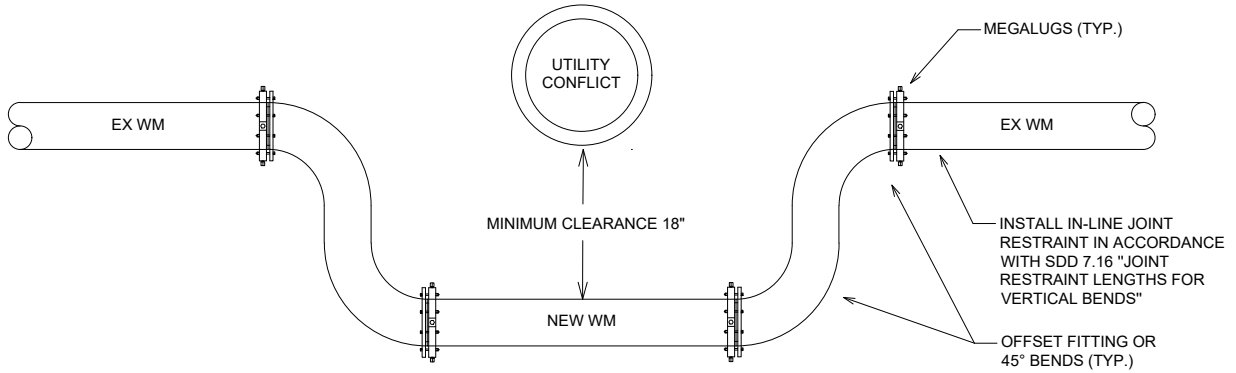
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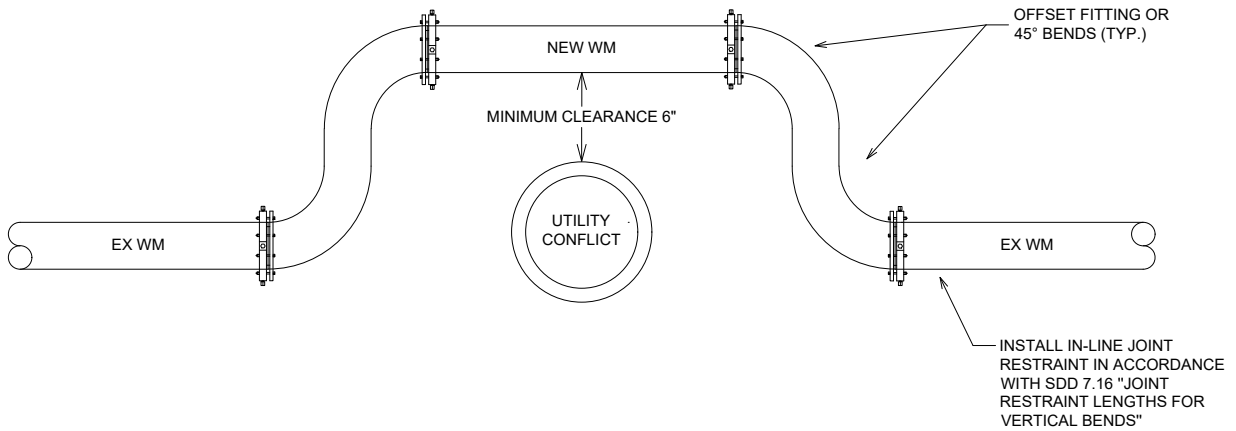
NOTE:
ON CUL-DE-SACS WITH NO SIDEWALKS, WATER SERVICE PIPE TO END AT PROPERTY LINE.

CITY OF MADISON WATER UTILITY	NOT TO SCALE	SERVICE LATERAL INSTALLATION
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**OFFSETTING UNDER UTILITY CONFLICTS
(PREFERRED METHOD)**



