

# **URBANDALE WATER UTILITY**

## **STANDARD SPECIFICATIONS FOR WATER MAIN AND APPURTENANCES**





**Urbandale Water Utility  
Urbandale, Iowa  
August 31, 2022**

URBANDALE WATER UTILITY  
STANDARD SPECIFICATIONS  
FOR  
WATER MAINS AND APPURTENANCES

Project No. W2023-0138



	<p>I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.</p> <p> NEIL WEISS, P.E.</p> <p><u>1/26/2023</u> DATE</p> <p>LICENSE NUMBER P24488 MY LICENSE RENEWAL DATE IS DECEMBER 31, <u>2023</u> PAGES OR SHEETS COVERED BY THIS SEAL: _____</p> <p><u>ALL SHEETS.</u></p>
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URBANDALE, IOWA  
AUGUST 31, 2022

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FOR  
WATER MAINS AND APPURTENANCES

Accepted by the Urbandale Water Board September 15, 2022

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URBANDALE WATER UTILITY  
STANDARD SPECIFICATIONS

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## I. GENERAL REQUIREMENTS

- A. **PURPOSE:** To set forth requirements of performance, standards of materials and construction for the installation of water mains and appurtenances within the City of Urbandale and under the jurisdiction of the Urbandale Water Utility.
- B. **SCOPE:** To ensure that water mains, appurtenances, and the construction thereof are in accordance with the requirements of the City of Urbandale, Urbandale Water Utility and the Water Supply Section of the Environmental Protection Division of the Department of Natural Resources.
- C. **PLANS:** Submit plans of proposed construction for approval and acceptance by the Urbandale Water Utility and the Urbandale Engineering Department. Drawings shall be complete showing locations of water mains, hydrants, valves and miscellaneous appurtenances for the proposed construction. All plans must be certified by an Iowa registered, professional Civil Engineer showing water mains to be constructed and appurtenances connected thereto.
1. Submittal: **Two (2)** sets of plans, size D, (34-inch x 22-inch), horizontal scale 1-inch = 30-feet, vertical scale 1-inch = 5-feet, shall be submitted to the Urbandale City Engineer and **one (1)** sets shall be submitted to the Urbandale Water Utility. Application forms required by the Water Supply Section of the Environmental Protection Division of the Department of Natural Resources shall be submitted to the City Engineer for review and approval. The Water Supply Section of the Environmental Protection Division of the Department of Natural Resources shall not approve plans without approval by the City of Urbandale and Urbandale Water Utility. Combining sanitary sewer plans with water plans is encouraged.
  2. As-built Drawings: One (1) 'as-built record drawing', **in electronic form-pdf**, of the main is to be submitted to the Water Utility within thirty (30) days after the completion of the water main installation, unless otherwise approved by the Distribution Manager. Prior to the acceptance of the public improvements, as-built record drawings, (horizontal and vertical) as-built data in state plane coordinates and NAD 1983 State Plane Iowa South horizontal datum and NAVD 88 vertical datum, adjusted to Urbandale datum for all water piping and associated appurtenances will be provided. Submittals are preferred electronically, but a pdf format is acceptable.
- D. **SPECIAL PROVISIONS:** All material and construction methods to be used which are not in accordance with or in addition to this specification shall have Special Provisions prepared and certified by the Project Engineer.
- E. **SAFETY:** All construction shall be in accordance with applicable Federal, State and local safety regulations. The contractor shall be responsible for implementing safety practices, and the erection and maintenance of barricades, fencing and warning lights, etc.
1. Shoring: Provide shoring, sheeting, and bracing, as required, to protect the work, adjacent property, private or public utilities, and workers.

2. OSHA Requirement: All excavations, which owner's personnel are required to enter, shall comply with OSHA standards.
- F. PROJECT COSTS: Provide detailed costs for appurtenances dedicated to the City, excluding service materials.
- G. MAINTENANCE BOND: Maintenance bond will be required for four (4) years from date of final acceptance of the project by the City. The Contractor shall file said bond, with the Urbandale City Engineer and a copy sent to the Urbandale Water Utility prior to acceptance of the improvements. If a maintenance problem occurs during that time, the contractor shall repair it at his expense. If the contractor shall fail to make repairs, the Water Utility shall have the right to make such repairs and collect the cost of doing the same from the contractor or his bondsman.

# URBANDALE WATER UTILITY

## STANDARD SPECIFICATIONS

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## II. MATERIALS

This section covers materials approved for use in the construction of water mains and related construction. When a required material is not specified herein, the Urbandale City Engineer and Urbandale Water Utility must approve such addition or changes. The approval of a material for a particular use does not constitute the approval of its use for any other purpose.

### A. GENERAL:

1. Pipe and Fittings: Conform to the requirements of American National Standards Institute (ANSI), American Water Works Association (AWWA) and American Society for Testing and Materials (ASTM).
2. Minimum Water Main Diameter: 8-inch unless otherwise directed by the Urbandale Water Utility.
3. Minimum Size Service Line: 1-inch diameter unless otherwise directed by the Urbandale Water Utility.

### B. PIPE MATERIALS:

1. Ductile Iron Pipe (D.I.): AWWA C151, ANSI A21.51 manufactured in accordance with ANSI 21.51; minimum thickness, Class 52.
  - 1a. Enameline pipe using standard cement lining: AWWA C104, ANSI A21.4.
  - 1b. Coat the outside of the pipe with bituminous enamel, 1-mil thickness.
  - 1c. Joints shall be push-on or mechanical in accordance with ANSI A21.15.
  - 1d. Shipment and Storage: For shipment and storage, small pipe shall not be telescoped inside larger pipe. All pipe materials are to be handled by use of slings, hoist, skids or other approved means. Dropping or rolling of pipe materials is not permitted.
  - 1e. Defective or damaged pipe shall be cause for rejection and removal from the site.
  - 1f. Pipe with damage to cement mortar lining will be rejected. Field patching will not be permitted except at the cut ends.
  - 1g. Use restrained or locked pipe joints on ductile iron pipe at stream crossings.
  - 1h. All ductile iron pipe shall be encased in polyethylene encasement material.

2. PVC: Poly Vinyl Chloride Pipe: Poly Vinyl Chloride pipe **16-inch** and smaller shall conform to AWWA C-900 specifications, Pressure Class 235 (DR 18). Poly Vinyl Chloride pipes 20-inch and larger shall conform to AWWA C-905 specifications, (DR-18).
  - 2a. PVC (Poly Vinyl Chloride) water main shall not exceed 20-inch in diameter. (Pipe larger than 20-inch shall be Ductile Iron (DI).
  - 2b. PVC (Poly Vinyl Chloride) pipe shall have cast iron outside diameter.
  - 2c. Pipe joints shall be elastomeric gasket push-on type joints.
  - 2d. Solvent cement joints are strictly prohibited.
  - 2e. Fittings for PVC (Poly Vinyl Chloride) shall be as specified for ductile iron pipe.
3. Locking PVC Pipe: Locking PVC pipe shall meet AWWA C-900 standards for Polyvinyl Chloride pressure pipe and fittings with a dimension ratio of DR18, Certa-Lok, or approved equal.
  - 3a. **The pipe shall be joined using either PVC coupling with beveled edges or Bell with restraining spline. The restraining splines shall be square or rectangular as specified by the manufacturer.**
  - 3b. Exposed splines shall be cut flush to coupling to reduce soil drag.
  - 3c. Couplings shall be beveled on leading degrees to minimize soil friction.
4. **Casing Pipe:**
  - 4a. **Casing pipe shall be a minimum of 6-inch in diameter, greater than the water main, which is being installed.**
  - 4b. **The casing pipe thickness shall be determined by the conditions in the area.**
  - 4c. **All joints in the casing pipe shall be welded to meet ASTM A53 standard.**
  - 4d. **Each 20-foot section of water main shall be fitted within a minimum of two (2) supports per section throughout the casing. The pipe supports shall be Power Seal Casing Chock Model #4810, or approved equal.**
  - 4e. **Minimum 1/8 inch thick manufactured synthetic rubber casing end seal with stainless steel bands and fasteners.**

5. Water Service Pipes and Private Mains

- 5a. The minimum size service lines shall be 1-inch unless otherwise directed by the Urbandale Water Utility.
- 5b. One-inch thru 2-inch diameter: Type K (Heavy), soft annealed copper, seamless ASTM B88, Pex-A 200 psi pipe meeting AWWA C-904 specifications or Yelomine, Certa-Lok pipe, SDR 17, 250 psi pipe.
- 5c. Pipes larger than 2-inch shall be DI, cement-mortar lined, ANSI A21.50, Class 52 mechanical or push joint, or poly vinyl chloride (PVC), push joint, AWWA C-900 specification, Pressure Class 235 (DR-18) with cast iron outside diameter.

C. FITTINGS

- 1. Fittings: Fittings for 3-inch thru 20-inch size ductile iron pipe shall be compact iron per AWWA C153, ANSI A21.53, or gray cast iron, or full size ductile iron per AWWA C110, ANSI A21.10. The pressure rating for gray cast iron fittings shall be 350-psi (pounds per square inch) for 3-inch thru 24-inch mains and 250-psi (pounds per square inch) for fittings greater than 24-inch, Tyler, or approved equal.
- 2. Mechanical Joint: Fittings shall be mechanical joint.
- 3. Lining: All fittings shall be furnished with cement mortar lining of standard thickness and given a seal coat of bituminous enamel per AWWA C104, ANSI A21.4.
- 4. Fitting Joints: Provide restrained or locked joints on all fittings.
- 5. Anchoring Tee: Short short body (SSB) Class 350, Tyler Union, or approved equal.
- 6. Anchoring Pipe: Short short body (SSB) Class 350, Tyler Union, or approved equal.
- 7. Anchoring Coupling: Short body (SSB) Class 350, Tyler Union, or approved equal.
- 8. Glands:
  - 8a. Ductile Iron: EBAA Iron Megalug Series 1100, Stargrip Series 3000 with star bond coating or approved equal.
  - 8b. PVC: Megalug Series EBAA Iron Series 2000PV, Stargrip Series 4000 with star bond coating or approved equal.

9. Cap: Short body (SSB) Class 350, **Tyler Union**, or approved equal.
10. Plug: Short body (SSB) Class 350, **Tyler Union**, or approved equal.
11. Anchoring Rods and Eye Bolts:  $\frac{3}{4}$ -inch diameter stainless steel or high strength low alloy steel to be used only with the prior approval of the Urbandale Water Utility.
12. Couplings: Romac Macra Smith Blair 421 Top Bolt, or approved equal.
13. Solid Sleeves: **Tyler Union** mechanical joint, or approved equal.

