2.01 GENERAL

The Contractor shall furnish and install all water mains, valves, hydrants, fittings, corporation stops, house service piping and appurtenances as specified herein and as defined on the drawings or as directed by the Engineer. Provide all necessary adaptors for connection to existing mains. The Contractor is given the option of using ductile iron or PVC pipe. PVC pipe shall not be permitted for hydrant leads or inside of railroad steel crossing sleeves.

2.02 DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe shall be manufactured in accordance with ANSI/AWWA C151/A21.51, latest edition, and shall be thickness Class 50 in streets and inside highway sleeves and Class 56 under railroads unless otherwise noted. The Contractor shall have the option of furnishing mechanical or push-on joints conforming to latest edition of ANSI/AWWA C111/A21.11.

B. Pipe and fittings shall have an external standard asphaltic coating approximately one (1) mil thick.

C. Pipe and fittings shall have an internal cement lining in accordance with latest revision of ANSI/AWWA C104/A21.4. No bituminous coating shall be used on the inside of pipe and fittings unless prior written approval is obtained from the Delaware Division of Public Health.

D. All fittings and specials shall be gray-iron or ductile-iron with mechanical joint having a 250 psi pressure rating for gray-iron and 350 psi in the case of the ductile-iron. They shall be marked and manufactured in conformance with ANSI/AWWA C110/A21.10, latest edition. Compact ductile iron fittings will be an acceptable alternate. They shall be mechanical joint with a 350 psi pressure rating conforming to ANSI/AWWA C153/A21.53 and C111/A21.11.

2.03 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS

A. Polyvinyl chloride pipe shall meet the requirements of AWWA C-900. It shall be manufactured in standard length not exceeding twenty (20) feet and have an outside diameter equal to cast iron pipe. PVC pipe shall have standard dimension ratio (DR) of 18.0 or less. The pipe shall be rated for a working pressure of at least 150 psi.

B. Polyvinyl chloride (PVC) pipe shall be manufactured with an elastometric-gasket joint conforming to ASTM D 3139. Pipe ends shall be beveled.

C. Fittings for PVC water main shall be cast iron or ductile iron as specified in 2.02.

D. The Contractor shall provide all necessary adaptors for connecting PVC pipe to cast iron fittings and valves or other pipe lines. Adaptors shall be as recommended by the pipe manufacturer.

E. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets. Store pipe on flat surface. No stacking of pallets of random lengths above five (5) feet in height will be allowed. If pipe is stockpiled for more than thirty (30) days prior to installation in the trench, it must be suitably covered with reflective materials to protect the pipe from ultraviolet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

F. Bowed sections of pipe will not be acceptable and will not be allowed to be installed on this project.

2.04 POLYETHYLENE (PE) PIPE AND FITTINGS (FOR DIRECTIONAL BORES)

A. PE pipe shall be SDR11 plain end for fusion welding conforming to ASTM F 714 and ASTM D 3035. Minimum pressure rating shall be 160 psi.

B. Molded fittings will conform to ASTM F 714. End sections of PE piping in directional bore shall have an AWWA C-207 Class D flanged end butt. Fusion welded to PE main. Flange shall be drilled to standard 125 pound tenslate.

C. Terminal end of PC pipe shall be connected to continuing ductile iron or PVC pipe with a flanged expansion joint. The flanged expansion joint shall be a "FlexTend" flexible expansion joint as manufactured by EBAA, or approved equal.

2 .05 BORING AND JACKING OF WATER MAINS

A. Where possible, an approach trench shall be excavated far enough to provide a jacking face of at least three (3) feet from a pavement surface. This open face shall be shored securely to prevent slipping or raveling of the face.

B. Boring pits shall be large enough to contain all necessary equipment and tools. Adequate provisions shall be made for the removal of excavated material.

C. A substantial backstop of heavy timber or steel beams shall be provided to take the thrust of the jack or boring equipment.

D. As material is excavated or bored ahead of the pipe, the pipe shall be jacked in to follow this excavation. The distance dug ahead of the pipe shall not exceed six (6) inches.

E. The installation of casing pipe and the boring or excavation shall be done simultaneously.

F. Voids between the sleeve and excavation shall be filled by pressure grouting.

G. Cement grout shall be used to seal the pipe ends between the carrier pipe and sleeve.

H. A one (1) inch PVC pipe shall be installed in the downgrade seal to permit drainage.

I. Steel pipe sleeve shall be furnished in random lengths of the diameter shown on the plans and noted in the proposal and shall conform to the requirements of AWWA C-200; Grade B pipe shall be used. The pipe, including field connections, shall be coated with bitumastic compound, inside and outside. Pipe thickness for 18-inch diameter sleeve shall be 0.313 inches. 12-inch diameter sleeves shall be 0.250 inches thick. All joints for casing pipe shall be made by continuous weld completely around the perimeter of the pipe in accordance with AWWA C-206.

J. Carrier pipe shall be Class 50 ductile iron or polyvinyl choride AWWA C-900 at each location as required by the plans, except at railroad crossing, use Class 56 ductile iron pipe.

2.06 DIRECTIONAL BORE

A. The system must be remotely steerable and permit electronic monitoring of tunnel depth and location. The system must be able to control the depth and direction of the pipe and must be accurate to a window of +/- 2 inches.