**OFFSETTING ABOVE UTILITY CONFLICTS
(ALTERNATE METHOD WITH ENGINEER APPROVAL)**



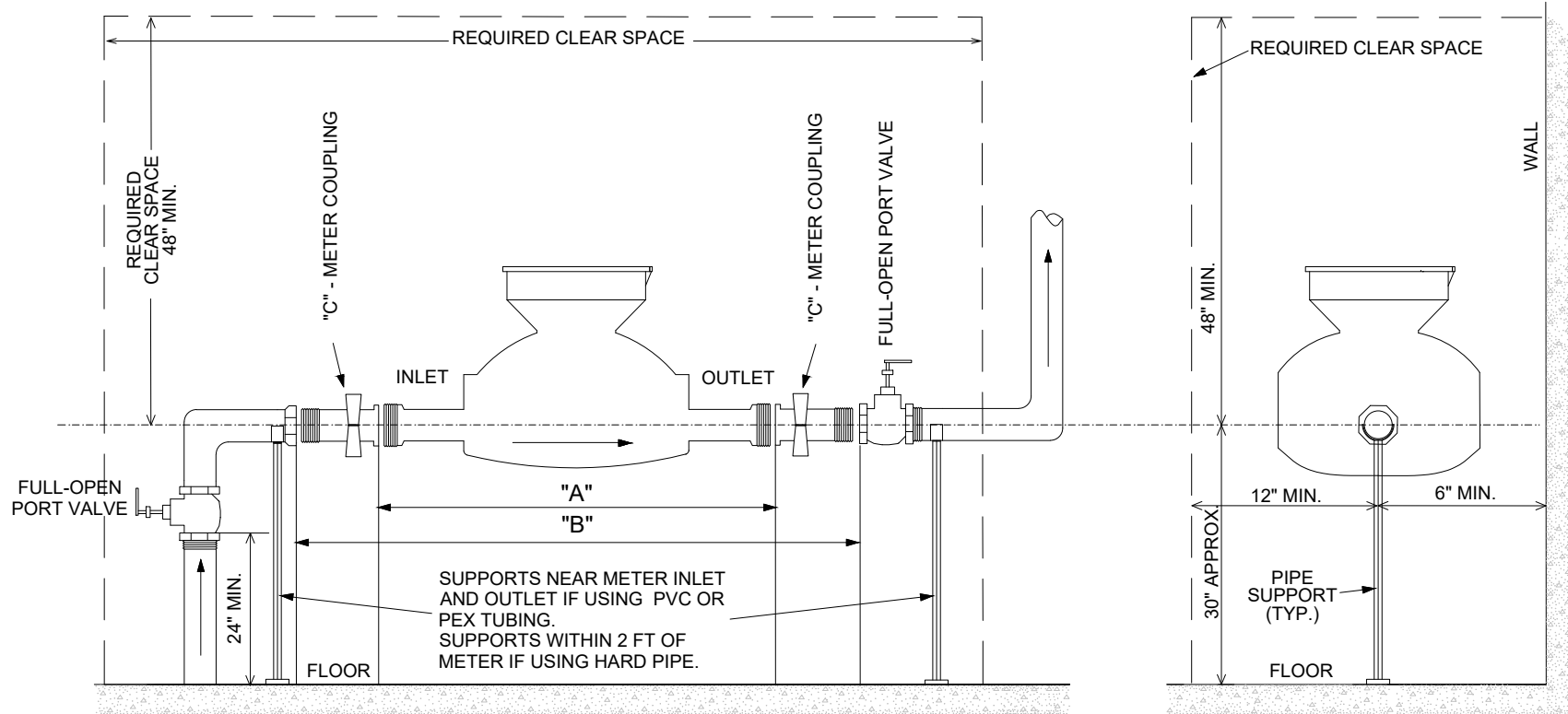
NOTES:

- 1) CLEARANCE SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS, AS INDICATED ON THE CONSTRUCTION DRAWINGS, OR AS OTHERWISE AUTHORIZED BY THE ENGINEER.
- 2) CROSSING BELOW THE EXISTING UTILITY IS THE PREFERRED METHOD, CROSSING ABOVE ONLY WHEN AUTHORIZED BY THE ENGINEER, OR UNDER SPECIAL CIRCUMSTANCES.
- 3) MINIMUM ALLOWABLE CLEARANCE WHEN CROSSING BELOW SANITARY OR STORM SEWERS IS 18-IN.
- 4) IF REQUIRED CLEARANCE CANNOT BE OBTAINED, USE 45° FITTINGS IN LIEU OF OFFSET FITTINGS.
- 5) 11.25°, 22.5°, OR 90° FITTINGS ARE NOT ALLOWED WITHOUT ENGINEER APPROVAL.
- 6) INSULATE AS REQUIRED PER THE STANDARD SPECIFICATIONS OR AS INDICATED ON THE DRAWINGS.
- 7) NEW PIPE SHALL HAVE NO JOINTS BETWEEN FITTINGS.

CITY OF MADISON
WATER UTILITY

NOT TO SCALE

OFFSETTING EXISTING WATER MAIN
OVER/UNDER UTILITY CONFLICTS



"A" - METER LAY LENGTH (BY METER SIZE):
 (DOES NOT INCLUDE GASKET OR COUPLING)
 $\frac{5}{8}$ " = 7 $\frac{1}{2}$ "
 $\frac{3}{4}$ " = 9"
 1" = 10 $\frac{3}{4}$ "

"B" - METER WITH COUPLINGS (BY METER SIZE):
 $\frac{5}{8}$ " = 12 $\frac{1}{4}$ "
 $\frac{3}{4}$ " = 14"
 1" = 16"

"C" - CONTRACTOR TO FURNISH A.Y. MCDONALD MFG CO.,
 STANDARD, NO/LOW-LEAD METER COUPLINGS WITH A WIRE
 HOLE. ITEM # 74620, AND GASKETS, OR APPROVED EQUIVALENT.

- NOTES:
- METER AND ASSOCIATED VALVES SHALL BE LOCATED IN THE SAME ROOM WHERE WATER SERVICE FIRST ENTERS THE BUILDING.
 - METER BYPASS PIPING IS NOT PERMITTED.
 - METER SHALL BE LOCATED WITHIN 36" DOWNSTREAM OF THE INLET VALVE.
 - OUTLET VALVE SHALL BE LOCATED WITHIN 36" DOWNSTREAM OF METER.
 - STACKED METERS SHALL BE SPACED 15" MINIMUM ON CENTER WITH A MAXIMUM HEIGHT OF 60" ON CENTER.
 - ELECTRICAL BONDING SHALL BE CONNECTED OUTSIDE METER COUPLING.
 - PRESSURE REDUCING VALVES, BACK FLOW PREVENTERS, OR CHECK VALVES SHALL BE LOCATED DOWNSTREAM OF THE OUTLET VALVE.
 - ALL METERS SHALL BE SO LOCATED THAT THEY SHALL BE PROTECTED FROM OBSTRUCTIONS AND PERMIT READY ACCESS FOR READING, INSPECTION, AND SERVICING, SUCH LOCATION TO BE DESIGNATED OR APPROVED BY THE WATER UTILITY.
 - FLOOR SUPPORT AND SUPPORT HANGERS ARE WALL TYPE.

CITY OF MADISON WATER UTILITY	NOT TO SCALE	STANDARD 5/8", 3/4", 1" METER INSTALLATION
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