D. VALVES:

1. General:
  - 1a. Valves shall be of a type permitting repacking under pressure when wide open.
  - 1b. Provide special tools required for disassembling and repacking valves.
  - 1c. Must be coated both inside and out with a protective epoxy coating that meets or exceeds AWWA C550 and certified to ANSI 61.
  - 1d. Each valve shall have the name of the manufacturer and the year when cast on the body with raised letters.
  - 1e. Bolts and hex nuts used on the bonnet of the valve shall be stainless steel.
  - 1f. Valves shall have mechanical joint ends, AWWA C111, ANSI A21.11.
  - 1g. Glands:
    - 1) **Ductile Iron: EBAA Iron Megalug Series 1100, Stargrip Series 3000 with star bond coating or approved equal.**
    - 2) **PVC: EBAA Iron Megalug Series 2000PV, Stargrip Series 4000 with star bond coating or approved equal.**
2. Gate Valves:
  - 2a. All 20-inch and smaller valves shall be a resilient wedge gate and conform to AWWA C509, or AWWA C515 and be manufactured by Mueller, Clow, or American Flow Control.
  - 2b. Non-rising stem with 2-inch operating nut; open counter clockwise direction (left).
  - 2c. O-ring seals, 200 psi working pressure.

- 2d. Ductile Iron Body, American Flow Control Series 2500, or approved equal.
3. Butterfly Valves:
  - 3a. Installation of butterfly valves must be approved by the Water Utility.
  - 3b. Butterfly valves shall conform to AWWA C504, Class 150B.
  - 3c. Valves shall be equipped with Ni-resist discs.
  - 3d. Valves shall have O-ring seals and stainless steel shaft.
  - 3e. Valves and operators shall be for buried service.
  - 3f. Equipped with a 2-inch x 2-inch operating nut and a lifetime grease pack and shall open in the counter clockwise direction (left).
  - 3g. Certified shop test reports shall accompany each valve.
4. Tapping Valve and Sleeves:
  - 4a. American Flow Control Series 2500 MJ valve, or approved equal.
  - 4b. Smith-Blair Model 665 Sleeve, Ford FTSS, or approved equal. The tapping sleeve constructed entirely of stainless steel including stainless steel MJ adapter.
5. Cutting In Valves and Sleeves:
  - 5a. American Flow Control Series 2500 MJ valve cutting in valve and cutting in sleeve, or approved equal. Use when directed by the Urbandale Water Utility.
6. Valve Boxes:
  - 6a. All valve boxes shall be domestic cast iron screw type adjustable with cast iron, stay-put covers marked "Water". Inside diameter of valve box is to be a minimum of 5 1/8-inch. This shall be Tyler Series 6850, Model 666S and cover.
  - 6b. Valve Box Adaptor II by Adaptor, Inc., (alignment centering ring) shall be required to position the valve box and for proper alignment of the valve box. The valve box adaptor II shall also be the proper type (A, B, C, etc.) to fit the various valve manufacturers.

7. **Valve Box Extensions:**

7a. Extensions shall be Tyler Model 60, 69 or 69A. Drop in extensions shall not be allowed.

8. **Valve Stem Extension:**

8a. When the nut of the valve is deeper than 6-feet a valve stem extension is required. The valve stem extension shall be solid steel, with no couplings.

E. SERVICE LINES

1. **Material:** All service pipes through 2" diameter shall be type 'K' heavy, soft annealed copper, seamless ASTM B88 or Pex-A, 200 psi pipe meeting AWWA C-904 specifications or Yelomine Certa-Lok pipe, SDR 17, 250psi pipe. Pex-A and Yelomine applications can only be used as outlined in the Utility's Rules and Regulations in Section 105.4.1.1. All material shall comply with AWWA C800 and ANSI/NSF 61.

2. Valves: Use gate valve in lieu of curb stop for service lines larger than 2-inch.

3. Minimum size: 1-inch unless directed by the Urbandale Water Utility.

4. Flared Fittings: For 1-inch thru 2-inch services.

4a. **Corporation Stops:** Shall be Ford FB600, or approved equal.

4b. **Curb Stops:** Shall be Ford Ball Valve B22, 90-degree turn for flared copper services, or approved equal.

4c. **Coupling:** Shall be Ford C22, or approved equal.

5. Compression Fittings: For 1-inch thru 2-inch services.

5a. **Corporation Cocks:** Shall be Ford FB1000 series or approved equal.

5b. **Curb Stops:** Shall be Ford B44 series, or approved equal.

5c. **Coupling:** Shall be Ford C44 series, or approved equal.

6. **Water Service Saddles:** Service saddles shall be single band, stainless steel. Ford Style FS313 on 4-inch to 12-inch pipe, Ford Style FS323 or Smith Blair 372, or approved equal, for pipe 16-inch and larger.

6a. Saddles will be used for corporation cocks.

7. Curb Stop Boxes:

- 7a. Body: 1-inch inside diameter steel pipe. Metal curb box, sliding extension type, arch pattern base with stationary rod, A.Y. McDonald 5607 for 1-inch and A.Y. McDonald 5603 for 1 ½-inch and 2-inch, or approved equal. When an extension is required, red Loctite shall be applied to the connecting threads
- 7b. Rod: Stationary rod shall be stainless steel. Stainless steel rod shall be minimum 12-inch to maximum 24-inch below the ground level. Self-centering in the box. Top end of rod shall be blade shaped with thickness appropriate for operation using a stationary rod key.
- 7c. Lid: A.Y. McDonald 5607-L, or approved equal. This lid has a 1-inch pentagon plug.

F. BLOWOFFS:

1. Temporary

- 1a. Temporary blowoffs shall only be used on water designed to be Extended.
- 1b. Blowoffs are to be sized accordingly to provide at least 3.0 feet per second water flow from the main for disinfection purposes.
- 1c. For blowoffs smaller than 6-inch in diameter and smaller, the blow-off shall be Kupferle Eclipse #2, or approved equal, or provide a minimum 2” diameter curb stop, stop box and riser.
- 1d. For mains 8-inch and larger, hydrants shall conform to AWWA C502, break-flange hydrant, Waterous Model WB 67-250 Pacer, or approved equal.

2. Permanent

- 2a. Blowoffs are to be sized accordingly to provide at least 3.0 feet per second water flow from the main for disinfection purposes.
- 2b. Blowoffs for mains smaller than 6-inch in diameter, the blowoff shall be Kupferle Eclipse #2, or approved equal.
- 2c. Blowoffs on mains 6-inch and larger, hydrants shall conform to AWWA C502, break flange hydrant, Waterous Model WB 67-250 pacer, or approved equal.
- 2d. Riser pipes will not be allowed.



G. HYDRANTS:

1. General:

- 1a. Hydrants shall conform to AWWA C502, break-flange hydrant, Waterous Company Model WB 67-250 Pacer, or approved equal.
- 1b. Coat interior and exterior of hydrants, except exterior above grade mark, with two coats of asphalt varnish per AWWA C502; paint the exterior of hydrant above grade mark with one coat primer and finish paint of Highway Yellow.
- 1c. Provide two (2) 2 ½-inch hose nozzles and one (1) 5-inch STORZ pumper nozzle; O-ring packing, 6-feet 6-inch depth of bury.
- 1d. Nozzles shall be threaded, or pinned into the barrel. No leaded connection allowed.
- 1e. Nozzle Threads: National Standard.
- 1f. Provide 6-inch mechanical joint inlet and 5 ¼-inch main valve unless otherwise directed.
- 1g. Cap and operating nut shall be Type C. The valve shall open counter clockwise direction (left).
- 1h. The break flange of hydrant shall be 4-inches to 8-inches above grade.
- 1i. Auxiliary Valve: Use gate valve and valve box as specified for gate valve.

2. Hydrant Flags:

- 2a. Hydrant flags shall be 4-feet to 5-feet tall and attach to the bonnet of the hydrant. The shaft shall be made of fiberglass coated with a protective formula that prevents the ultraviolet rays from reaching the resin fibers. Displayed on the shaft will be a minimum of four strips of high-intensity reflective tape. Each strip shall be a minimum of 4-inches in width. The shaft shall be attached at the base with a spring to allow the operation of the hydrant without removal.

H. BOLTING MATERIAL:

- 1. T-bolts shall be manufactured of ASTM A588 steel, with blue fluoropolymer coating.

I. CORROSION CONTROL:

1. Polyethylene Encasement Material: The polyethylene encasement shall be 8-mil minimum thickness polyethylene tube manufactured in accordance with AWWA C105, ANSI A21.5.
2. Polyethylene Encasement Requirement: All cast iron, or ductile iron mains, fittings, valves and hydrants shall be polyethylene encased.
  - 2a. Polyethylene tube encasement shall be used on water main. See Standard Drawing 'A' for proper installation procedures.
  - 2b. Polyethylene pressure sensitive pipe wrapping tape shall be 2-inch wide by 10-mil thick.
3. Polyethylene Tube Size Requirements: For Water Main:

Normal Pipe Diameter inches	Minimum Polyethylene Flat Tube Width inches
4	16
6	20
8	24
10	27
12	30
14	34
16	37

J. TRACER SYSTEM:

1. Tracer Wire: Shall be No. 12 AWG high-strength copper clad steel (HS-CCS), color blue, manufactured by Copperhead industries, or approved equal.
2. Splicing Material: Underground wire splices shall be protected against deterioration/corrosion using Dryconn Direct Bury Lug, Part #3WB-01.
3. Tracing Wire Receptacles: Provide TW-18 tracing wire receptacles, or approved equal at all hydrants.
4. Anode Ground Rod: 1# x 1.315" D x 18.5"L, magnesium drive in anode manufacturer by Copperhead Industries, or approved equal. Cap installed on one end of anode ground rod to be HDPE. Provide a beveled pointed end on anode ground rod opposite of the cap to aid in hammering into the ground. **Required at termination points of the tracing system, including temporary blowoff hydrants.**

K. THRUST BLOCKS:

1. Requirement: Provide concrete thrust blocks where piping changes direction, dead-ends, and at the hydrants.
2. Location: Carry thrust block to undisturbed edge of trench for bearing.
3. Thickness: Minimum thickness of thrust blocks: 18-inch, or 1.5 times the outside diameter of the pipe, whichever is greater.
4. Bearing Area: Bearing area of thrust blocks, S.F.:

Pipe Size (inches)	90 Degree Bend	45 Degree Bend	11 ¼ & 22 ½ Degree Bend	Tee or Dead-end
4	3	1	2	1
6	6	3	2	4
8	11	6	3	8
10	17	9	5	12
12	24	13	7	17
14	33	18	9	23
16	43	23	12	31

5. Refer to Concrete Thrust Block Standard Drawing 'B' for the general arrangement of thrust blocks. Also refer to Concrete Gravity Block Standard Drawing 'C' for volume of gravity blocks as needed. Place plywood between fittings and thrust block. No bolts shall come into contact with the concrete thrust block. A sheet of plastic shall be wrapped around the pipe including the bolt circle before the concrete is placed.

L. CONCRETE:

1. Materials:
  - 1a. Iowa DOT Class C concrete.
  - 1b. Concrete shall have a compressive strength of 4000-psi at 28 days.