B. The system must be capable of turning 90 degrees in a 35 foot radius.

C. The system shall utilize a fluid-cutting process, using a liquid clay such as bentonite. This clay must be total inert and contain no risk to the environment.

D. Liquid clay shall remain in the tunnel to increase stability of the tunnel and provide a lubricant to reduce frictional drag when the pipe is installed.

E. Spoils shall be recovered by use of a vacuum system mounted on a vehicle for removal of spoils to an approved spoils site. Spoils shall not be discharged into sewers or storm drains.

F. The equipment must be capable of completing the boring in a single bore.

G. Equipment must be fitted with a permanent alarm system capable of detecting an electrical current. The system will have an audible alarm to warn the operator when the drill head nears electrified cables.

2.07 GATE VALVES AND BOXES

A. Gate valves shall be resilient seat type, in accordance with AWWA C509. Valve bodies and bonnets shall be cast iron epoxy coated on the inside per AWWA C550.

B. Stem and wedge nuts shall be bronze. Stems shall be sealed by at least two (2) O-rings. Seals shall be replaceable with the valve fully open and while subject to the rated pressure.

C. Wedge shall be constructed of ductile iron, fully encapsulated in synthetic rubber, except for guide and wedge nut areas or it shall have a replaceable, internally reinforced, contoured molded rubber disc seat ring attached to the face of the wedge with self-locking, stainless steel screws. Wedge rubber shall be molded in place and bonded to the ductile iron portion. Wedge shall seat against accurately formed seating surfaces in the valve body.

D. Waterway shall be smooth and shall have no depressions or cavities in seat are where foreign material can lodge and prevent closure or seating.

E. Gate valves shall be manufactured by Waterous Company or Mueller.

F. Provide each gate with a 5 1/4-inch diameter Buffalo screw type valve box with "Water" cast in the lids. All boxes for 4, 6, and 8-inch valves shall be equipped with #6 round base. 10-inch valves shall be used with #8 valve box base. Valve boxes shall be adjustable between 2'-4" and 3'-4" except when deeper settings are required. Lids shall be extra deep and have two holes for removal of lid. Valve boxes shall be as manufactured by Mueller, or approved equal.

G. Provide socket valve operating wrenches.

2.08 TAPPING SLEEVE AND VALVE

A. Tapping sleeve shall be of all stainless steel construction including sleeve, bolts and nuts. Sleeves shall wrap 360° around the pipe with gridded full circumference gasket. Units shall be FAST Model by Ford Meter Box Company.

B. Tapping valves shall be cast iron, Clow Number F6114.

C. Install tapping sleeve and valve per manufacturer's recommendations.

2.09 FIRE HYDRANTS

A. Fire hydrants shall be per City of Milford Standards. Hydrants shall be compression type with a 5 1/4- inch main valve opening, two 2 1/2-inch hose nozzles, one 4 1/2-inch pumper nozzle, and a 6-inch mechanical joint hub base. Hydrant seats shall be provided with bronze to bronze threaded connections.

B. All nozzle and steamer threads shall conform to National Standard. Hydrants shall be of proper length for a 4-foot trench depth or as required by field conditions and be Mueller Model A-442 Modern Centurian, Kennedy K-81D Guardian, or equal. They shall meet requirements of AWWA Standard C-502.

C. A sworn certificate of inspection and testing shall be furnished by the manufacturer. Install hydrants with restraint system as detailed on the drawings, or with a hydrant tee.

D. All hydrants to be furnished with non-kinking chains on the 2 1/2- inch nozzles.

E. Hydrants shall open by turning the operating nut counter-clockwise.

F. Fire hydrants to receive one (1) coat of primer and two (2) coats of chrome yellow paint in accordance with Federal Standard 595A. The final coat shall be field applied after the hydrant has been installed. The color of the hydrant tops to be determined by pressure test. Coordinate with the City of Milford.

G. Provide hydrant operating wrenches and repair kits.

2.10 LAYING WATER MAINS, FITTINGS AND APPURTENANCES

A. Water main pipe, fittings, and valves shall be installed per manufacturer's printed instructions. Care shall be taken to insure that no joints are made with unevenness or rough edges. Pipeline deflection must be kept below the manufacturer's limitations.

B. All pipes shall be bedded on a solid foundation prior to backfilling. Defects due to settlement shall be corrected by the Contractor at his own expense. Bell holes shall be dug sufficiently large to receive same.

C. Pipe and fittings shall be kept clean until final acceptance of the work. All open pipe ends shall be provided with plugs to keep dirt, water and other materials from entering. This plug shall be kept in place when actual pipe laying is not in progress.

D. Excavation and backfill for water mains and appurtenances shall be per Section 1 of these specifications.

E. PVC pipe shall be beveled before making pipe joint.

F. Install no pipe on frozen or frost penetrated subgrade. When directed, the Contractor shall install pipe on artificial foundations. Such foundation may consist of gravel or concrete and shall be to the dimensions and in the manner directed by the Engineer.

G. Pipeline detectable tape shall be installed continuously along all PVC water mains. The tape shall be installed directly above the water main and twelve (12) inches from the ground surface. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard, Inc., of Wheaton, Illinois, or equal. The tape shall be a minimum of two (2) inches wide, blue in color, imprinted with the words "CAUTION--WATER LINE BELOW," and be capable of being detected with inductive methods.

