

EAST BRUNSWICK TOWNSHIP WATER UTILITY
WATER DISTRIBUTION SYSTEM REGULATIONS

General

Water mains are installed to provide a means for conveying water from the wells or storage tanks to some distant point where it may be used for human consumption, fire protection, watering lawns and gardens. Since this water is used for human consumption, the necessity for safe potable water is easily recognized.

In order to provide a water distribution system of high reliability the construction of same must be inspected to ensure that all rules and regulations are being met and that workmanship in general meets MINIMUM specification requirements. After construction has been completed, all lines must pass a chlorine residual test, a pressure test and a bacteriological test.

It shall be the responsibility of the developer or owner to maintain these lines after preliminary inspection has been completed and the water mains activated. The East Brunswick Water utility, however, reserves the right to direct the responsible party to have the water mains retested when, in the opinion of the East Brunswick Water utility, the water mains or appurtenances have been subject to stress or damage to such a degree that retesting is deemed necessary.

Once all construction has been completed but prior to the East Brunswick Water utility accepting the lines, an inspector from the Utility will perform a final inspection of all water boxes and valves to see that they are physically sound and to proper grade. All hydrants and valves will be inspected and tested to see that they operate properly and that all valves are accessible. Should any problems be encountered during this inspection, it will be the developers or owners responsibility to make the necessary repairs and/or replacements.

Prior to Construction

Prior to starting construction of any water mains within East Brunswick Township, the developer or owner must have in his possession a set of East Brunswick Water utility's approved drawings. In addition, he must have paid all the necessary charges and fees as well as obtaining the necessary bonding. When easements are necessary all paperwork must be in order; and if road opening permits are required, these must also be obtained before work can start.

Property Damage

When private or public property is damaged during construction, it will be the responsibility of the contractor to reestablish same in as good or better condition than it was prior to construction.

Backfill

Select fill will be used for trenches when, in the opinion of the inspector, the soil removed from the trench is not suitable for use as backfill. Fill containing asphalt or rock is unacceptable as backfill.

Trees and Shrubs

The contractor will use the utmost care not to uproot or damage any more trees or shrubs than is absolutely necessary during construction of water mains or associated work.

Methods of Construction

Excavation: Excavation shall not be carried below the required level except where unstable soil is encountered. Whenever excavation has been made below the required level, it shall be replaced with 3/4" crushed stone and shall be thoroughly tamped. The Utility shall determine the depth of removal of unstable soil encountered. Excavation for manholes and other structures shall have a 12" minimum clearance and 24" maximum clearance on all sides. The width of trenches for pipe shall equal pipe outside diameter plus 2' unless otherwise provided by the utility. Rocks and boulders present in excavation shall be removed. Excavations shall be confined within the narrowest possible limit and made as nearly as possible in vertical line, and any sheathing, shoring, bracing and timbering, which is necessary to obtain this result, shall be done as hereinafter specified. Preliminary excavation shall be made only to a depth of 3" above the final depth of any trench or other excavations. The remaining depth shall be carefully excavated, shaped and formed with hand tools immediately preceding laying of the pipe or placing concrete. Trench bottoms shall be accurately formed to receive and support the bottom of the barrel of pipe. Additional excavation shall be made in pipe trenches at the pipe joints and to prevent any possibility of a pipe resting on the bell rather than the barrel. All construction shall conform with AWWA standards, AWWA (C600-82) or latest edition.

Grading: Ground adjacent to the excavation shall be graded to prevent water from running in. The contractor shall remove any water accumulating in excavations by pumping or other suitable means.

Bracing, Shoring, Sheathing: The contractor shall do all bracing, shoring and sheathing necessary to prevent failure of the banks of the excavation and to protect the work, workmen, public, under and above ground utilities and structures, pavement and public and private property. No bracing shoring or sheathing shall be placed below the bottom of the pipe or structure unless approved by the utility. Shoring, sheathing and bracing of any kind shall be withdrawn as the backfilling proceeds, except that the Utility may require such bracing to be left in place if it has been placed below the bottom of any structure or pipe, or if he deems it necessary in order to protect adjacent structures, utilities or property.

Dewatering: The contractor shall provide, install, and operate an adequate well-point system for dewatering when necessary to stabilize trench bottoms and banks or other public, under and above ground utilities and structures, pavement, and public and private property. The well-point system or portions thereof shall be removed by the contractor upon the completion of backfill and the holes remaining from the points shall be backfilled and thoroughly tamped.

Keeping Trench Dry: Any and all ground water which may gather in the trenches from any source whatsoever, must be pumped or bailed to provide a dry trench during the pipe laying functions. No water will be permitted to run through the open pipe joints or through the pipe during the construction period. All water pumped from the trenches shall be disposed of in a manner satisfactory to the owner, developer and/or the utility inspector.

Backfilling: After the structure has been completed, inspected and approved, or, in the case of pipe, after each joint has been made, inspected and approved, backfill shall proceed immediately. When pipe has been laid, this shall be done in 8" layers of loose granular material free from large stones, each layer thoroughly tamped, to a height of 24" above the outside top of pipe. The remainder of the trench and the entire excavation of all structures other than pipe shall be backfilled in 12" layer., loose measure, each layer thoroughly tamped. Dampening of the material to be tamped may be required by the Utility.

Compacting of Soil: Compaction shall conform to section 301 of the New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction.

Pipe Bedding

Care must be taken to bed the pipe properly on a stable bottom. When required, varying amounts of stone must be used to stabilize the area under the pipe. The grading of the trench bottom must be such that the bottom of the pipe, for its entire length, is resting on stable material (stoned bottom or virgin soil) which will result in even loading along the pipe after the trench is backfilled and during the settling process. When this material, in the opinion of the Utility Inspector, is not suitable, the area around the pipe must be filled with stone or select fill up to the springline.

Pipe Laying

Once the trench has been established at the proper depth and grade and in addition to the bottom of the trench satisfactorily stabilized, the pipe and associated items shall be installed. Installation of all lines appurtenances shall be done in the presence of the Utility Inspector. The builder and/or the contractor is responsible for notifying the East Brunswick Water Utility Inspection Department forty-eight (48) hours in advance that inspection will be required at a specific time and place. Should the contractor neglect to notify the East Brunswick Water Utility that inspection is required, and proceed without inspection, all work performed without inspection will be considered unacceptable .

Water mains shall be laid in straight lines except when otherwise specifically approved by drawings or directed by the Utility Inspector. When deviation from a straight line is permitted, the deflection of each joint shall not exceed the manufacturer's recommended maximum for the type of joint and size of pipe being installed. Pipe shall be laid with at least four feet (4') of cover over the pipe to proposed finished grade or to the future finished grade when such is lower. Along extensions of roads which are unimproved, the pipe shall be laid with at least five feet (5') of cover over the top of the pipe to the existing grade. The depth of pipe may be increased locally to pass obstructions. Grade changes shall be accomplished by fittings and/or dividing the necessary deflection among several joints as approved by the inspector.

Special care shall be exercised to remove all dirt, stones and other materials from each pipe as it is laid, and to prevent any such materials from entering the pipe line. The contractor shall see that the entire line is maintained absolutely clean on the inside and that all valves and hydrants are clean and in good working order when installed. Open ends shall be adequately protected at all times and shall be securely sealed with approved plugs whenever work is stopped for any reason whatsoever. After removing a plug, the interior of the pipe line shall be inspected and cleaned before resuming pipe laying operations.

Before placing each length of pipe, the contractor shall carefully examine it for breaks, cracks or other defects and shall discard any section which appear in anyway to be defective. All pipe and fittings shall be handled and installed with care to avoid damage. Ringing of cast iron with a small hammer is recommended to detect cracks in the pipe that may not be readily visible to the naked eye.

Each section of pipe shall be solidly bedded in the trench bottom and shall be supported for its full length.

Before making a connection, the ends of the pipes and all joint members shall be thoroughly cleaned. All mating shall be done in strict accordance with the manufacturer's recommendations and the requirements of the Utility's inspector.

The contractor shall do all necessary pipe cutting and shall locate valves, fittings and fire hydrants in the exact positions indicated only approved drawings. Contractor shall provide and use cutting tools of an approved type and in good order, so as to ensure clean, square cuts to exact measurements.