URBANDALE WATER UTILITY

STANDARD SPECIFICATIONS

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### III. EXCAVATION AND BACKFILL

#### A. TRENCH EXCAVATION

1. Trench Width: Keep trench width as narrow as possible and still provide adequate room for backfill and jointing.
2. Maximum Width: Maximum width trench on top of pipe: 2 times pipe diameter, or 2-feet; whichever is greater.
3. Trench Walls: Maintain vertical walls of excavation below top of the pipe.
4. Shoring: Provide sheeting, shoring and bracing where required to hold the walls of excavation, to protect existing structures and utilities, and provide safety for workers.
5. Bottom of Trench:
  - 5a. Hand shape to provide a uniform bearing and support for full length of the pipe barrel against undisturbed earth.
  - 5b. Provide suitable bell holes at each pipe joint after the bottom of the trench has been graded.
  - 5c. Remove large clods, stones and other foreign material from the bottom of the trench.
6. Unstable Material: When unstable material is encountered which may not provide a suitable foundation for pipe, remove the unstable material and replace with stabilizing material.
  - 6a. Place pipe bedding on top of stabilizing material.
7. Rock and Rubble Excavation:
  - 7a. If trench bottom is extremely hard, or is in rock, or rubble where there is possibility of pipe being subjected to point contact:
    - 7a1. Over excavate trench bottom 6-inch minimum below grade and backfill with pipe bedding material.
8. Bedding Material:
  - 8a. Normal bedding for water main in dry trench conditions shall consist of natural soil found in the trench bottom. The contractor may elect to use sand or gravel.
  - 8b. For wet trench conditions, crushed stone or gravel cannot exceed 1-inch diameter and shall be used as normal bedding.

- 8c. When, in the opinion of the inspector, the trench bottom is such that 1-inch diameter stone or gravel cannot provide a proper foundation for the pipe, the aggregate used shall be either crushed limestone or crushed gravel with a maximum size no greater than 2-inch.
- 8d. Use sand or gravel around corporation cocks to prevent stress on main or service line.

B. TRENCH BACKFILL

- 1. Backfill Timing: Backfill trench immediately after the location of connections and appurtenance have been recorded.
- 2. Unsuitable Material: Do not use large stones, large clods, organic matter, concrete, rubbish, and frozen or unsuitable materials in backfill.
- 3. Right-of-Way and Street Crossing Backfill:  
  
Carefully hand tamp select material to 1-foot above top of pipe. Backfill remaining trench with excavated material to at least 95% maximum density – Standard Proctor Method. Maximum lift shall be 2-feet, except at street locations or other areas as directed.
- 4. Soil Testing
  - 4a. Field tests for density and moisture content shall be performed by the Soils Engineer, defined in Urban Standard Specifications, to ensure that the specified density is being obtained. Testing shall be done using ASTM D2922 nuclear methods or another method approved by the Engineer.
  - 4b. Density tests shall be taken at 1-foot and 3-feet below finished grade, and as directed by the Engineer or the Utility's representative under special conditions. Tests locations shall be selected by the Engineer or the Utility's representative immediately prior to performing the tests. The Contractor shall excavate, as directed by the Engineer, for tests at intermediate depths. As a minimum, density tests shall be taken at approximately 200-foot intervals along the trench. Additional tests shall be required at the following locations:
    - 4b1. Over jacking pits where the casing was installed.
    - 4b2. Immediately adjacent to all structures.
  - 4c. The contractor will be responsible for compaction testing and payment for testing unless otherwise specified in the contract documents.
  - 4d. Work shall not progress until all required compaction testing reports are received and approved by the Urbandale Water Utility.

C. EROSION CONTROL

1. Provide construction practices to minimize soil erosion and control water pollution. Prevent the eroded soil from leaving the construction site and from entering onto adjacent property or waterways.
2. Install and maintain slope protection, slope stabilization and erosion control devices.

# URBANDALE WATER UTILITY

## STANDARD SPECIFICATIONS

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#### IV. INSTALLATION AND DESIGN

The purpose of this section is to provide information regarding design and installation of a water distribution system extension, which is acceptable to the Urbandale Water Utility.

##### A. WATER MAINS

1. Taps: The Urbandale Water Utility shall make all taps **through 12”** for water main extension. See Excavation Detail for Tapping Sleeve Standard Drawing ‘D’. All tapping sleeves shall be air pressure tested prior to tapping the main.
2. Main Size: Reference AWWA C605 (Underground Installation of PVC Pressure Pipe) for all PVC water main installations. All water mains shall be sized large enough to provide domestic, irrigation, and fire protection flows to the area requesting service. The minimum water main size shall be 8-inches in diameter, unless otherwise approved by the Urbandale Water Utility. The Urbandale Water Utility reserves the right to size mains adequately to supply future needs.
3. Pipe Depth and Location: Lay pipe in the dry; 5-feet 6-inch earth cover except where otherwise directed by the Urbandale Water Utility. Install water main and appurtenances in accordance with AWWA C-600. Locate water main 3-feet back of curb line of existing or proposed pavement.
4. Cleaning: Clean the pipe interior of foreign material before lowering into the trench. Keep clean at all times by securely closing open ends of pipe and fittings.
  - 4a. Use minimum amounts of gasket lubricant; apply to gasket only. Do not apply to inside of the bell.
  - 4b. The pipe shall not be laid in water, nor shall water be allowed to rise in the trench around the pipe.
5. Laying: Place the pipe in a trench in sound, undamaged condition. Do not injure pipe coating or lining. Use web slings to install or move the pipe. Use of end hooks or dropping of the pipe barrel is prohibited.
  - 5a. No blocking of the pipe shall be allowed. Uniform bearing along the full length of the pipe barrel shall be maintained at all times.
6. Cutting: Cut pipe in a neat and workmanlike manner without damage to pipe. Smooth and bevel cut ends of push-on type pipe to prevent gasket damage.
7. Pipe Deflection: Deflect pipe joints as required in accordance with recommendations of pipe manufacturers. If deflection exceeds manufacturers’ recommendation, use suitable fittings with ductile iron retainer glands and thrust blocks to secure fittings.
8. Cover Pipe Ends: Cover ends of the pipe with watertight plug or cap when pipe laying is not in progress.

9. Polyethylene Encasement: All ductile iron pipes shall be wrapped in polyethylene encasement material in accordance with AWWA C-105, ANSI A21.5 as shown on the Polyethylene Wrap Detail Standard Drawing 'A'.
10. Looping: Dead-ends shall be minimized by looping whenever possible.
11. Dead-Ends: Dead-ends shall terminate with a hydrant or approved flushing device.
12. Flow Rate: In no case shall a hydrant be placed on a main, which has less than 500-gpm flowrate at 20-psi residual and/or less than 6-inches in diameter.
13. Termination: Extend water main to the furthest boundary of the plat, site plan, or property, or as directed by the Urbandale Water Utility.
14. Future Connections: Plug or cap all pipe ends or fittings left for future connections; construct concrete thrust blocks as shown on Concrete Thrust Block Standard Drawing 'B'.
15. Direction Change: Provide concrete thrust blocks at all fittings, at dead-ends and at alternate pipe joints where pipe joints are deflected to accommodate small changes in pipe direction.
16. Downward and Vertical Bends: Provide restrained or locked joints on fittings and pipe joints adjacent to downward and vertical bends; thrust blocks may be required; contact Urbandale Water Utility for criteria.
17. Horizontal Separation of Water Mains from Gravity Sanitary and Combined Sewers:
  - 17a. Water mains shall be separated from gravity sanitary and combined sewer mains by a horizontal distance of at least ten feet measured edge to edge unless the bottom of the water main is at least 18 inches above the top of the sewer, and either:
    - 17a1. The water main is placed in a separate trench, or
    - 17a2. The water main is located on a bench of undisturbed earth at a minimum horizontal separation of three feet from the sewer.
    - 17a3. If it is not possible to obtain horizontal separation of three feet and a vertical separation of 18 inches between the bottom of the water main and the top of the sewer, a linear separation of at least two feet shall be provided, and one of the following shall be utilized:
      - 17a3a. The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or

17a3b. The sewer shall be constructed of water main materials.

17a4. The separation distance between the water main and the sewer shall be the maximum feasible in all cases.

18. Horizontal Separation of Water Mains from Sanitary Sewer Force Mains

18a. Water mains shall be separated from sanitary sewer force mains by a horizontal distance of at least ten feet measured edge to edge unless the sanitary sewer force main is constructed of water main materials and the water main is laid at least four feet horizontally from the sanitary sewer force main.

18b. The separation distance between the water main and the sanitary sewer force main shall be the maximum feasible in all cases.

19. Vertical Separation of Water Mains from Sanitary and Combined Sewer Crossovers

19a. Vertical separation of water mains crossing over any sanitary or combined sewers shall be at least 18 inches when measured from the bottom of the water main and the top of the sewer.

19b. If it is not possible to maintain the required vertical separation, one of the following shall be utilized:

19b1. The bottom of the water main shall not be placed closer than six inches above the top of a sewer or;

19b2. The top of the water main shall not be placed closer than 18 inches below the bottom of a sewer.

19c. When a water main crosses below or less than 18 inches above a sanitary or combined sewer, one of the following shall be utilized within ten feet measured edge to edge horizontally, centered on the crossing:

19c1. The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight ends, or

19c2. Sewer pipe of water main material shall be installed.

19d. The separation distance shall be the maximum feasible in all cases.

19e. Wherever a water main crosses a sanitary or combined sewer, the water main and sanitary or combined sewer pipes must be adequately supported. A low permeability soil shall be used for backfill material within ten feet of the point of crossing along the water main.

- 19f. The separation distance between the water main and the sewer shall be the maximum feasible in all cases.
- 20. Horizontal separation of Water Mains from Sanitary and Combined Sewer Manholes
  - 20a. No water pipe shall pass through or come in contact with any part of a sanitary or combined sewer manhole.
  - 20b. A minimum horizontal separation of three feet shall be maintained.
- 21. Horizontal Separation of water mains from Gravity Storm Sewers
  - 21a. Water mains shall be separated horizontally from gravity storm sewer by at least ten feet measured edge to edge.
  - 21b. If it is not possible to maintain the required horizontal separation of ten feet, a minimum of three feet of separation shall be maintained and one of the following shall be utilized within ten feet measured edge to edge:
    - 21b1. The water main shall be constructed of ductile iron pipe with gaskets impermeable to hydrocarbons, or
    - 21b2. The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or
    - 21b3. Storm sewer pipe of water main material shall be installed, or
    - 21b4. Reinforced concrete pipe storm sewers shall be constructed with gaskets manufactured in accordance with ASTM C443.
    - 20b5. The separation distance between the water main and the sewer shall be the maximum feasible in all cases.
- 22. Vertical Separation of Water Mains from Storm Sewer Crossovers
  - 22a. Water mains shall be vertically separated from storms by at least 18 inches between the outside edges of the water main and the storm sewer.
  - 22b. The separation distance shall be the maximum feasible in all cases.
  - 22c. In all cases where a water main crosses a storm sewer, the water main and storm sewer pipes must be adequately supported.
  - 22d. A low permeability soil shall be used for backfill material within ten feet of the point of crossing along the water main.
  - 22e. If it is not possible to obtain 18 inches of vertical separation where the water main crosses above a storm sewer, a minimum of 6 inches vertical

separation shall be maintained and one of the following shall be utilized within ten feet measured edge to edge horizontally, centered on the crossing:

22e1. The water main shall be constructed of ductile iron pipe with gaskets impermeable to hydrocarbons, or

22e2. The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or

22e3. Storm sewer pipe of water main material shall be installed, or

22e4. Reinforced concrete pipe storm sewers shall be constructed with gaskets manufactured in accordance with ASTM C443.