H. All concrete required to construct buttresses behind plugs, tees, bends and other fittings and anchorages beneath vertical bends shall be placed as directed and/or as shown on the details.

2.11 INSTALLING FITTINGS, HYDRANTS, GATE VALVES AND VALVE BOXES

A. Fittings, hydrants, gate valves and valve boxes shall be placed along the water mains at the locations indicated on the drawings or where otherwise designated by the Engineer.

B. A valve box shall be carefully placed over the bonnet of each gate valve with the top at the finished surface of the street, sidewalk or at such other elevation as the Engineer shall direct. It shall be set exactly plumb. In tamping the backfill around the box, special care shall be taken to keep the box plumb and to have it firmly supported on two, 4-inch thick solid concrete blocks so as to avoid settlement. Any box which is found out of plumb, or which is not firmly supported, shall be excavated and reset in a satisfactory manner, at the Contractor's expense. Place gravel in and around valve box bases to provide for drainage.

C. Ductile iron pipe with cast iron or ductile iron fittings shall be used exclusively throughout the hydrant assembly. The use of polyvinyl chloride pipe will not be permitted in

construction of any portion of the hydrant leads.

2.12 DISINFECTION OF WATER MAINS

A. Upon completion of water main construction, disinfect main and appurtenances. Disinfection shall be done in accordance with ANSI/AWWA C-601, latest edition. Contractor shall submit a plan of disinfection for approval by the Engineer.

B. After the applicable retention period, the heavily chlorinated water shall be flushed from the main. This water shall be discharged to the sanitary sewer system. Only after water leaving the main is no higher in chlorine concentration than normal drinking water, will a discharge to storm drains be allowed. Convey flushed water to discharge point in a closed system.

C. Affidavits of compliance, certifying the water sampled from the water mains to be free of coliform bacteria, shall be submitted to the Engineer. The Contractor is responsible for requesting tests from the Delaware Department of Public Health. He shall provide written documentation when a sectlon of mains can be placed in service.

D. The Contractor shall place in each length of pipe, hydrants, hydrant branches, and other appurtenances, a sufficient amount of HTH tablets to insure adequate disinfection treatment of the main after its completion. Tablets shall be fastened to the inside top of every length of pipe as laid, using gasket cement known as "Permatex No. 2".

E. The Contractor will be held entirely responsible for securing a minimum residual chlorine content of 5 p.p.m. at the extremities of the mains after twenty-four (24) hours or more contact with the full water pressure on the main.

F. Water for filling the mains shall be introduced at a velocity of less than one (1) foot per second in order to permit the HTH or Perchloron to completely dissolve and have a reasonable uniform distribution throughout the mains. It is the intent of this Specification to require a sufficient amount of chemical to be equivalent to a dosage of 50 p.p.m. of chlorine.

G. After the chlorine has been in contact with the mains or storage units for twenty-four (24) hours or longer, samples collected from the extremities of the mains shall indicate a residual chlorine content of 5 p.p.m. or more.

H. If less than 5 p.p.m. residual chlorine is indicated, the system shall be drained and the disinfection treatment repeated.

I. If samples collected at the extremities indicate a residual chlorine of 5 p.p.m. or more, the system shall be flushed until there is only a normal chlorine residual (1.0 p.p.m. or less) present, as determined by the DPD Method Test. Samples of water shall be collected from various points along the lines, by the State Board of Health for bacteriological analysis. If satisfactory bacteriological results are obtained, the lines may then be allowed to be placed in service. A copy of all test results shall be submitted to the Engineer.

2.13 WATER MAIN TESTING

A. The Contractor shall furnish all equipment, labor and materials, including water, pumps, compressors, stopwatch, gauges, and meters as approved by the Engineer for testing. The Engineer shall determine the amount of main to be tested at anyone time and reserves the right to separate the installation into several test sections. All tests must be witnessed by the Engineer or Owner.

B. Pressure Test

After the pipe has been laid, all newly laid pipe or any valved section thereof, shall be subjected to a hydrostatic pressure of 100 psi.

1) Test Pressure shall:
   a. Be of at least two hour duration.
   b. Not vary by more than ± five psi.

2) Pressurization:
Each valved section of pipe shall be filled with water slowly and the specified test pressure, based on the elevation of the lowest point of the line or section under the test and corrected to the elevation of the test gauge shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Owner.

3) Air Removal:
Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points, so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, all corporation cocks shall be removed and plugged, or left in place at the discretion of the Owner.

4) Examination:

All exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, or hydrants that are discovered following the pressure test shall be repaired or replaced with same material and the test shall be repeated until it is satisfactory to the Owner.

C. Leakage Test

A leakage test shall be conducted concurrently with the pressure test.

1) Leakage Defined:
Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or at any valved section thereof, to maintain pressure within five psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

2) Allowable Leakage:
No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND\sqrt{P}}{7400}$$

in which L is the allowable leakage, in gallons per hour; N is the number of joints in the length of pipe line tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch gage.

Allowable leakage at various pressure is shown in Table I (appearing after this Subsection).