All fittings and valves shall be set accurately true to and square with pipe lines. Valve stems shall be accurately plumb. Fittings and valves shall be supported by approved blocking so as to ensure their remaining accurately in position during jointing and in such a manner that their weight will not place undue strain on connection pipe or joints. Valve boxes shall be set plumb, accurately centered with respect and with their tops flush with the finished grade of the roadway or surface to the ground where set.

Materials

Ductile Iron Pipe: All ductile iron pipe shall be Class 52 and conform to the requirements of ANSI A21.50 1981 (AWWA C150-81) or latest edition and shall be manufactured in 18 or 20 root nominal lengths.

The joints shall be of the Tyton Joint Type (Push-on-joint) using a single elongated gasket to effect the joint seal, unless mechanical joints are noted on the joint seal, unless mechanical joints are noted on the drawings. All mechanical joints and push-on-joints shall conform to the requirements of ANSI A21,11-1980 (AWWA C111-80) or latest edition.

All manufacturers will validate other than by certification, the ductility of each length of pipe by an Underwriters Laboratory approved method. All ductile iron pipe is to have Underwriters Laboratory approval.

All fittings, elbows, valves, and hydrants must be connected with mechanical retaining glands.

Cement Lining: All ductile iron pipe shall be cement lined in accordance with ANSI Specifications A21.4 - 1980 seal coated inside (BCL & SC), 4" - 12" pipe MIN. 1/8", 18" pipe MIN. 3/16, (AWWA C151 1982 latest edition) with a minimum pressure rating of 250 psi.

Polyvinyl Chloride (PVC) Water Distribution Pipe: All polyvinyl chloride distribution pipe shall have integral bell and spigot joints and shall meet the requirements of AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings (DR14 or DR18), 4-Inch through 12-Inch, for Water Distribution. Pipe compound shall meet cell class 12454 per ASTM D1784 Standard Specification for Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds. Standard Laying Lengths: Standard laying lengths shall be 20 ft. (± 1 ") for all sizes. Other Requirements: Provisions must be made for expansion and contraction at each joint with an elastomeric seal. The bell shall consist of an integral thickened wall section with an elastomeric seal. The wall thickness in the bell section shall conform to the requirements of Section 6.2 of ASTM D3139, A Standard Specification for Joint for Plastic Pressure Pipes Using Flexible Elastomeric Seals. Pipe shall meet the requirements of ANSI/NSF 61 Drinking Water System Components C Health Effects. The pipe shall be manufactured to cast iron outside diameters (CIOD) in accordance with AWWA C900-07. The seal shall meet the requirement of ASTM F477. Standard for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

Mechanical Joint Restraint for PVC Pipe: Mechanical joint restraint shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10. and shall be Series 2000PV produced by EBAA Iron Inc. or approved equal.

Locator Wire: Locator wire shall be minimum #9 AWG suitable for direct burial rated at 600 VAC. Locator wire shall be placed on the top side of the PVC pipe. Wire shall be attached to the pipe using nylon cable ties spaced at ten-foot (10') intervals. Locator wire shall be continuous along entire length of pipe. Heat shrink splice kits shall be used where wire sections need to be spliced. Locator wire ends shall be terminated at the valve box and curb stop pit using a copper set screw lug attached to the valve box and the curb stop.

Valves and Valve Boxes: Valves shall be resilient wedge gate valves (Muellar A2360 or approved equal) in accordance with the latest standard specifications for gate valves, of the AWWA. To be iron body, bronze mounted double disc with parallel rising stem type; mechanical joint ends. All valves shall be opened by turning counterclockwise.

Fire Hydrant

Mueller Hydrant A-423 (or Approved Equal)

- a. Size of hydrant - 5" minimum.
- b. Direction to open - counter-clockwise.
- c. Size and shape of operating nut -
1 1/2" from point to flat-pentagon.
- d. Size of hose nozzle - 2 - 2 1/2 I.D.
National Standard. Thread - 7 1/2
threads per inch. 1 steamer nozzle
O.D. 5.750 - I.D. 4 1/2" 4 threads per inch.
- e. Internal valve opening - 5 1/4".
- f. Color:

Barrel - red.
Top and nozzle caps - fluorescent white.
- g. Depth of bury - 4'6".
- h. Size and type of connection to main -
6" - MJ.

Hydrants will be located in accordance with drawing approved by the utility. The steamer connection will be turned to face the road or street to provide easy access.

The elevation of the hydrant will be such that the center of the steamer connection will be not less than eighteen inches (18") from the finished grade or top of the curb.

A stone sump two feet (2') in length, width and depth will be installed under each fire hydrant to permit the hydrant to drain after it has been turned off. (Use 3/4" stone.)

The hydrant shall be rodded (see hydrant sketch). All hydrant installations shall conform to AWSI/AWWA C600-82 Sec. 3.7 or latest edition.

Tie-Rods

When tie-rodding is used, the following, as a minimum, shall be required:

NUMBER OF 3/4 RODS REQUIRED

<u>Pipe Size (Inches)</u>	<u>No. of Rods</u>
12" and less	2
14" and 16"	4
18" and 20"	6
24"	8

Thrust Blocks

Thrust blocks will be installed or lines rodded at all bends and at all tees, plugs, valves, blow-offs, reducers and fire hydrants. This is to prevent movement of the lines or appurtenances under pressure. The contractor will use rods instead of thrust blocks or the reverse when directed by the Utility inspector.

The following is a list of requirements governing the construction of thrust blocks:

1. All thrust blocks will be constructed of poured concrete with a minimum twenty-eight (28) day compression strength of 3500 psi. Dry laid concrete block or any other type of construction is not acceptable for thrust blocks unless prior approval has been obtained in writing from the East Brunswick Water Utility.
2. The bearing area of the thrust blocks will be poured against undisturbed soil and the bearing area shall be sufficient to prevent any movement when lines are tested and again when they are put into operation. The thrust block size will vary with the size of the line and soil bearing properties of the exposed earth. In making this calculation, always use 150 psi as the internal line pressure.

Water Meter Pits

When and if required and/or necessary, all meter pits shall be approved by the Authority.

Water Line and Sewer Line Separation

Water and sewer mains normally will be separated, a distance of at least ten feet (10') horizontally. If such lateral separation is not possible, the pipes shall be in separate trenches with the sewer at least eighteen inches (18") below the bottom of the water main; or such other separation as approved by the East Brunswick Water Utility shall be made. In general, the vertical separation at a crossing of water and sewer line shall be at least eighteen inches (18"). Where this is not possible, the sewer shall be constructed of cast iron pipe using mechanical or slip-on joints, or hot poured lead joints for a distance of at least ten feet (10') on either side of the crossing or other suitable protection shall be provided, such as concrete encasement of the sanitary sewer for ten feet (10') either side of the water pipe. This encasement is to be six inches (6") thick.

Tapping of Mains for Water Services

Tapping of the main shall not be permitted until the following conditions are met.

1. Connection fees paid.
2. Road opening fees paid, (local, county, and state).
3. Water main tapping fee paid.
4. 48 hour notice for request for tap.

All excavation is the responsibility of the customer. (See trenching sketch).

**TESTING PROCEDURES
FOR THE
EAST BRUNSWICK WATER UTILITY
WATER SYSTEMS**

Purpose

The purpose of this procedure is to establish a uniform method and practice in testing public water supply systems for exfiltration, chlorine residual, disinfection, and bacteria. All procedures shall conform with AWWA standards.

Pressure Test Procedure

The tests shall be performed in the presence of the East Brunswick Water Utility inspector, and shall conform to AWSI/AWWA C600-82 Sec. 4 or latest edition.

1. After the pipe has been laid or installed, it shall be subjected to a pressure and leakage test. For pressure piping trench, this shall be conducted prior to the complete backfilling of the trench, unless otherwise permitted by the Utility and for pressure piping in structures, this shall be conducted prior to the completion of any construction which would make it impossible or difficult to gain access to the pipe if found defective. The contractor shall test sections of the pipes between valves, where practicable or where ordered by the Utility.
2. The contractor shall make the necessary arrangements with the Utility for the procurement of water for the pressure and leakage tests, and for subsequent sterilization, and shall furnish the necessary labor, pumps, valves, pressure gauges, water meters and all other equipment required for this purpose. Each section of pipe shall be slowly filled with water and the pipe shall be subject to a hydrostatic pressure 150 psi and maintained for a period of two (2) hour. Before applying the specified test pressure, all air shall be expelled from the pipe, through hydrants, blow-offs, or any taps that may be necessary for the release of air from the highest points. Taps required for the release of air and blow-offs required for filling the line shall be furnished and installed by the contractor.