22f. The separation distance between the water main and the sewer shall be the maximum feasible in all cases.

### 23. Separation of Water Mains and Underground Fuel Storage Containers

All new waterlines installed within 200' of an underground fuel storage container shall be copper for 2" and smaller, above 2" shall be ductile iron pipe with nitrile gaskets.

## B. VALVES

1. Location: When the water main is installed in proposed street right-of-way, install valves at street intersections as shown on Water Main and Valve Location Detail Standard Drawing 'E'. Isolate pipe serving each block.
2. Placement: When the water main is installed in other locations, install valves to isolate no more than 800 linear feet of water main in residential areas and 400 linear feet in industrial or commercial areas.
3. Valve Box Adaptor: Install the valve with valve box adaptor to ensure the stem is centered in the valve box. Carefully compact backfill around valve box to required grade.
4. Valving Main Termination Ends: Where construction terminates, the main will be valved 20-feet before the terminating point. At the terminating point, a plug, blow-off valve, and thrust block shall be installed.
5. Polyethylene Encasement: All valves shall be wrapped in polyethylene encasement material.
6. Valve Stem: Use one solid appropriately sized valve stem extension when the nut is deeper than 6-feet. Valve stem extensions shall be securely fastened to the valve nut.

### C. HYDRANTS

1. Placement: A hydrant shall be placed at each street intersection and equally spaced between intersections. Maximum hydrant spacing shall be 500 linear feet. A hydrant shall be placed at the end of each cul-de-sac.
2. Valved: Each hydrant is to be independently valved.
3. Anchoring: Install hydrants using anchoring tee, anchoring coupling or pipe with megalugs and other appurtenances as required. Anchoring rods and eyebolts may be used in lieu of anchoring pipe or anchoring coupling, only with permission of the Water Utility.
4. Hydrant Drains: Hydrant drains shall not be connected to or located within 10-feet of sanitary sewer and storm drains. The hydrant drain port shall be plugged prior to installation in areas where water rises and where the existing soil will not provide adequate drainage.
5. Elevations: Install plumb. Set at elevations so that the flange is at a minimum of 4-inches and no more than 8-inches above the finished grade line.
6. Foundation: Set on concrete foundations.
7. Backfill: Provide one (1) cubic yard of ½-inch river rock at each hydrant.
8. Operation: Tighten all valves and nuts, and operate hydrant to assure all parts are in working condition.
9. Blocking: Hydrants shall be blocked as shown on Hydrant Standard Detail Drawing 'F'.
10. Compaction: Carefully compact backfill around hydrant to required grade.
11. Hydrant Flags: Hydrant Flags shall be provided at every dead-end hydrant, ie. cul-de-sacs, permanent dead-end mains.

### D. SERVICE LINES

1. Taps: Urbandale Water Utility will make all taps to a public or private water main unless otherwise directed by the Urbandale Water Utility.
2. Spacing: No tap shall be made closer than 18-inch from an existing tap or pipe joint.
3. Pipe Length: All new copper service lines shall be one continuous pipe from the corporation cock to the curb stop for services shorter than 100-feet.



4. Tap Angle: 1-inch service line tap shall be made at a 45-degree angle in the water main. See Detail of 1-inch Copper Service Installation Standard Drawing 'G'. Taps 1-½ inch thru 2-inch shall be made at a 90-degree angle as shown on Detail of 1-½-inch or 2-inch Service Installation Standard Drawing 'H'. Curb stop shall have a minimum depth of 5-feet 0-inches and a maximum depth of 7-feet 0-inches.
5. Backfill: Use sand or gravel around corporation cocks to prevent stress on water main and service lines.
6. Minimum Size: Minimum service line shall be 1-inch unless otherwise directed by the Urbandale Water Utility.
7. Curb Stop Placement: Curb stop shall be placed 1-6 feet from the property line in public right-of-way, **in the sidewalk**. See Adjusting Stop Box to New Grade Standard (Arch Pattern Box) Drawing 'I'.
8. Curb Box Marker: Mark location of curb with a post painted blue; extend top of post a minimum of 3-feet above ground.

E. SURFACE WATER CROSSINGS

1. Above-water crossings
  - 1a. The pipe shall be adequately supported and anchored, protected from vandalism, damage and freezing, and accessible for repair or replacement.
2. Underwater crossings
  - 2a. A minimum cover of **5-1/2**-feet shall be provided unless otherwise approved by the Water Utility. When crossing water courses which are greater than 15 feet in width, the following shall be provided:
    - 2a1. **The pipe shall be of a special construction, having flexible, restrained joints and be constructed of Locking PVC or Ductile Iron pipe.**
    - 2a2. Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible, and not subject to flooding.
    - 2a3. Water main shall be securely anchored to prevent movement of the pipe.
    - 2a4. **Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples on each side of the valve closest to the supply source.**

F. TESTS

1. Test Expense: Perform required tests at contractor's expense.
2. Pressure Test & Leakage: Water mains shall be tested for leakage in accordance with AWWA C-600 for a two-hour period.
3. Air Removal: Flush out main before test to remove air. Insert taps to release trapped air.
4. Flushing: Additional flushing may be charged back to the contractor at the Water Utility's discretion.
5. Test Pressure: Test pressure shall be 150-psi.
6. Water Pumped for Testing: Water pumped during test to maintain pressure shall be pumped from a tank or drum so quantities pumped can be accurately measured.
7. Allowable Leakage: Testing allowance (makeup water) (L) in gallons per hour shall be in accordance with the following:

$$L = \frac{SD \times P^{1/2} \text{ power}}{148,000}$$

S = length of pipe tested, in feet

D = Pipe diameter in inches

P = Average test pressure psi (pounds per square inch).

8. Pipe Replacement: Examine trench for leakage during the test. Replace all defective pipe and fittings that do not pass leakage test. Repeat test until requirements have been met and approved by the inspector.
9. Corporation Cocks: After testing is completed, remove corporation cocks if not used for water service connections and install brass plugs.
10. Tapping Sleeve Hydraulic Test: All tapping sleeves shall be hydraulic pressure tested by the contractor prior to tapping the main.

G. DISINFECTION

1. General: Following satisfactory pressure tests, in accordance with the current revision of AWWA Standard C651, all service mains shall be disinfected, sampled and tested as follows:
  - 1a. The form of chlorine used and procedures for disinfection shall be as outlined in AWWA Standard C651. Disinfect by injecting a solution of calcium hypochlorite and water at a slow rate to provide minimum residual chlorine content of 50-ppm (parts per million) in the water main; allow system to stand full of solution for 24 hours. A minimum free residual chlorine concentration of 10 mg/l at end of test period.

- 1b. Maintained for the 24-hour disinfection period. The plumbing contractor will supply the chlorine for disinfection purposes and this is to be considered incidental to the project.
- 1c. After the 24-hour disinfection period, the service main shall be flushed to remove the chlorine. The Water Utility shall be notified when the flushing of the water main is scheduled.
- 1d. Water used for flushing and sampling shall be provided by the Water Utility for the first test of the main. If the first test samples do not pass laboratory tests, any labor and equipment costs incurred by the Water Utility for further disinfection, flushing and sampling shall be billed to the contractor (see Appendix A – Fee Schedule A-4).
- 1e. After final flushing, two (2) consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main. At least one set of samples shall be collected from every 1,000 feet of the new water main, plus one set from the end of the line and at least one set from each branch. All samples shall be tested for bacteriological (chemical and physical) quality in accordance with Standard Methods for the Examination of Water and Wastewater; and shall show the absence of coliform organisms; and, if required, the presence of a chlorine residual.
- 1f. All samples shall be taken within 21 days of the water main installation.
- 1g. Contractor shall follow the AWWA standard for water dechlorination so not to discharge super-chlorinated water from the disinfection test into local creeks, streams or rivers.

#### H. BORING APPLICATIONS

1. **Steel Encasement: Ductile iron pipe or locking PVC pipe may be used when Steel Encasement is required.**
2. Directional Boring: Locking PVC or ductile iron pipe shall be used. Follow manufacturer's recommendation for installation and maximum deflection.

#### I. CORROSION PROTECTION

1. Polyethylene Encasement Material
  - 1a. The polyethylene encasement material shall be used on all ductile iron pipe, fittings, rods, and appurtenances in accordance with AWWA Standard C-105, ANSI A21.5. The polyethylene encasement shall prevent contact between the pipe and bedding material, but is not intended to be a completely airtight and watertight enclosure.

- 1b. Place the tube of polyethylene material on pipe prior to lowering it into the trench. Pull the tube over the length of pipe. Tape tube to pipe joint. Fold the material around the adjacent spigot end and wrap with tape to hold the plastic tube in place. Overlap first tube with adjacent tube and secure with plastic adhesive tape. The polyethylene tube covering the pipe shall be loose. Excessive material shall be neatly drawn up around the pipe barrel, folded on top of and taped in place. See Polyethylene Wrap Detail Standard Drawing 'A'.
- 1c. Iron-pipe fittings, including valves and hydrants, shall be wrapped with two (2) layers of polyethylene pressure sensitive tape material. The wrapping shall extend at least 1-foot beyond the fitting joints onto the adjoining pipe and fastened to the pipe with plastic tape. The tape shall be used as needed to hold the wrap material in place, close seams and hold overlaps.
- 1d. Damage to the polyethylene encasement material in the trench prior to and during backfill shall be replaced or repaired in a workmanlike manner to the satisfaction of the Water Utility.

#### J. TRACER SYSTEM

1. Tracer Wire: Tracer wire shall be installed with all pipes. Wire shall be laid along the bottom of the pipe, beginning with the first laid section and end at the connection to an existing main. The ends of the wire are to be protected using the material specified in Section II, J.2. Wire shall run continuously along the pipe using 2-inch wide, 10-mil thickness, polyethylene pressure sensitive tape. No below grade splicing of the wire shall be permitted, except as authorized by the Water Utility. See Tracer Wire Detail Standard Drawing 'J'.
2. Tracer Wire Terminals: Tracer wire terminals shall be installed at each public and private hydrant, and at each public and private blow-off.
  - 2a. Hydrants and Permanent Blow-offs: Extend the wire from the pipe connected to the hydrant tee along the hydrant branch and up to the ground surface where it shall be secured to a tracing wire receptacle, see Standard Hydrant Detail with Tracer Wire Drawing 'F' for details.
  - 2b. Temporary Blow-offs: Wrap the tracing wire around the temporary blow-off and secure with tape.
  - 2c. The tracing wire system shall be tested to ensure continuity. The tracing wire test shall be scheduled with the Water Utility.
  - 2d. DryConn Direct Bury Lug shall be used for all connections below ground.
  - 2e. Tracing wire SHALL NOT be brought up at valve boxes.