3) When hydrants are in the test section, the test shall be made against the closed hydrant.

D. Should the tests show the main to be defective, the Contractor shall remedy such defects and retest the main as specified above. This procedure shall be repeated until the test requirements are met.

TABLE I

Allowable Leakage per 1000 feet of Pipeline* - gph						
Avg. Test Pressure psi	Nominal Pipe Diameter - Inch					
	2	3	4	6	8	10
150	0.19	0.28	0.37	0.55	0.74	0.92
125	0.17	0.25	0.34	0.50	0.67	0.84
100	0.15	0.23	0.30	0.45	0.60	0.75

**For pipe with 18-ft nominal lengths. To obtain the recommended allowable leakage for pipe with 20-ft nominal lengths, multiply the leakage calculated from the table by 0.9. If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size*.

2.14 SERVICE PIPE AND APPURTENANCES

A. GENERAL

1) For all new residential or commercial developments currently not served by the City of Milford, the Contractor is responsible for furnishing and installing all corporation stops, house service pipe, or prefabricated meter setters, covers, valves and appurtenances as indicated on the drawings, and specified herein. Meter setters and lids shall accommodate radio-read.

The Contractor will provide a main tap complete with corp stop for all new residential or commercial developments in areas already served by the City of Milford. The service will be stubbed out to the R.O.W. line from where it becomes the property owner's responsibility.

The meter setters installed by the Contractor shall accommodate the following meters for installation by Owner.

a. Single family residential hook-ups Hersey 5/8" x 3/4" Model 430.
b. Multi family, apartment, light commercial hook-up Hersey 1" meter Model 452.
c. Commercial hook-up 2" Hersey meter Model MVR.

2) The Contractor shall provide all tools, equipment and accessories required for tapping ductile iron and polyvinyl chloride water mains and installing water services. All underground service lines, valves and fittings shall conform to ANSI/AWWA C800-84.

3) Detectable tape, approved by the Engineer, shall be placed directly over all water services during backfilling operation, so magnetic detection of service lines may be utilized in the future, by Owner.

B. HOUSE SERVICE

1) Standard Water service lines shall be polyethylene, 1-inch diameter. SDR-9 copper tube size unless otherwise shown on the plans. Service lines shall conform to AWWA C901 and ASTM D-2737.

2) For tapping ductile iron pipe and PVC pipe use Ford, series FRS202 stainless steel tapping sleeve with one (1)-inch CC thread. Use Teflon tape for threaded service connections. Do not torque saddles or sleeves, without water pressure, in main.

3) Corporation stops shall be one (l)-inch, Mueller Model B-25008. Install stainless steel liners at connection to service lines. Liners shall be Mueller Part No. 504385. The Contractor shall furnish and install liners wherever a compression connection is used on plastic service lines.

4) Cutting tools shall be of the hollow, shell bit type for removal of pipe plug. For tapping PVC mains, use only Mueller Plastic Cutting Tool. On closely spaced taps for townhouse developments, place corporation stops as recommended by pipe manufacturer. Furnish saddles with standard AWWA corporation stop inlet thread. Saddles shall be Ford stainless steel double strapped type FRS202 or approved equal.

5) Prefabricated 18" x 30" PVC meter box assemblies shall be Model PSBH-288-18-36 as manufactured by Ford Meter support shall be by a lateral PVC brace. Check valve shall be Ford HA 31-323 or approved equal. System shall also include an angle ball valve with lock wings. Valve shall be Ford BA13-232W or approved equal. Couplings for connection shall be 3/4" F.I.P. x 1" P/J C.T.S. Ford C-14-34 with stainless inserts or approved equal.

6) Cover frames shall be installed in non-traffic areas only. Lids shall be polylids as manufactured by Mid-States Plastics, Inc., model MSIL1, to facilitate electronic reading. Lids shall have the word "Water Meter" cast into the cover and include lifter worm locks. Supply meter box lid wrenches. Contractor shall verify fit and compatibility of assembly components prior to ordering. All assemblies shall be suitable for 5/8" x 3/4" Hersey radio-read meters as furnished, and installed by the City of Milford. Cover frames shall be Ford Model A32.

7) Meter pits shall be installed on the front property line, as close as possible to the center of the lot in new construction. A minimum separation distance of ten (10) feet shall be maintained between meter pits and sewer cleanouts, and also water service lines and sewer laterals.

C. COMMERCIAL SERVICE

1) All service lines larger than one (1)-inch diameter shall be two (2)-inch Schedule 80 PVC threaded service pipe or two (2)-inch diameter, SDR-9 copper tube size polyethylene tubing.

2) For tapping ductile iron and PVC pipe use Ford, series FRS202 stainless steel tapping sleeve with two (2)-inch CC thread. Use Teflon tape for threaded service connections. Do not torque saddles or sleeves, without water pressure, in main.

3) Use Mueller two (2)-inch CC thread corporation stop, model B25008.

D. GANG METER PITS (Up to Five (5) Meters)

1) All service lines connecting gang meter pits to water mains shall be two (2)-inch schedule 80 PVC threaded service pipe or two (2)-inch diameter, SDR-9 copper tube size polyethylene tubing. The manifold in the pit shall be schedule 80 PVC pipe. The service pipes downstream of the pit shall be P.E. SDR-9, one (l)-inch diameter.