Disinfection: All disinfection shall conform to ANSI/AWWA C601-81 or latest edition.

Sterilization

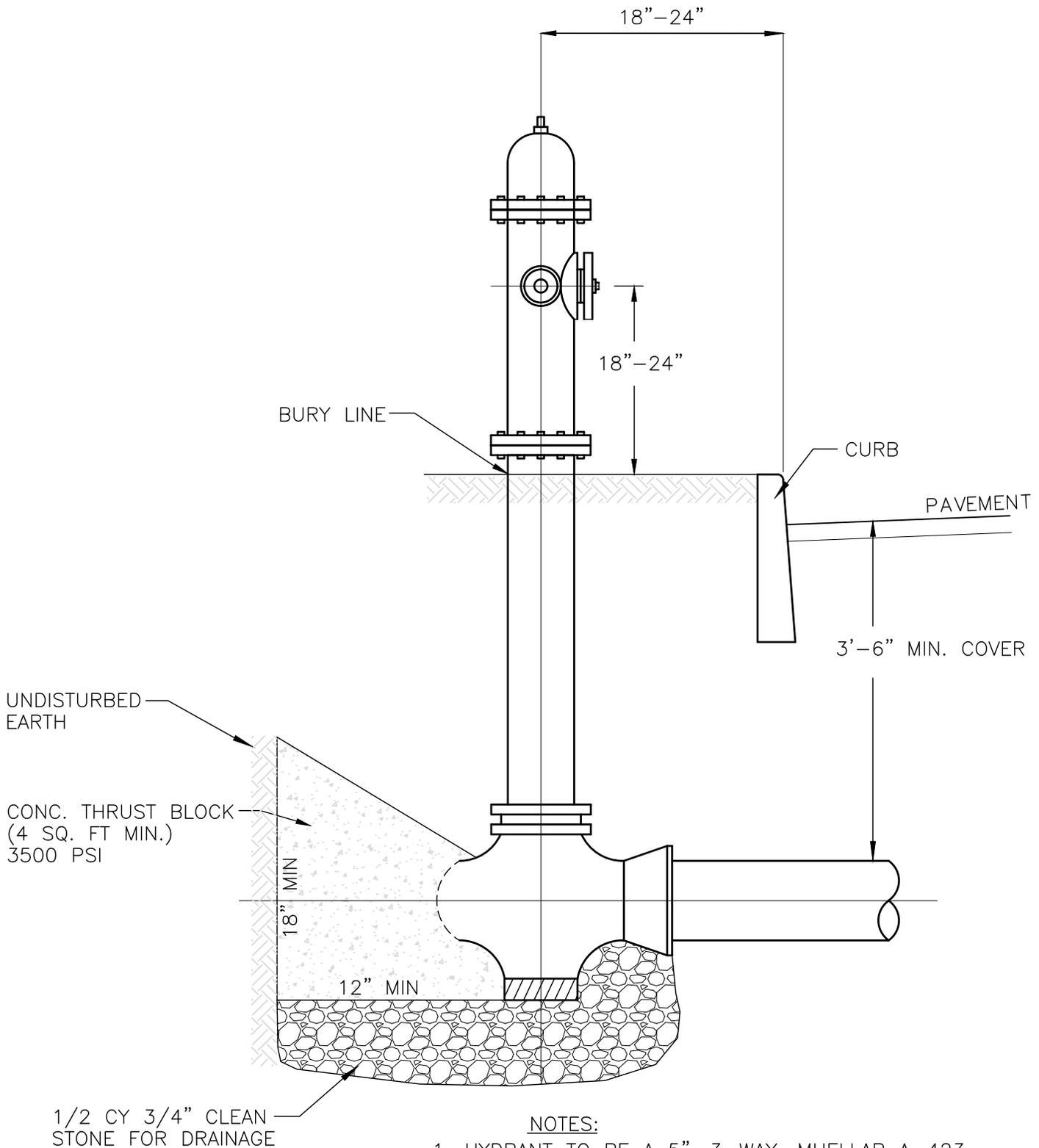
The amount of chlorine applied shall be such as to provide a dosage of at least 50 ppm. The contact period shall be at least 24 hours, at the end of which time the chlorine residual shall be at least 10 ppm. The line should then be flushed with clean water until the chlorine residual is not greater than 0.2 ppm.

1. Each completed unit of the water main and distribution system shall be thoroughly sterilized with chlorine before it is placed in operation.
2. The chlorine required may be in the form of liquid, powder or high test calcium hypochlorite (HTH) in tablet form.
3. Other methods of sterilization may be used however, prior approval of the Water production Superintendent in writing must be obtained prior to the test being performed.

Bacteria Test

1. After flushing has been completed and the chlorine residual is not greater than 0.2 ppm, a bacteriological sample shall be taken in accordance with the New Jersey Department of Environmental Protection Agency, Safe Drinking Water Act M.J.A.C. 7:10-1 July 1979.
2. The mouth of the valve, hydrant, blowoff, etc. shall be sterilized using a propane torch or equivalent and then allowed to flow for a period of not less than 5 minutes.
3. The standard sample shall be collected in sterile bottles, by the representative of the certified laboratory, care being taken not to contaminate the neck of the bottle or stopper during collection.
4. This sample will then be delivered to a certified laboratory by the individual collecting the sample.
5. Copies of the analysis shall be sent to the East Brunswick Water Utility inspector directly from the laboratories.
6. In the event that the laboratory analysis shows bacteria present, the line shall be re-chlorinated, sterilized, flushed, and a new sample taken until such time that the line met the Safe Drinking Water Act Standards.
7. Samples must be taken in the presence of an East Brunswick Water Utility inspector.

Prior to any public water supply system being accepted by the East Brunswick Utility, all of the requirements contained herein shall have been satisfied.

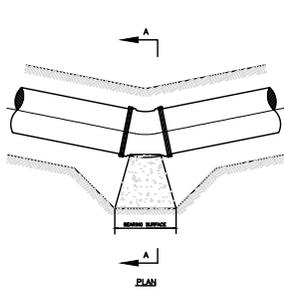


NOTES:

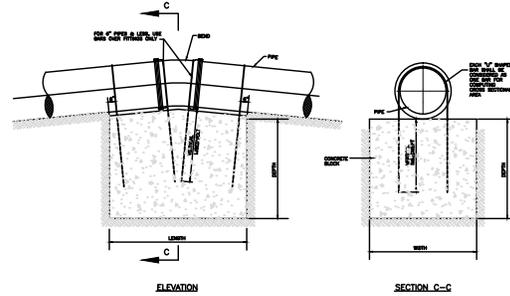
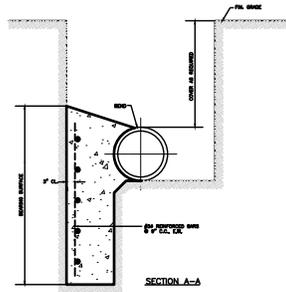
1. HYDRANT TO BE A 5", 3-WAY, MUELLAR A-423, OR CLOW MEDALLION.
2. HYDRANT CAN ALSO BE MECHANICALLY RESTRAINED WITH 3/4" STAINLESS STEEL THREADED ROD (MIN. 2 RODS).