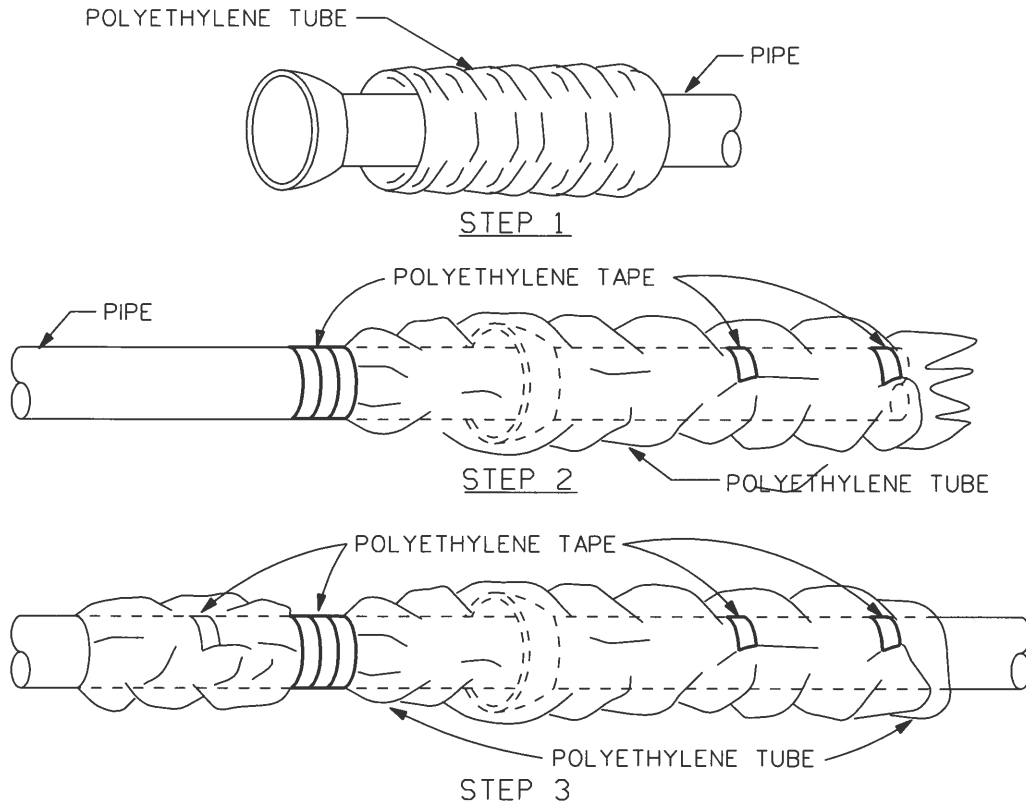
- 2f. Tracing wire is required on all public and private mains.
- 2g. Tracing Wire for Domestic and Fire Service Lines: Tracing wire is required on all private services larger than 2-inches. Tracing wire shall be terminated in the mechanical room and shall be provided with an independent ground.
- 2h. All new and repaired tracer wire shall tie into existing tracing systems. This shall include temporary connections to the distribution system.
- 2i. For all new and replacement mains, where there is no tracing wire **or an existing tracer wire** to connect to, the newly installed tracing wire shall be terminated with an anode ground rod **at both ends**.

URBANDALE WATER UTILITY

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FIELD INSTALLATION - POLYETHYLENE WRAP

Step 1 - Place tube of polyethylene material on pipe prior to lowering it into the trench.

Step 2 - Pull the tube over the length of pipe. Tape tube to pipe at joint. Fold material around the adjacent spigot end and wrap with tape to hold the plastic tube in place.

Step 3 - Overlap first tube with adjacent tube and secure with plastic adhesive tape. The polyethylene tube covering the pipe shall be loose. Excess material shall be neatly drawn up around the pipe barrel, folded on top of and taped in place.

Note: Iron pipe fittings, including valves and hydrants shall be wrapped with two layers of polyethylene material. The wrapping shall extend at least 1' beyond the fitting joints onto the adjoining pipe and shall be fastened to the pipe with plastic tape. Tape shall be used as needed to hold wrap in place. Either polyethylene sheets or slit tubing may be used.

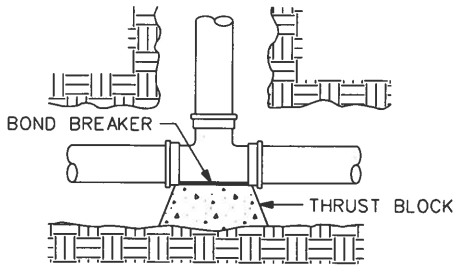
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URBANDALE WATER  
UTILITY

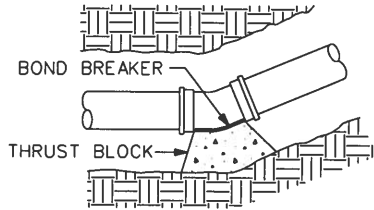
POLYETHYLENE WRAP  
DETAIL

DRAWING 'A'

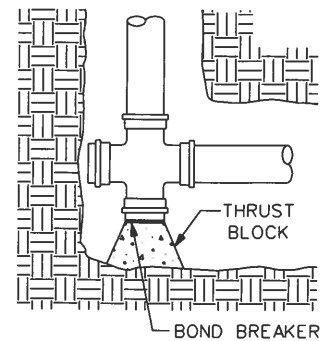
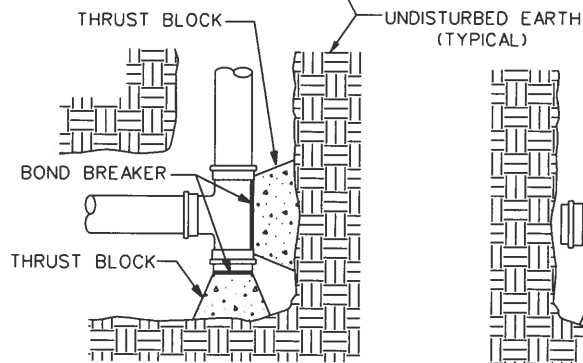
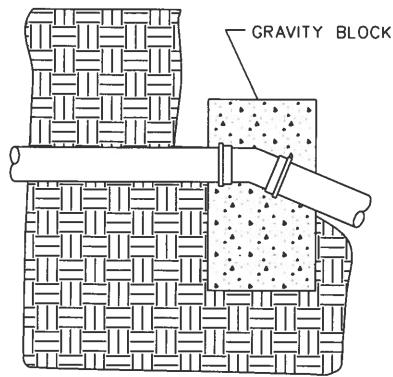
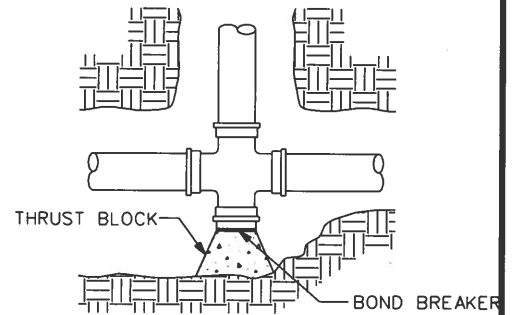
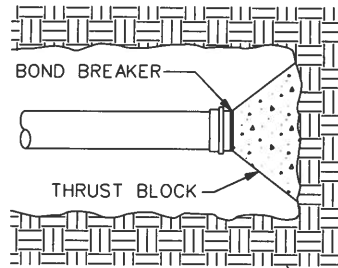
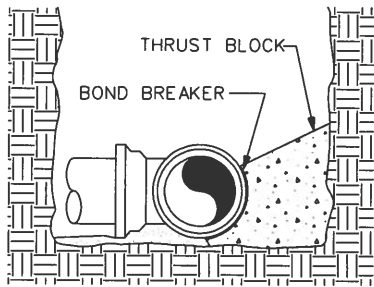
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SIZE OF PIPE	MINIMUM BEARING SURFACE (IN SQ. FT.)				TEE OR DEAD END
	B E N D S				
	11 1/4°	22 1/2°	45°	90°	
6"	1.00	1.25	2.25	4.50	3.00
8"	1.00	2.00	4.00	7.90	5.25
12"	2.00	4.25	8.25	18.00	11.00
16"	8.00	15.25	28.00	48.00	35.00
20"	8.50	16.50	32.00	57.00	40.00
24"	9.00	18.00	35.00	65.00	45.00



Note: Restrained joints may be used in lieu of blocking with prior approval from Urbandale Water Utility.



SCALE: NONE

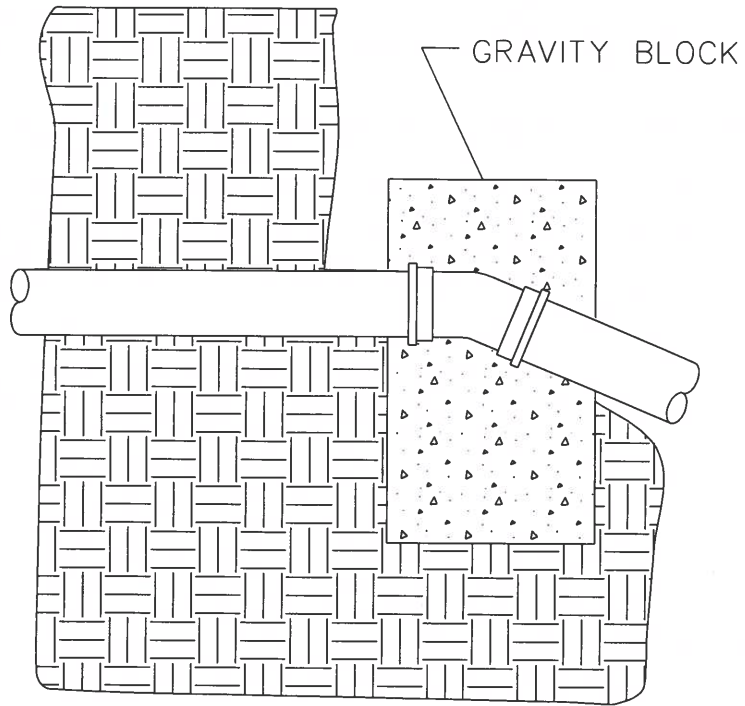
URBANDALE WATER UTILITY

CONCRETE THRUST BLOCK STANDARD

DATE: 08-31-2022

DRAWING 'B'





VOLUME OF GRAVITY BLOCK  
CUBIC METERS (CUBIC YARDS)

PIPE SIZE (INCHES)	ANGLE OF DEFLECTION (DEGREES)			
	11.25	22.5	45	90
4	.16	.43	.910	1.35
6	.16	.43	.90	1.35
8	.30	.76	1.57	2.33
12	.65	1.63	3.33	4.92
16	1.16	2.85	5.80	8.56
20	1.78	4.37	8.91	13.14
24	2.47	6.17	12.63	18.64
30	3.82	9.51	19.43	28.66

**Note:**

Restrained joints may be used in lieu of blocking with prior approval from UWU.