2) The gang meter shall be installed in a precast concrete meter pit by Penn-Cast Products, Inc. Model #440 as shown on plan, top section only. The service pipe or tubing has to be installed in a sleeve.

3) For tapping ductile iron pipe and PVC pipe use Ford, series FRS202 stainless steel tapping sleeve with two (2)-inch CC thread. Use Teflon tape for threaded service connections. Do not torque saddles or sleeves, without water pressure, in main.

4) Corporation stop shall be Mueller two (2)-inch model B-25008 with CC thread, or approved equal.

5) The setting shall be as detailed on the plans. For each meter in the pit use Ford yoke 502P, Ford straight yoke ball valve B91-324, Ford straight yoke check valve HS91-323 and a Ford expansion connection EC-23-W couplings for connecting to service tubing shall be 3/4" M.I.P. x 1"P/J C.T.S., Ford C-84-34.

6) Cover shall be Ford MC-36 with twenty (20)-inch lid and thirty-six (36) inch inside diameter.

7) Drill 2" hole on house side of pit, 6" below underside of top slab, centered in the wall to accommodate wiring to building for electronic meter readings.

8) For gang pits of more than five (5) meters see special City detail sheet.

E. LAYING SERVICE PIPE AND APPURTENANCES

1) All service pipe shall be carefully inspected for damaged areas. All damaged pipe shall be cut out and recoupled. Pipe installed during hot weather shall be allowed to contract to normal length before backfilling. Pipes and fittings shall be bedded on a solid foundation.

2) Fittings and valves shall be kept clean, handled carefully and installed according to the manufacturer's recommendations.

3) All new service lines shall be installed as directed by the Engineer.

4) Service lines in streets shall be installed by open cutting or with an underground piercing tool such as an ACCU-punch or equal. Maximum diameter of piercing tool to be 2 1/2-inches. Based on bids received, the Owner may adjust the

quantity of the various types of service installation or eliminate the use of the piercing tool as is in his best interest.

5) Installation of services by piercing tool shall be performed with all necessary devices to assure alignment accuracy. Such devices shall include a magnetic level, launcher, and aiming frame. The Contractor shall demonstrate installation procedures to the Engineer and the DOT for approval prior to use.

6) Service connections and meter boxes shall be installed immediately after the construction of the adjacent main. Postponement after the construction of service lines will not be allowed.

7) Requirements for sterilization and pressure testing of service connections shall be the same as specified for mains in this specification.

8) The Contractor is responsible for locating existing services, cutting and reconnect ion with all necessary adaptors or sleeves, within the unit price bid for service lines. The Contractor shall obtain and pay for then services of a licensed plumber if required by code.

END OF SECTION

DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		STANDARD SINGLE METER PIT DETAIL(PREFABRICATED) NO SCALE
		SECTION - 2 / DRAWING: D2-1

CITY OF MILFORD
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
CONSTRUCTION STANDARDS

DATE:

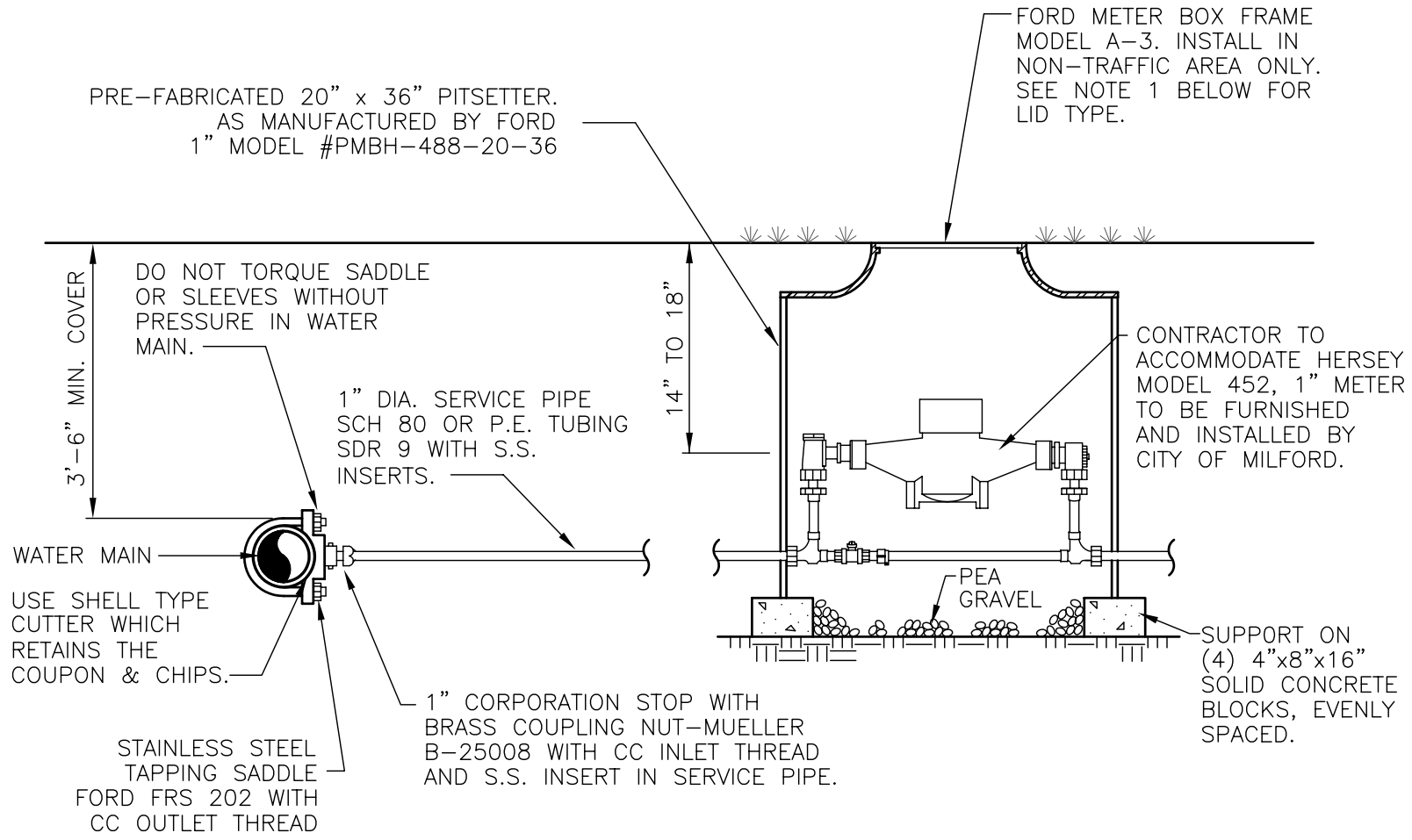
REVISION NO.:

APPROVED:

1" WATER METER SERVICE CONNECTION NO SCALE

SECTION - 2

DRAWING: D2-2



NOTES:
1. INSTALL POLY LID AS MANUFACTURED BY MID-STATES PLASTICS, INC., MODEL MSIL1.
2. WRAP ALL THREAD WITH TEFLON TAPE.
3. INSTALL METER PIT IN NON-TRAFFIC AREA ONLY.
4. METER SHALL BE RADIO-READ.

CITY OF MILFORD
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
CONSTRUCTION STANDARDS

DATE:

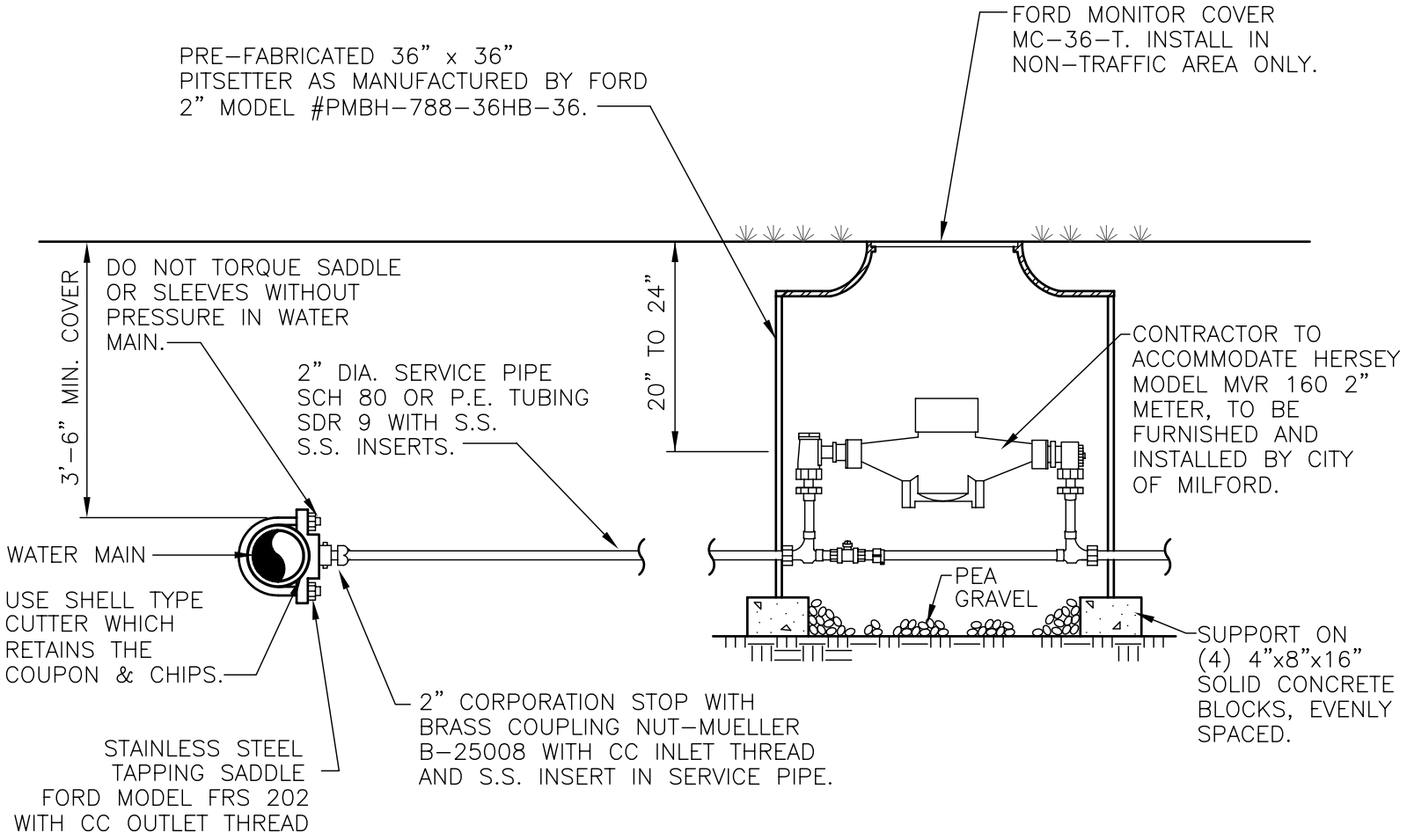
REVISION NO.:

APPROVED:

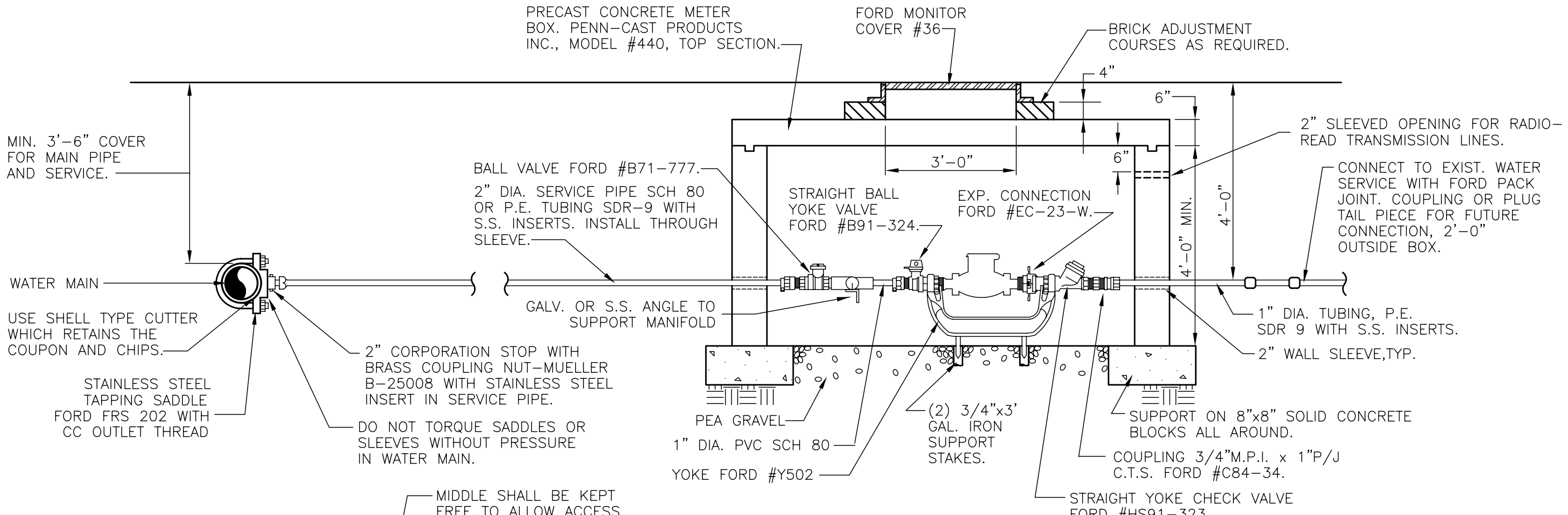
2" WATER METER SERVICE CONNECTION NO SCALE

SECTION - 2

DRAWING: D2-3

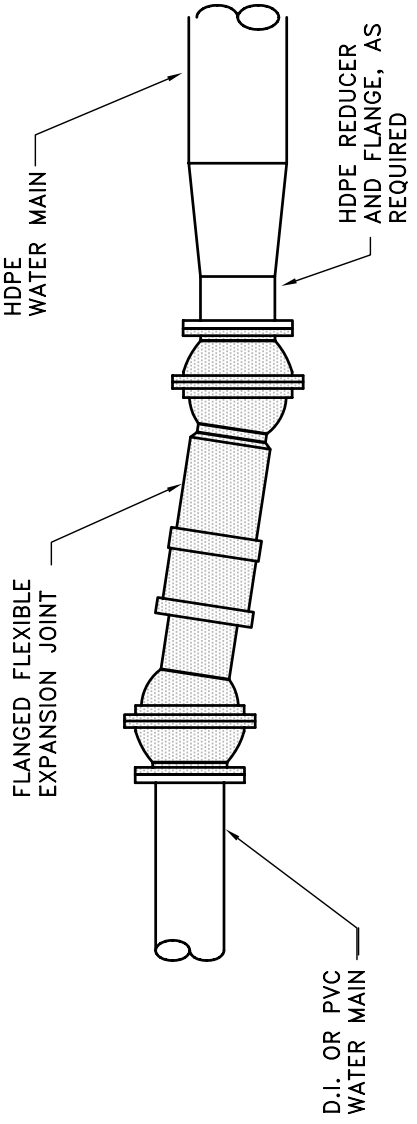


NOTES:
1. WRAP ALL THREAD WITH TEFLON TAPE.
2. INSTALL METER PIT IN NON-TRAFFIC AREA ONLY.
3. METER SHALL BE RADIO READ.