HYDRANT DETAIL

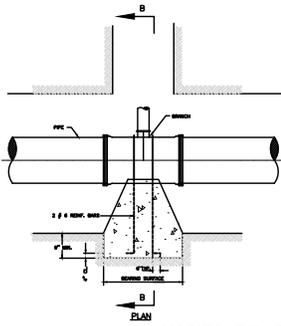
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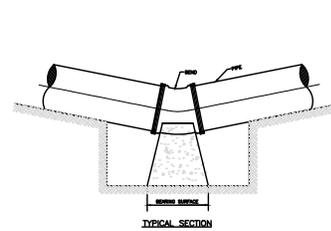
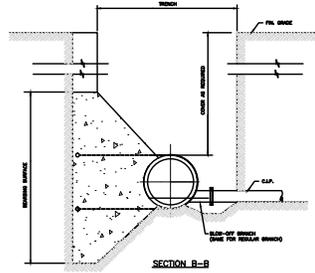
HORIZONTAL BENDS



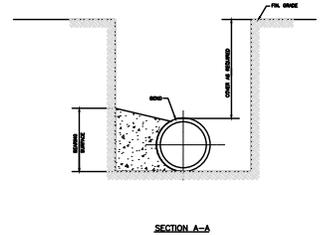
VERTICAL BENDS WITH UPWARD THRUST



HORIZONTAL TEES AND BLOWOFFS



VERTICAL BEND WITH DOWNWARD THRUST



PIPE SIZES	6" AND 8"				10" AND 12"				20" AND 24"				36"			
	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
TYPE OF BEARING MATERIAL & ALLOWABLE LOADS	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'
SAND 1 TON/SQ. FT. SOFT CLAY 1 TON/SQ. FT.	1.50	3.00	6.00	12.00	5.50	11.00	21.50	43.00	13.6	27	52	97	30.6	59.6	117	220
SAND & GRAVEL 2 TON/SQ. FT.	1.00	1.50	3.00	6.00	2.5	5.50	11.00	21.50	6.8	13.5	26	48.5	15.3	29.8	58.5	110.0
CLAY 3 TON/SQ. FT.	1.00	1.00	2.00	4.00	2.00	3.50	7.00	14.00	4.5	9	17.3	32.3	10.2	19.9	39	73.3
SOFT ROCK 5 TON/SQ. FT.	1.00	1.00	1.00	2.50	1.00	2.00	4.50	8.50	2.7	5.4	10.4	19.4	6.1	11.9	23.4	44
ROCK 20 TON/SQ. FT.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.0	1.3	2.6	4.8	1.5	2.9	5.8	11

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2500 p.s.i. AT THE END OF 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE DEFORMED BARS.
3. NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
4. PAINT ALL EXPOSED STEEL WITH 2 COATS OF BITUMASTIC AFTER INSTALLATION.

MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUST DOWNWARD (150 p.s.i. WORKING PRESSURE)

THRUST BLOCKING FOR VERTICAL BENDS WITH DOWNWARD THRUST AND HORIZONTAL BENDS

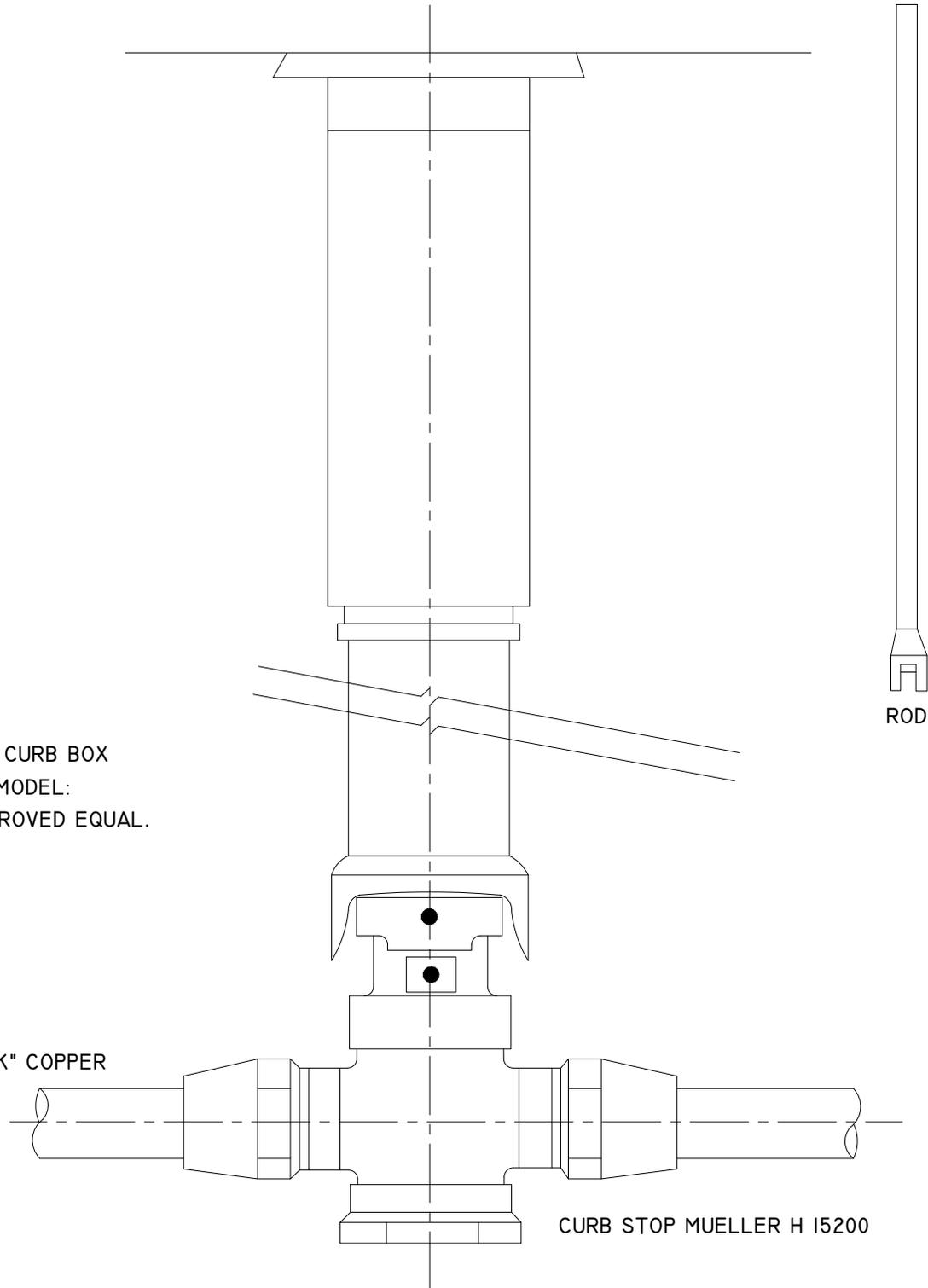
PIPE SIZE	6" AND 8"			10" AND 12"			20" AND 24"			36"		
DEGREE BEND OR DEFLECTION	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'
LENGTH	3'	4'	6'	6'	8'	11'	7'	10'	14'	9'	12'	17.5'
WIDTH	3'	3'	3'	3.5'	3.5'	5'	5'	6'	7'	7'	8.5'	10'
DEPTH	2'	3'	4'	3.5'	5'	5'	5'	6'	7'	6.5'	8'	9'
SQ. IN. REBAR	0.15	0.28	0.57	0.60	1.18	2.31	1.36	2.7	5.2	3.06	5.96	11.7
MASS CONCRETE CU. YD.	0.66	1.33	2.66	2.7	5.2	10.2	6.7	13.3	25.7	15.1	29.4	57.8

DIMENSIONS OF CONCRETE BLOCKING FOR VERTICAL BENDS WITH AN UPWARD THRUST (150 p.s.i. WORKING PRESSURE)

THRUST BLOCKING FOR VERTICAL BENDS WITH UPWARD THRUST

NOTE:
USE BUFFALO STYLE CURB BOX
BINGHAM & TAYLOR MODEL:
FIGURE 4930 OR APPROVED EQUAL.