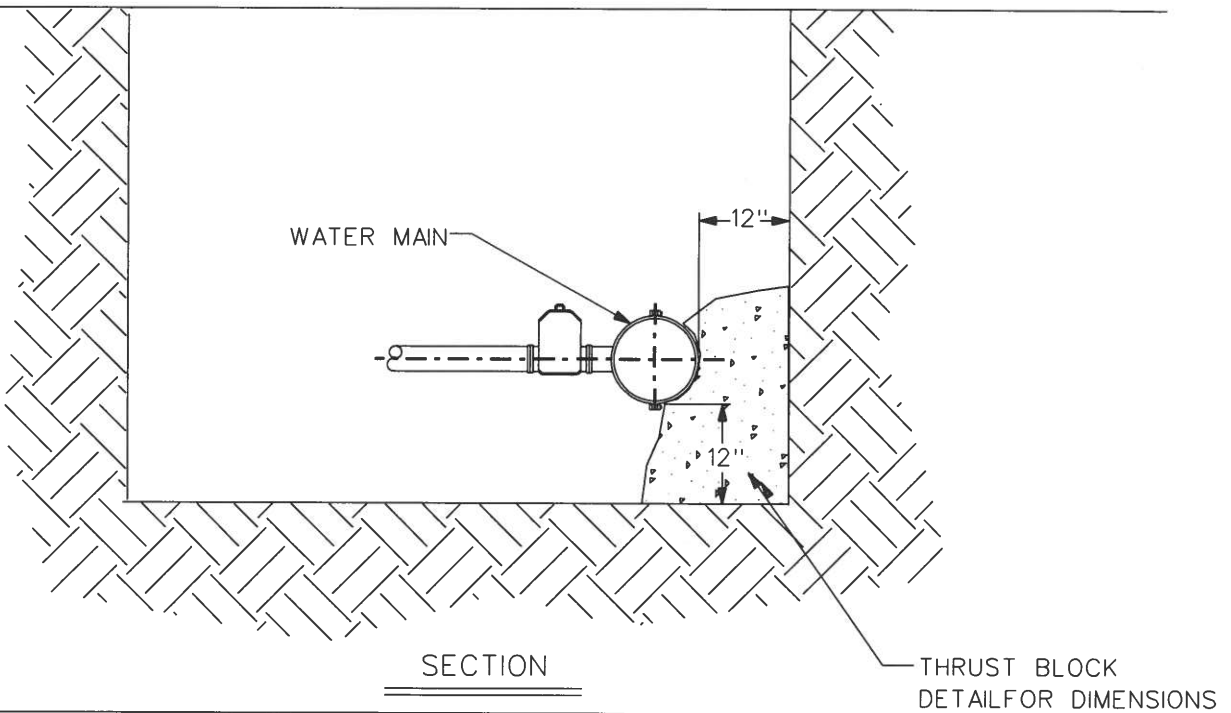
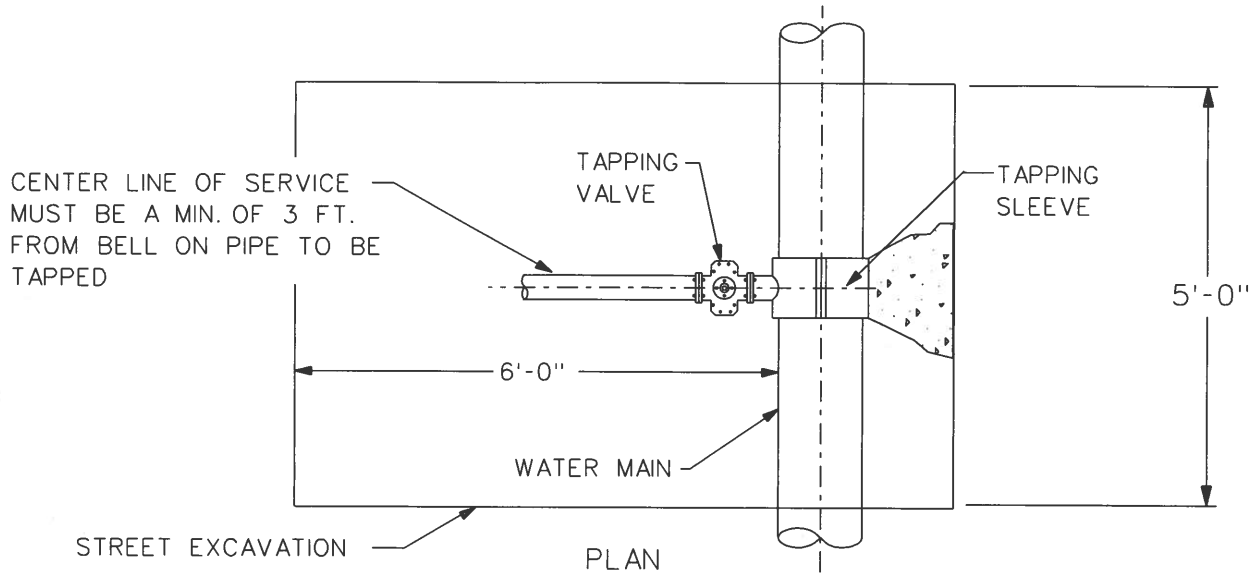
SCALE: NONE

URBANDALE WATER  
UTILITY

CONCRETE GRAVITY  
BLOCK STANDARD

DRAWING 'C'

DATE: 08-31-2022



**NOTES:**

1. IF 2 TAPS ARE TO BE MADE, A MIN. OF 3 FT. BETWEEN SERVICES (C<sub>T</sub> TO C<sub>T</sub>) SHOULD BE MAINTAINED AND THE WIDTH OF THE HOLE INCREASED TO 8 FT, IF BOTH ARE TO BE MADE IN THE SAME HOLE.
2. EXCAVATIONS OVER 4'-11" DEEP MUST BE SHORED BEFORE A TAP WILL BE MADE. EXCAVATION DIMENSIONS ARE FROM INSIDE FACE OF SHORING.
3. TRENCH EXCAVATION/CRIBBING INSTALLATION MUST MEET OSHA STANDARDS.

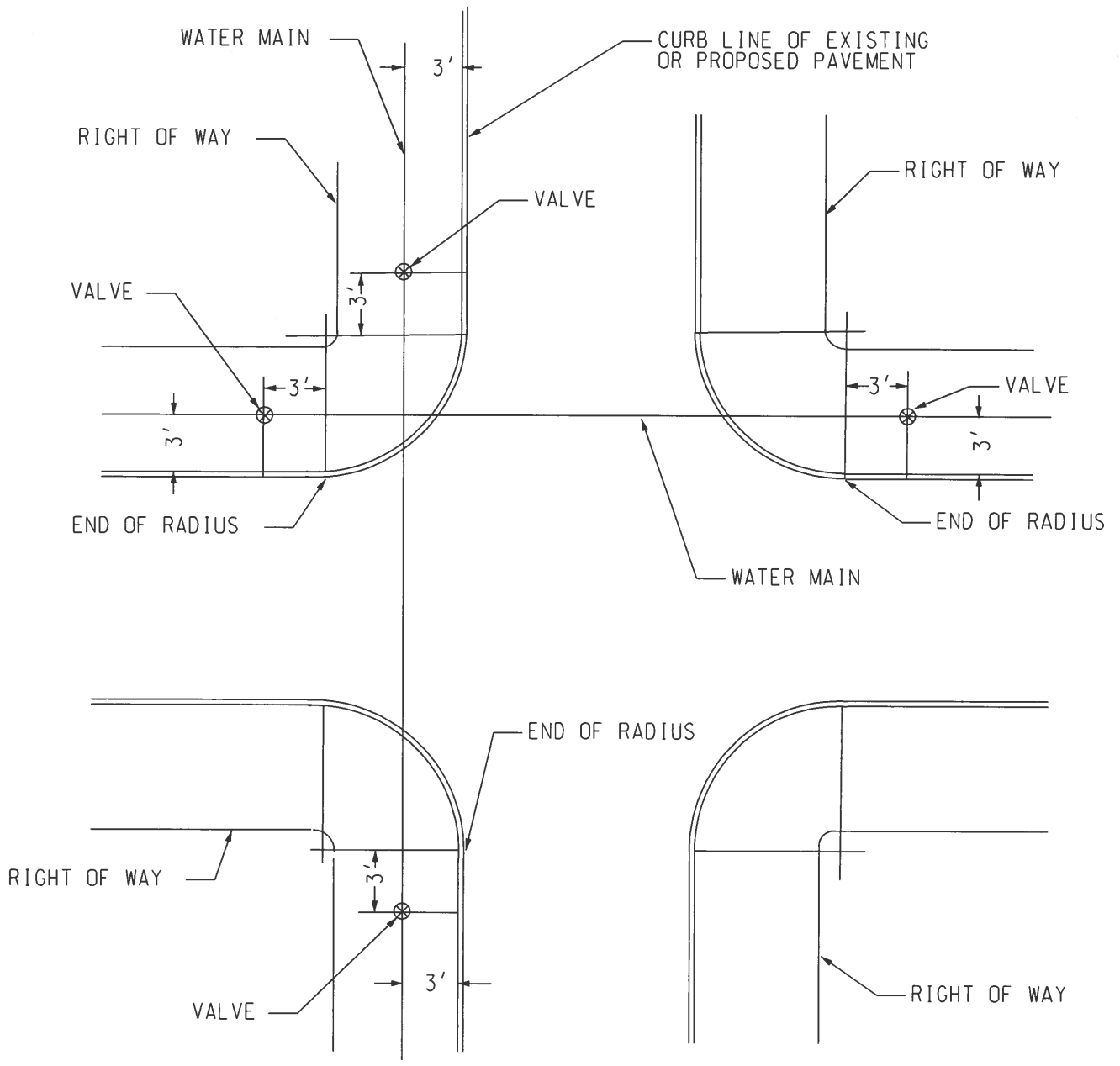
SCALE: NONE

URBANDALE WATER  
UTILITY

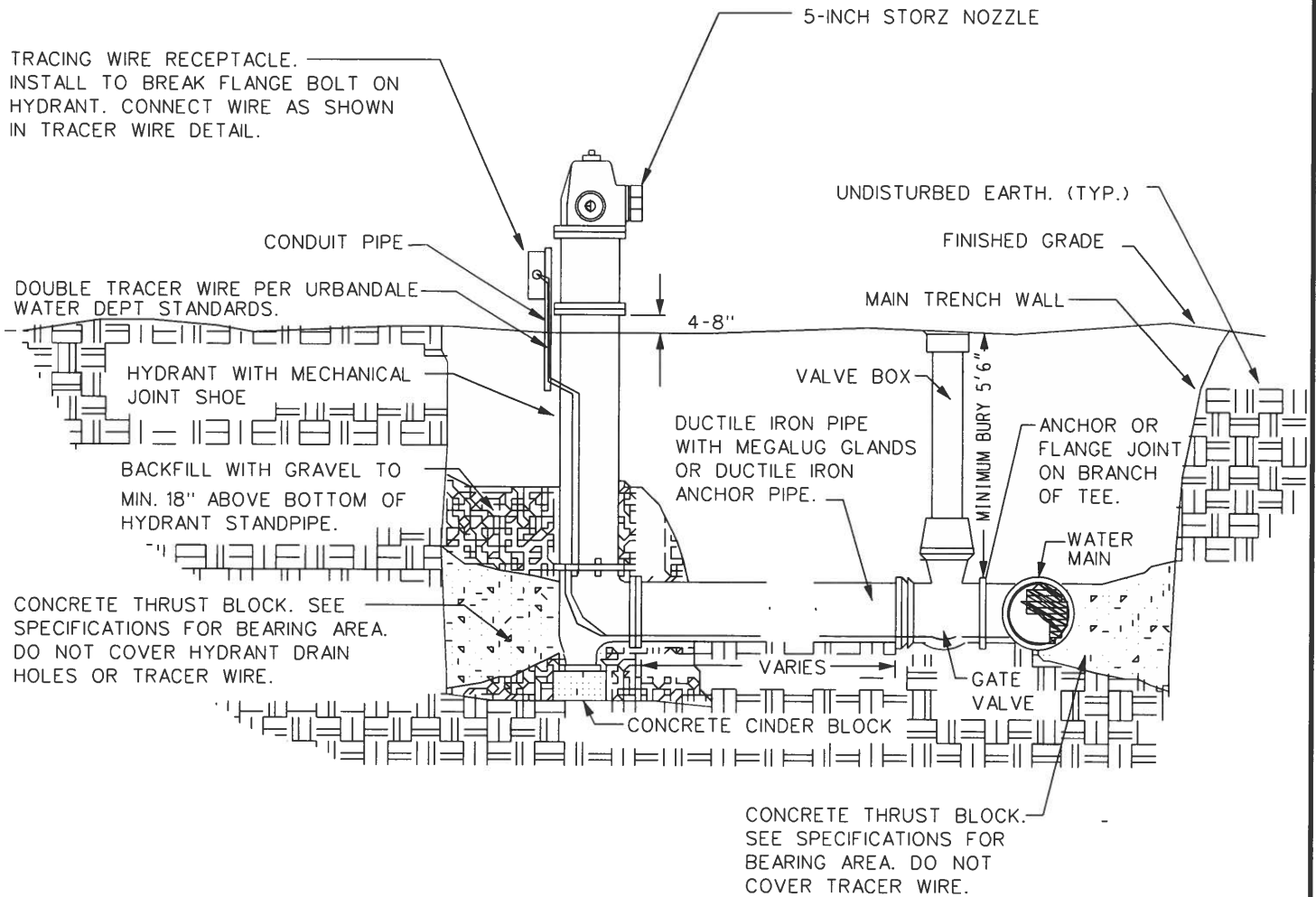
EXCAVATION DETAIL FOR  
TAPPING SLEEVE

DATE: 08-31-2022

DRAWING 'D'



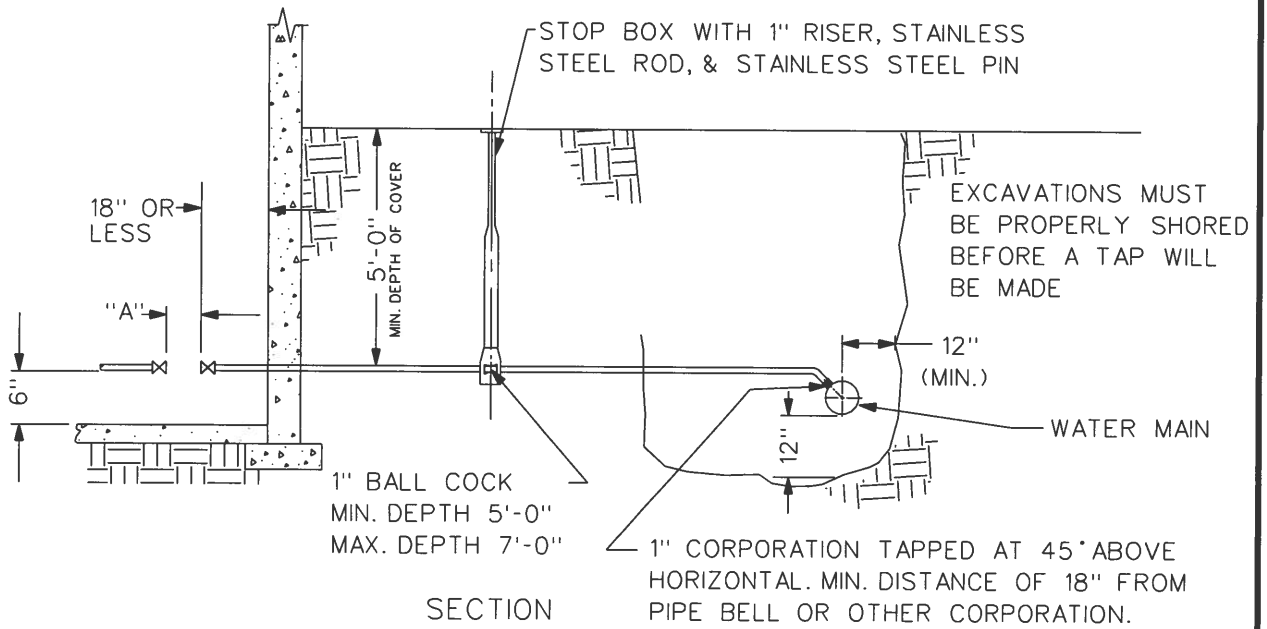
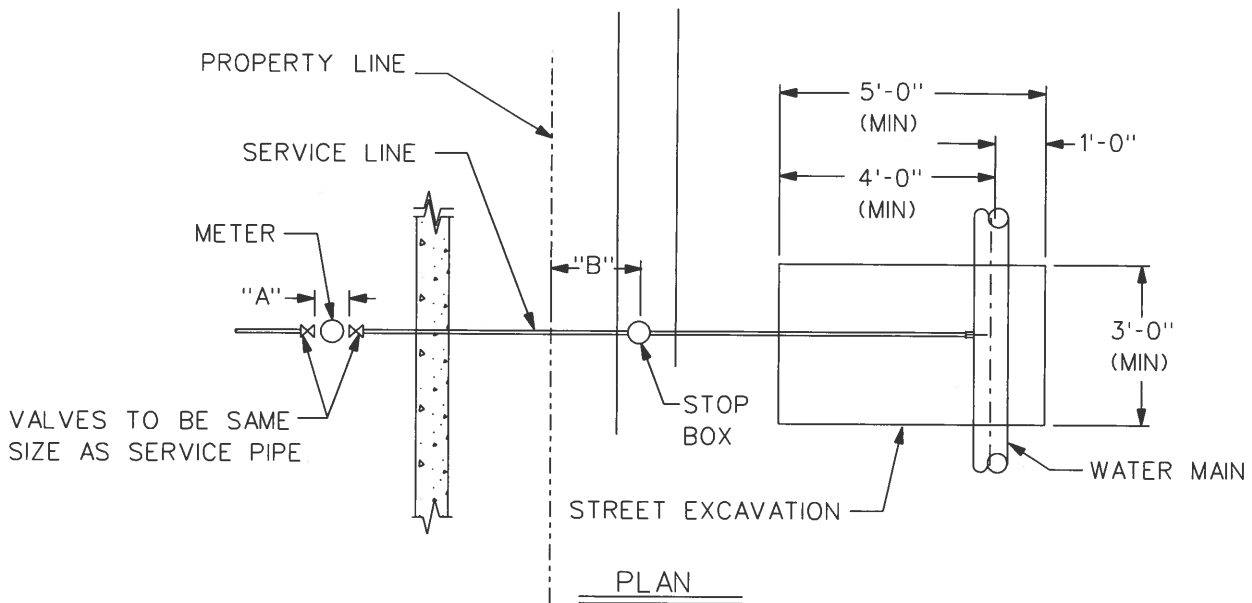
SCALE: NONE	URBANDALE WATER UTILITY	WATER MAIN AND VALVE LOCATION DETAIL
DATE: 08-31-2022		DRAWING 'E'



Note: IRON PIPE, VALVE, FITTINGS AND HYDRANT (BURIED PORTION) TO BE WRAPPED WITH POLYETHYLENE ENCASEMENT MATERIAL PER URBANDALE WATER UTILITY.

SCALE: NONE	URBANDALE WATER UTILITY	STANDARD HYDRANT DETAIL WITH TRACER WIRE
DATE: 08-31-2022		DRAWING 'F'

DISTANCE "B"  
1'-0" TO 6'-0" IN S/W (IF APPLICABLE)



METER SPACING

SIZE OF METER	"A" - FACE TO FACE OF VALVES
5/8"	12"
3/4"	13-1/2"
1"	15"