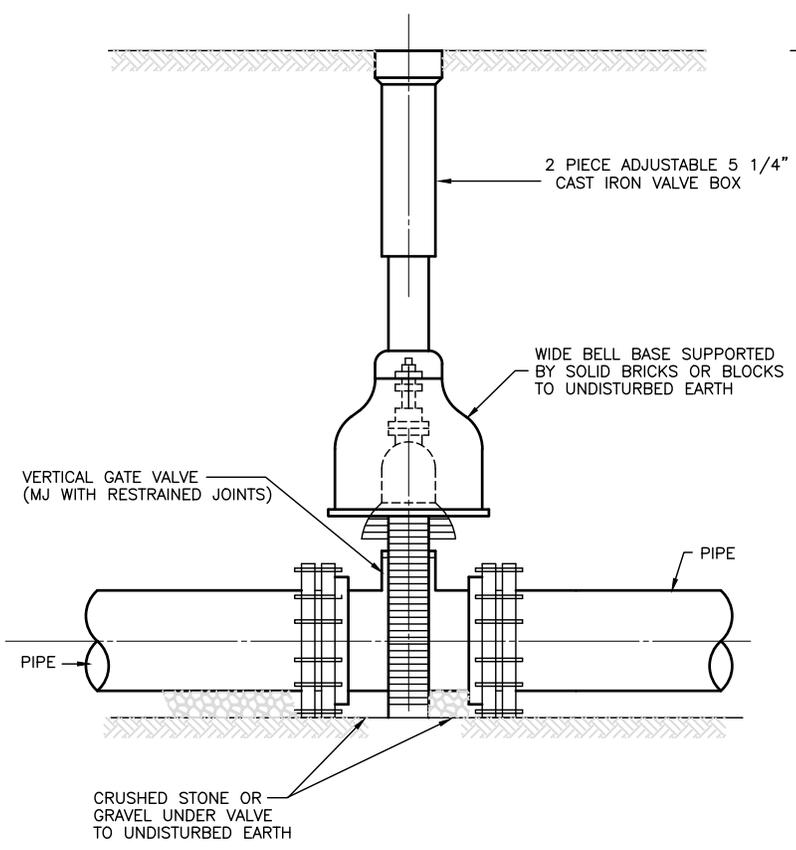
1" MIN. TYPE "K" COPPER



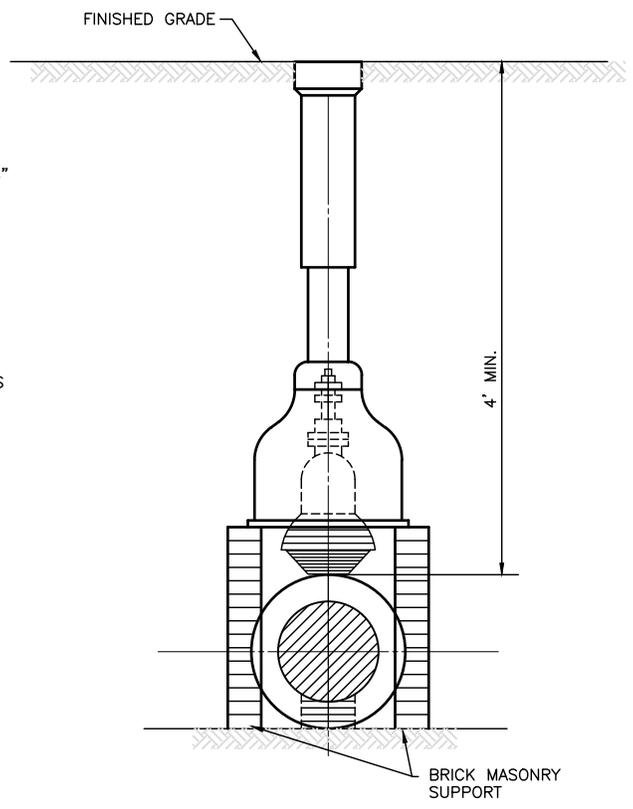
CURB STOP MUELLER H 15200

CURB BOX DETAIL

N.T.S.



ELEVATION - SIDE VIEW

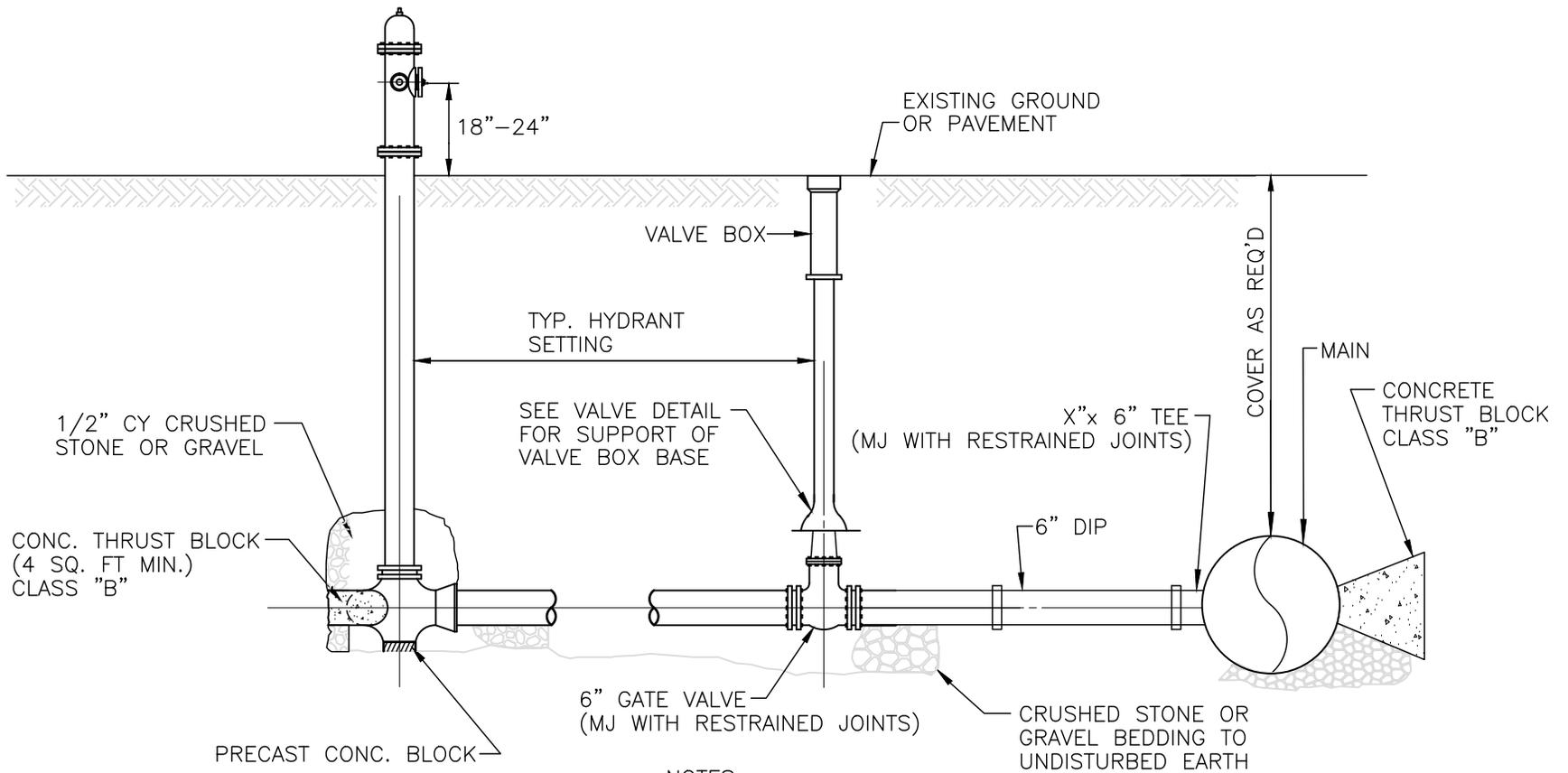


ELEVATION - IN LINE VIEW

- NOTES:
1. NO PART OF VALVE BOX OR BASE TO TOUCH VALVE
 2. PAINT NUTS AND BOLTS ON JOINTS WITH 2 COATS BITUMASTIC AFTER INSTALLATION.

TYPICAL GATE VALVE INSTALLATION

N.T.S.



NOTES:

1. PAINT NUTS AND STUDS ON FLANGE JOINTS WITH 2 COATS OF BITUMASTIC AFTER INSTALLATION
2. PIPE - 6" DUCTILE IRON (RESTRAINED)

HYDRANT CONNECTION DETAIL

N.T.S.

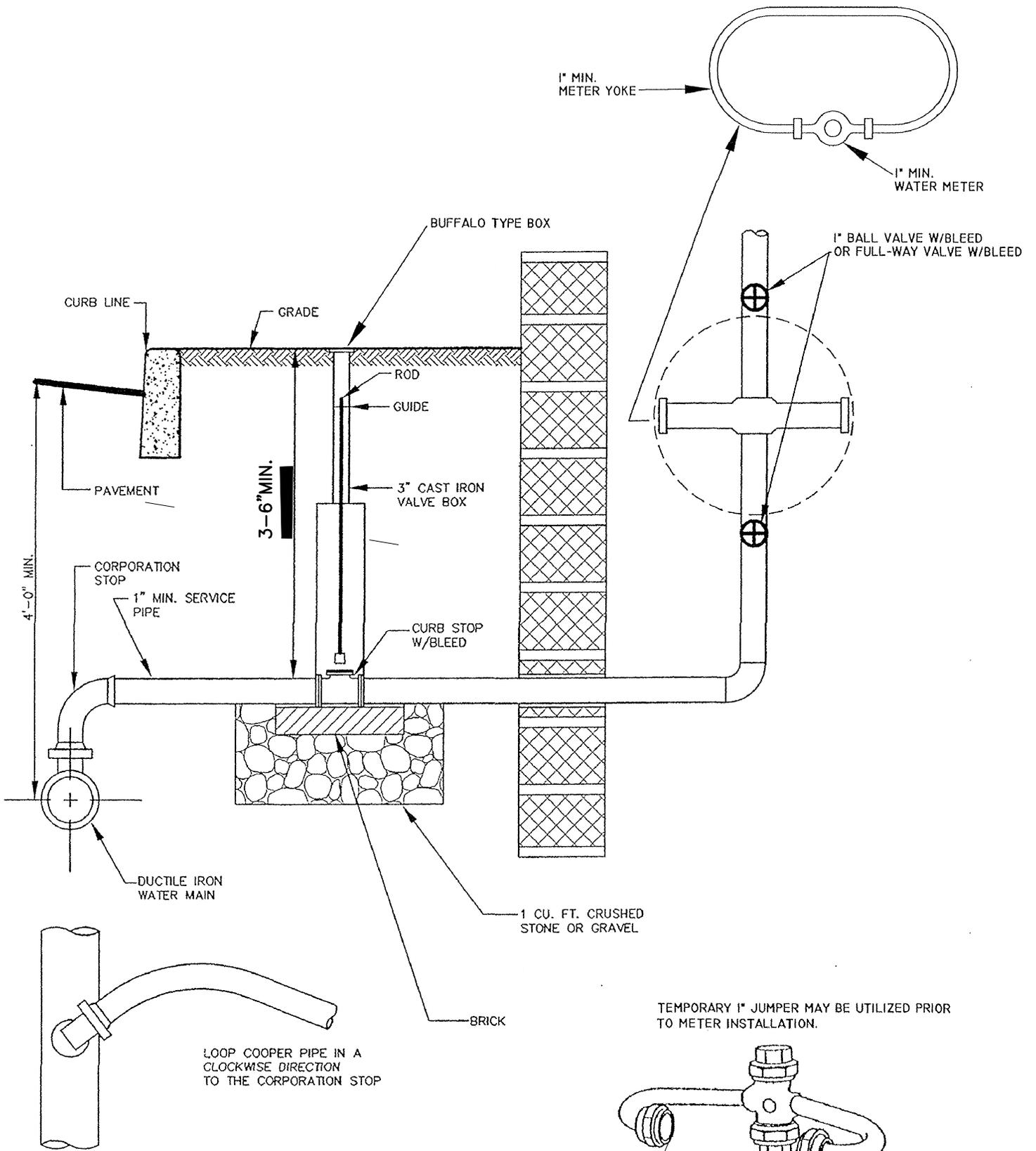
METER INSTALLATION REQUIREMENTS
TYPICAL 1" HOUSE SERVICE & METER INSTALLATION

(SEE DIAGRAM)

1. All fees to be paid prior to permits being issued, meter installed and account activation.
2. Meters are to be installed in heated, lighted and ventilated area with adequate access for the installer.
3. All new construction, minimum 1" service, meter and valves.
4. Meter to be located as close to entry wall as possible.
5. All service lines must be sleeved and sealed through wall with PVC pipe.
6. Ball valve required before and after meter.
7. All meters to be installed horizontally only.
8. Minimum 2' height from floor, maximum 4' height from floor for the meter.
9. All piping to be secured to wall within 18" both sides of meter horn.
10. No electrical outlets with 3' radius of meter.
11. Outside Remote: .16 gauge, 3 conductor wire to be installed by the contractor to outside remote location. Meter installer to connect at time of meter installation.
12. Meters supplied by East Brunswick Water.
13. Tapping Procedures:
 - after fees paid call (732) 257-8314 to schedule tapping
 - call732-390-6870 to schedule road opening
 - contractor excavates
 - traffic control, if needed, call 732-390-6919
 - Water Utility supplies and installs tap

- contractor installs minimum 1" "K" style copper from tap to curb box
 - call Engineering Inspection (732-390-6870) for inspection of tap and service to and including curb box. 24 hour advance notice required.
14. Contractor to install "K" copper or E.B. Water Utility approved poly pipe.
 - Poly Pipe Requirements: Stamped 200 PSI rated, AWWA approved, coil rolls only, no connections between curb box and meter
 - if poly used, .16 gauge tracer wire must be fastened to curb stop and meter and duct taped to poly pipe every 18 inches
 15. Call Plumbing Inspector for inspections from curb box to meter and entire unit at 732-390-6875.
 16. After inspection and approvals, call Meter Division at 732-390-6824 for installation and account activation.
 17. For instances where main is located across the street from unit to be tapped, the Water Utility can provide a pushing service to get contractors copper from main to curb box location without open cutting the road. Call (732) 257-8314 for information and fee requirements.
 18. See enclosed diagram for meter installation & materials and E.B. Water Utility approved material specs.

For any further information contact the E.B. Water Utility at (732) 257-8314.



TYPICAL WATER SERVICE CONNECTION

N.T.S.

METER INSTALLATION REQUIREMENTS

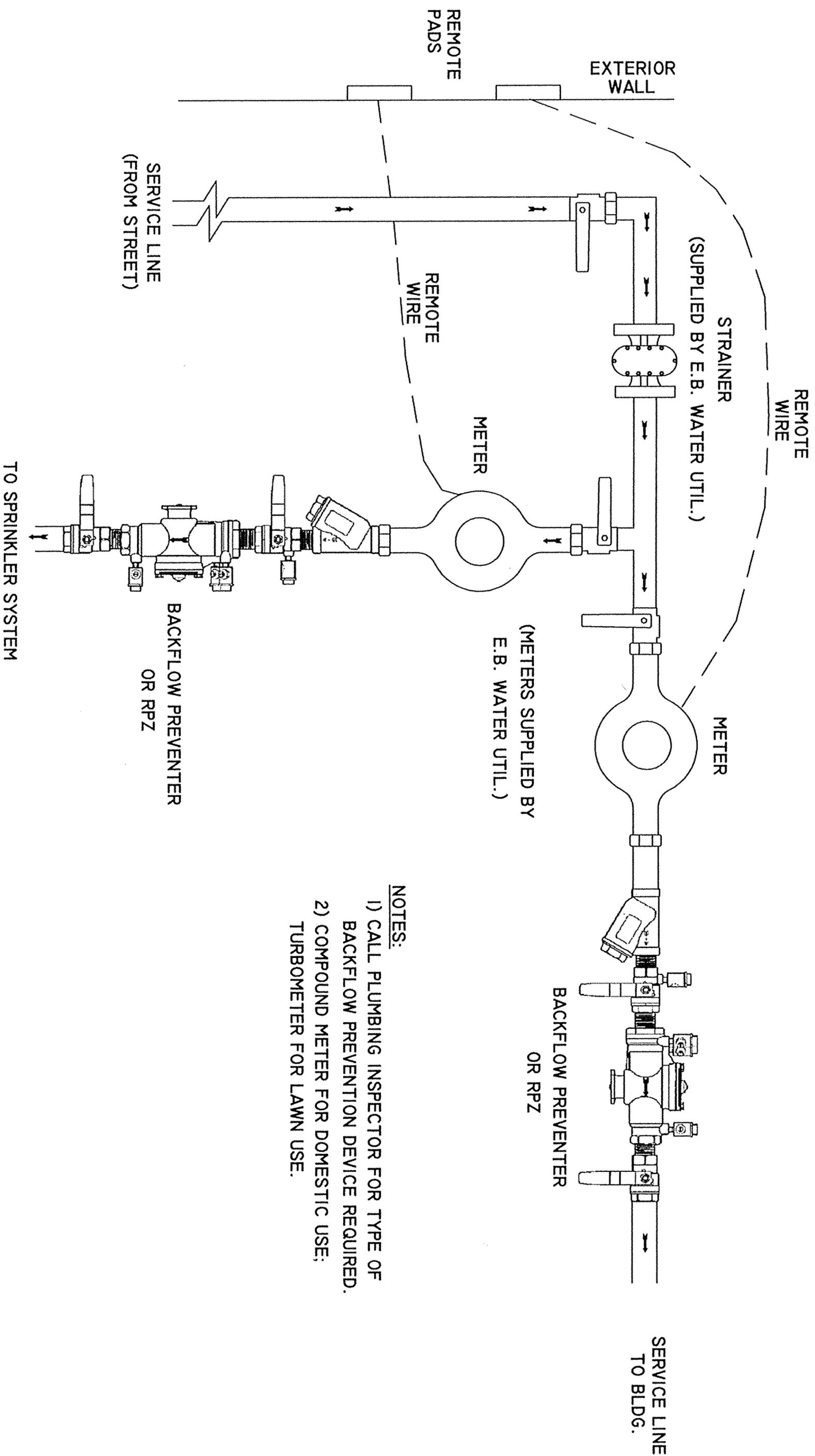
TYPICAL 1 1/2" & 2" DOMESTIC & LAWN SPRINKLER (DIAGRAM #1)