SCALE: NONE

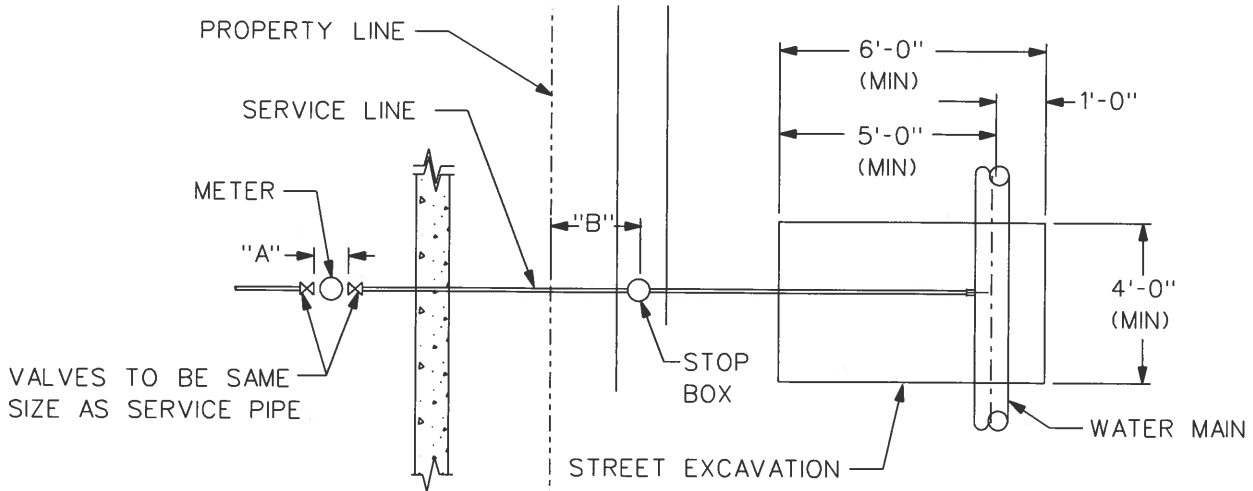
URBANDALE WATER  
UTILITY

DETAIL OF 1" COPPER  
SERVICE INSTALLATION

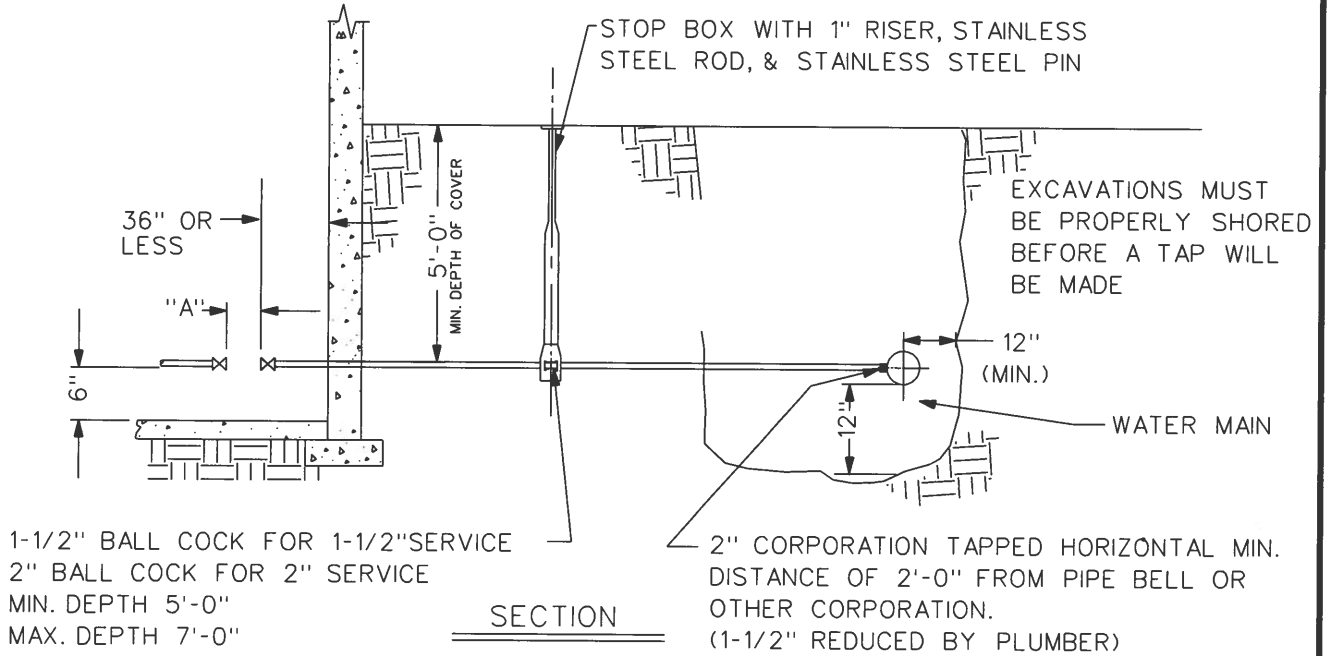
DATE: 08-31-2022

DRAWING 'G'

DISTANCE "B"  
1'-0" TO 6'-0" IN SIDEWALK (IF APPLICABLE)

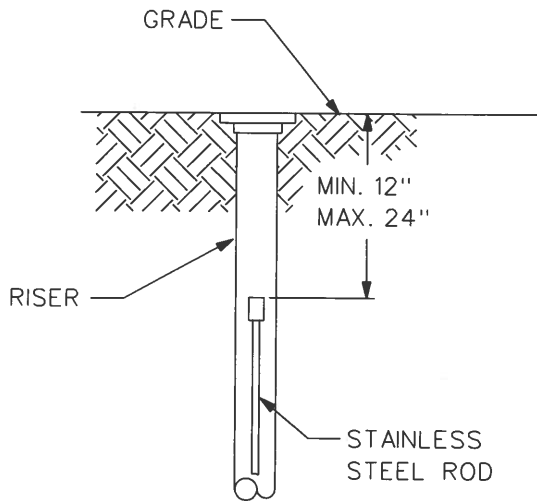


PLAN



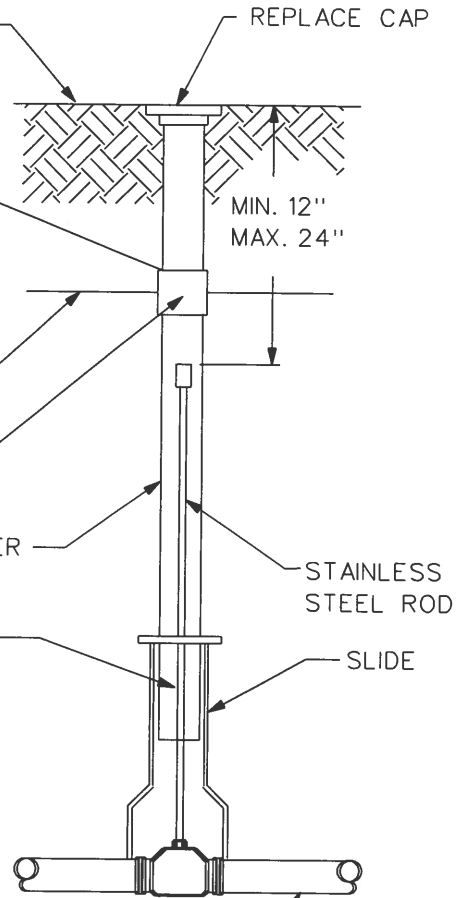
SECTION

	METER SPACING	
<b>SIZE OF METER</b>	<b>"A" - FACE TO FACE OF VALVES</b>	
1-1/2"	13" PLUS FLANGES	
2"	17" PLUS FLANGES	
SCALE: NONE	URBANDALE WATER UTILITY	DETAIL OF 1-1/2" OR 2" SERVICE INSTALLATION
DATE: 08-31-2022		DRAWING 'H'



NORMAL  
INSTALLATION

THREADED PIPE NIPPLE  
SAME DIAMETER AS RISER  
RED LOCKTITE REQUIRED  
OR WELD COUPLING  
TOGETHER



EXISTING SERVICE LINE

STOP BOX RAISED  
TO NEW GRADE

TOP SECTION OF BOX SHALL BE  
EXTENDED NO MORE THAN 1/2  
WAY OUT OF BOTTOM SECTION  
OF BOX

WHEN THE GRADE IS CHANGED IN THE VICINITY OF A STOP BOX, THE STOP BOX MUST BE RAISED OR LOWERED TO THE NEW GRADE. RAISING THE STOP BOX IS ACCOMPLISHED BY REMOVING THE CAP, INSTALLING A PIPE COUPLING AND A THREADED NIPPLE OF THE APPROPRIATE LENGTH AND DIAMETER AND REPLACING THE CAP. THE RISER MUST BE INTEGRAL AND CONTINUOUS. TO LOWER THE STOP BOX. IT WILL BE NECESSARY TO CUT AND RETHREAD THE RISER PIPE AT THE NEW GRADE AND REPLACE THE CAP. ROD MUST BE LOWERED IN PROPER PROPORTION TO RISER PIPE.

ALL STOP BOX EXTENSIONS SHALL BE SECURED IN SUCH A WAY SO THAT IE BECOMES ONE PERMANENT PIPE, SUCH AS WELDING, RED LOCTITE OR SET SCREWS.

URBANDALE WATER  
UTILITY

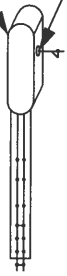
ADJUSTING STOP BOX  
TO NEW GRADE  
(ARCH PATTERN BOX)

DRAWING 'I'

SCALE: NONE

DATE: 08-31-2022

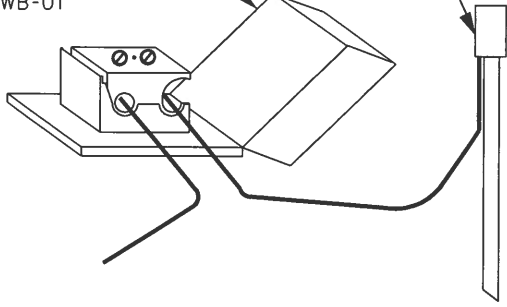
TW18  
RECEPTACLE



TRACER WIRE RECEPTACLE DETAIL  
Not to Scale

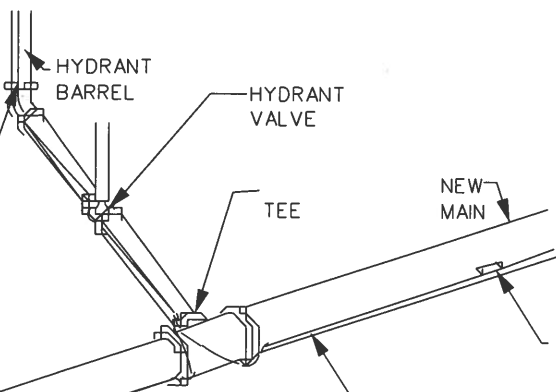
STRIP ENDS OF WIRE  
AND SECURE TO BRASS  
SPLIT BOLT ON INSIDE  
OF BOX.

DRYCONN DIRECT  
BURY LUG PART  
\*3 WB-01



BELOW GROUND  
TRACER WIRE SPLICE DETAIL  
Not to Scale

EXTEND TRACER WIRE UP  
HYDRANT BARREL TO  
RECEPTACLE BOX AND  
BACK DOWN



NOTE: CARE MUST BE EXERCISED -TO  
PRESERVE THE INTEGRITY OF THE  
INSULATION ON THE TRACER WIRE.

\*12 CONTINUOUS SOLID WIRE  
TYPE TW OR THHN. FASTEN  
TO MIDPOINT OF EACH PIPE  
SECTION WITH PLASTIC TAPE

SPLICE AS REQUIRED  
(SEE DETAIL ABOVE)

EXISTING PIPE  
AND FITTING

INSTALL MINIMUM 18.5" LONG, ANODE  
GROUND ROD AT TRACER SYSTEM  
TERMINAL POINTS. USE DRYCONN  
DIRECT BURY LUG, PART \*3  
WB-01

TRACER WIRE DETAIL  
Not to Scale

SCALE: NONE
DATE: 08-31-2022

URBANDALE WATER  
UTILITY

TRACER WIRE  
DETAIL  
  
DRAWING 'J'