TYPICAL 1 1/2" & 2" DOMESTIC (DIAGRAM #2)

1. All fees to be paid prior to permits being issued, meters installed and accounts activated.
2. Meters to be installed in heated, lighted and ventilated area with adequate access for installer.
3. Meter to be installed as close to entry wall as possible.
4. All lines to be PVC sleeved as it comes through wall and sealed.
5. Depending on service size, 1 1/2 " or 2" ball valves to be installed as attached diagram specifies.
6. All meters to be installed horizontally.
7. All meters to be blocked from floor to meter or rodded and cradled to concrete floor.
8. No electrical outlets within 3' radius of meter.
9. For commercial or warehouse use, meters and valves must be locked, caged and/or bollards placed to prevent damage and tampering.
10. Outside Remote: .16 gauge, 3 connector wire to be installed to outside remote location by contractor. Meter installer will connect to meter and remote at time of installation. NOTE: for lawn & domestic accounts two (2) remote's to be installed, for domestic one (1) remote only.
11. Meters and strainer supplied by East Brunswick Water. After plumbing inspection call (732) 257-8314 for scheduling.
12. Call Plumbing Inspection at 732-390-6875 for inspections and type of back flow preventer needed for your specific application.

13. Call East Brunswick Water Utility for tapping scheduling.
- after fees paid (tapping & road opening)
 - contractor excavates
 - Utility supplies and installs tap
 - contractor installs "K" style copper from tap to curb box
 - call Engineering Inspection prior to back fill at 732-390-6870 with a 24 hour advance notice for inspections
 - from curb box to and including internal structure, call 732-390-6875 for inspection
 - for meter installation call Meter Division at 732-390-6826
 - see attached diagram and E. B. Water material spec list

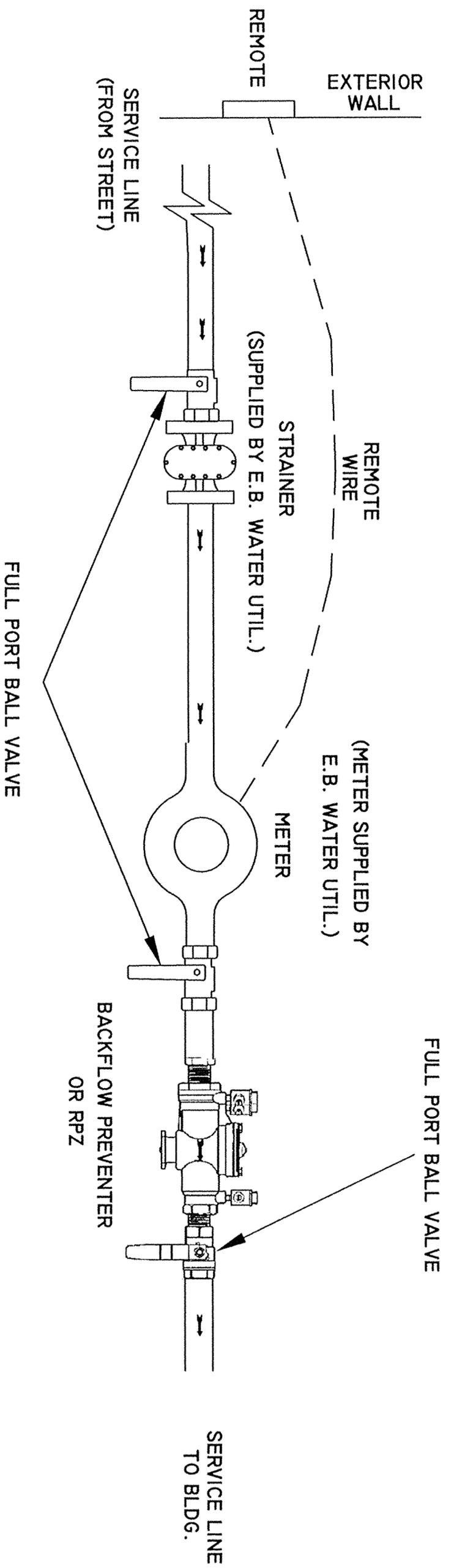
For any other information or questions, please call (732) 257-83147.



NOTES:

- 1) CALL PLUMBING INSPECTOR FOR TYPE OF BACKFLOW PREVENTION DEVICE REQUIRED.
- 2) COMPOUND METER FOR DOMESTIC USE; TURBOMETER FOR LAWN USE.

**TYPICAL 2" DOMESTIC SERVICE
WITH 2" OR 1 1/2" LAWN SPRINKLER**



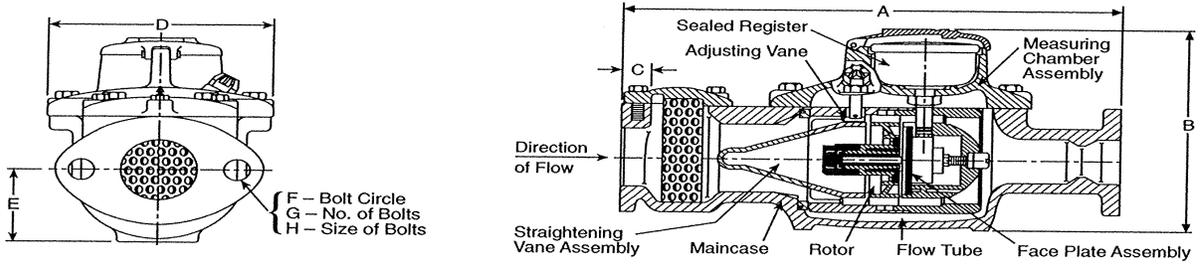
NOTES:

- 1) CALL PLUMBING INSPECTOR FOR TYPE OF BACKFLOW PREVENTION DEVICE REQUIRED.
- 2) COMPOUND METER FOR DOMESTIC USE;
- 3) BACKFLOW PREVENTOR, PIPING, AND BALL VALVES NOT SUPPLIED BY EAST BRUNSWICK WATER UTILITY.

**TYPICAL 2" DOMESTIC SERVICE
WITHOUT LAWN SPRINKLER**

Turbo Meters for Lawn Sprinklers

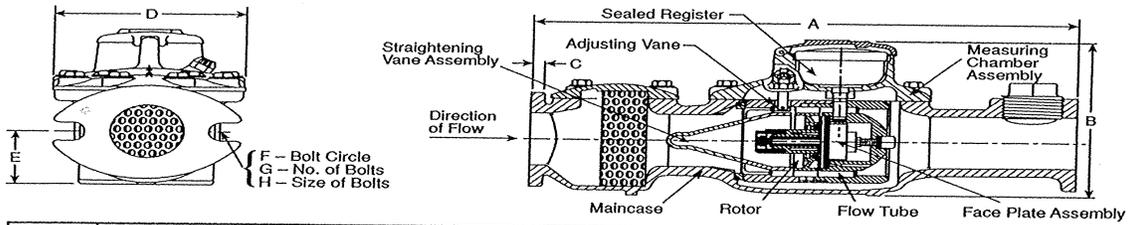
1 1/2" Turbo Meter



Meter and Pipe Size	Normal Operating Range GPM Minimum Maximum		Connections	Dimensions								Net Weight	Shipping Weight
				A	B	C	D	E	F	G	H		
1-1/2" DN 40mm	4 0.9m ³ /h	120 [Ⓞ] 27m ³ /h	Flanged	13"	6-1/2"	15/16"	6"	2-5/16"	4"	2	5/8"	26.5 lbs.	29.7 lbs.
				330mm	165mm	24mm	153mm	59mm	102mm	2	16mm		

Ⓞ For continuous flows; 160 GPM (36m³/h) maximum for intermittent flows.

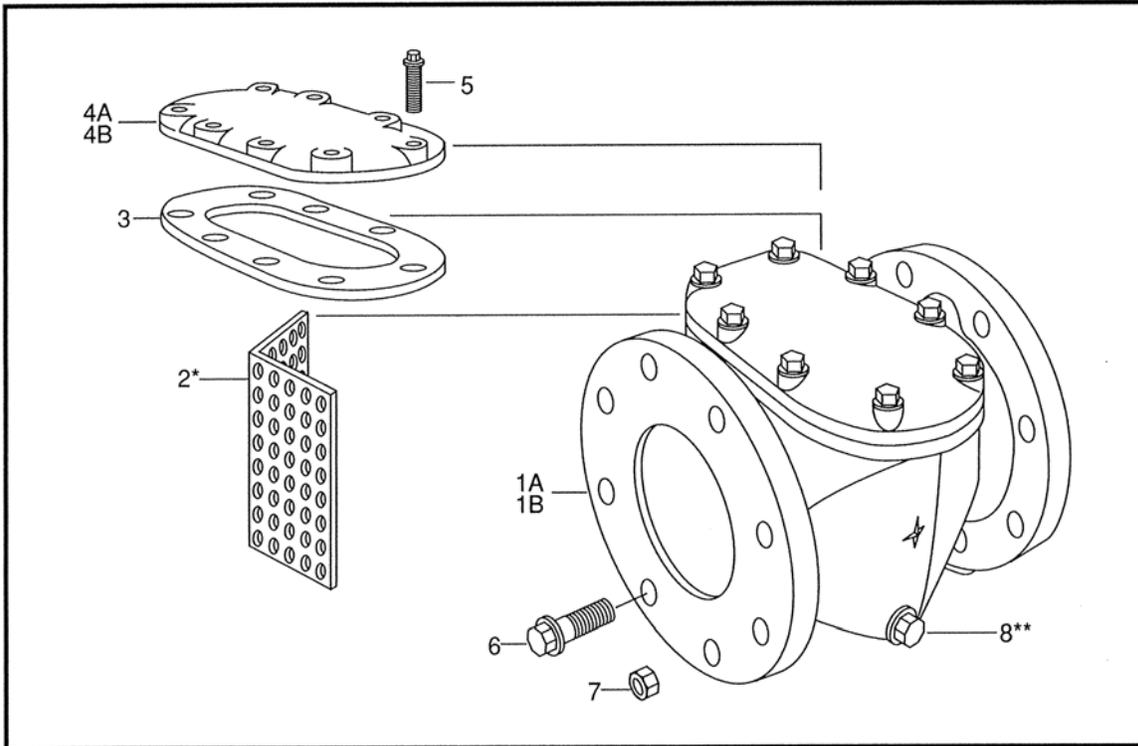
2" Turbo Meter



Meter and Pipe Size	Normal Operating Range GPM Minimum Maximum		Connections	Dimensions								Net Weight	Shipping Weight
				A	B	C	D	E	F	G	H		
2" DN 50mm	4 0.9m ³ /h	160 [Ⓞ] 36m ³ /h	Flanged	17"	6-3/4"	5/8"	6"	2-5/16"	4"	2	5/8"	40 lbs.	48 lbs.
				432mm	172mm	16mm	153mm	59mm	102mm	2	16mm		

Ⓞ For continuous flows; 200 GPM (45m³/h) maximum for intermittent flows.

Sizes 1-1/2", 2", 3", 4", 6", 8", 10" and 16" AWWA Type

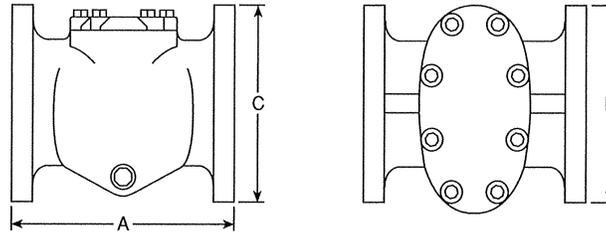


Ill. No.	Name of Part
1A	Body—Iron
1B	Body—Bronze
2*	Screen
3	Main Flange Gasket
4A	Cover—Iron
4B	Cover—Bronze
5	Cap Screw — Main Cover
6	Flange Bolt
7	Flange Nut
8**	Drain Plug—Bronze

- * Screen Configurations vary by size:
 1-1/2" - 10" - V-Shaped Screen (Perforated Stainless Steel)
 16" - Two-Piece Screen (Cast-Bronze)
 1-1/2" - 10" - Flanges are Threaded
 16" - Drilled Flanges-Require Nuts & Bolts
- ** Optional Drain Plugs (2) available on request. Sizes:
 1-1/2" - 3" - 1/2" - Plugs
 4" - 3/4" - Plugs
 6" - 1" - Plugs

Dimensions and Net Weights

Size	A Length	B Width	C Height	Weight
2" Bronze	7" (178mm)	6-5/16" (159mm)	4-3/4" (121mm)	12.2 lb. 5.5 kg.
3" Bronze	7" (178mm)	7-7/16" (190mm)	7-9/16" (192mm)	27 lb. 13 kg.
4" Bronze	9" (230mm)	9-1/2" (241mm)	9" (230mm)	50 lb. 23 kg.
6" Bronze	9" (230mm)	13-1/2" (343mm)	11-1/4" (286mm)	84 lb. 38 kg.
8" Iron	10" (245mm)	17" (432mm)	13-1/2" (343mm)	118 lb. 54 kg.
10" Iron	15" (381mm)	17-1/2" (445mm)	19" (482mm)	260 lb. 118 kg.
16" Iron	18" (457mm)	29" (737mm)	25" (635mm)	775 lb. 353 kg.



Pressure Drop

1-1/2"	2"	3"	4"	6"	8"	10"	16"
.7 psi at 120 gpm	.9 psi at 160 gpm	.9 psi at 350 gpm	2.5 psi at 1000 gpm	2.7 psi at 2000 gpm	2.5 psi at 3500 gpm	2.1 psi at 5500 gpm	1.8 psi at 10,000 gpm

Bolt Holes

2	2	4	8	8	8	12	16
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Flanges: 2" size, two-bolt oval, AWWA 125 pound class
3" through 16"; round, U.S. ANSI B. 16.1 class 125

Warranty

Invensys warrants its products only against defects in materials and workmanship. Invensys' liability and customer's exclusive remedy under this warranty or any warranty extends for a period of one (1) year from the date of Invensys' shipment and is expressly limited to repayment of the purchase price, repair or replacement, at Invensys' option, during said period, upon proof satisfactory to

Invensys and upon customer's returning and prepaying all charges on such products to factory or warehouse designated by Invensys. THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES; EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.



Invensys Metering Systems
P.O. Box 487
450 N. Gallatin Avenue
Uniontown, PA 15401
1-800-METER-IT
1-800-638-3748
FAX (Direct to Factory)
Local: (724) 439-7729
Toll Free: 1-800-888-2403
Web site: www.invensys.com
select North American Water
Email: h2oinfo@invensys.com

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