NOTE:
1. ACCESS FRAME AND COVER SHALL BE CENTERED OVER PIT.
2. ALL OPENINGS SHALL BE SLEEVED.
3. CAST 2" SLEEVED HOLE IN BACK WALL OF PIT (CLOSEST TO PROPOSED BUILDING). CENTER HOLE VERTICALLY, 6" BELOW THE UNDERSIDE OF TOP SLAB, AND CENTER HORIZONTALLY IN BACK WALL.
4. CONTACT THE CITY OF MILFORD FOR INFORMATION REGARDING LARGER PITS.

DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		GANG WATER METER PIT DETAIL NO SCALE
		SECTION – 2 / DRAWING: D2–4



NOTE: EXPANSION JOINT SHALL BE "FLEXTEND" AS MANUFACTURED BY EBAA, OR APPROVED EQUAL.

DIRECTIONAL BORE
TERMINAL END EXPANSION JOINT

DATE:	REVISION NO.:	APPROVED:	
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		DIRECTIONAL BORE TERMINAL END EXPANSION JOINT NO SCALE	
		SECTION - 2	DRAWING: D2-5

CITY OF MILFORD
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
CONSTRUCTION STANDARDS

DATE:

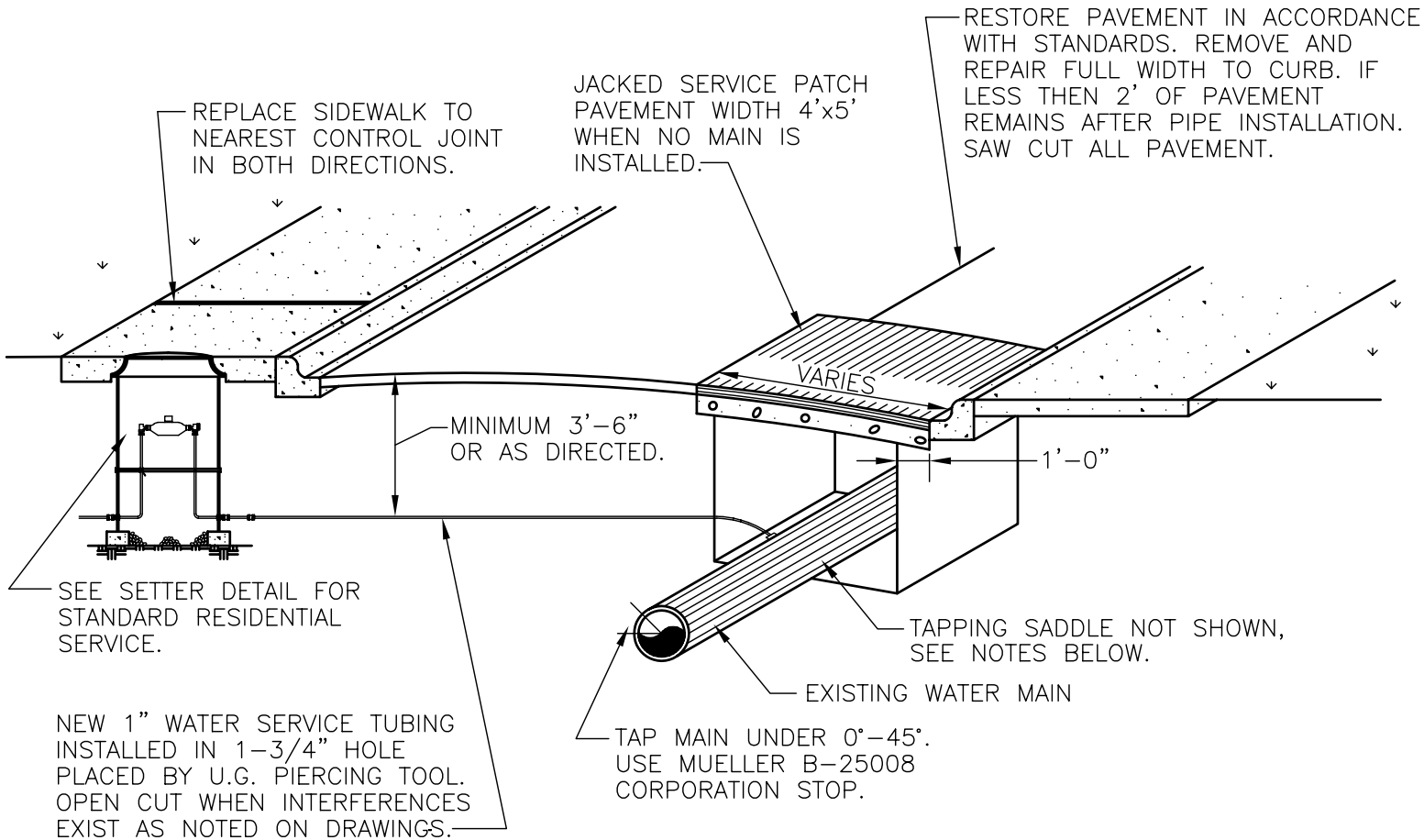
REVISION NO.:

APPROVED:

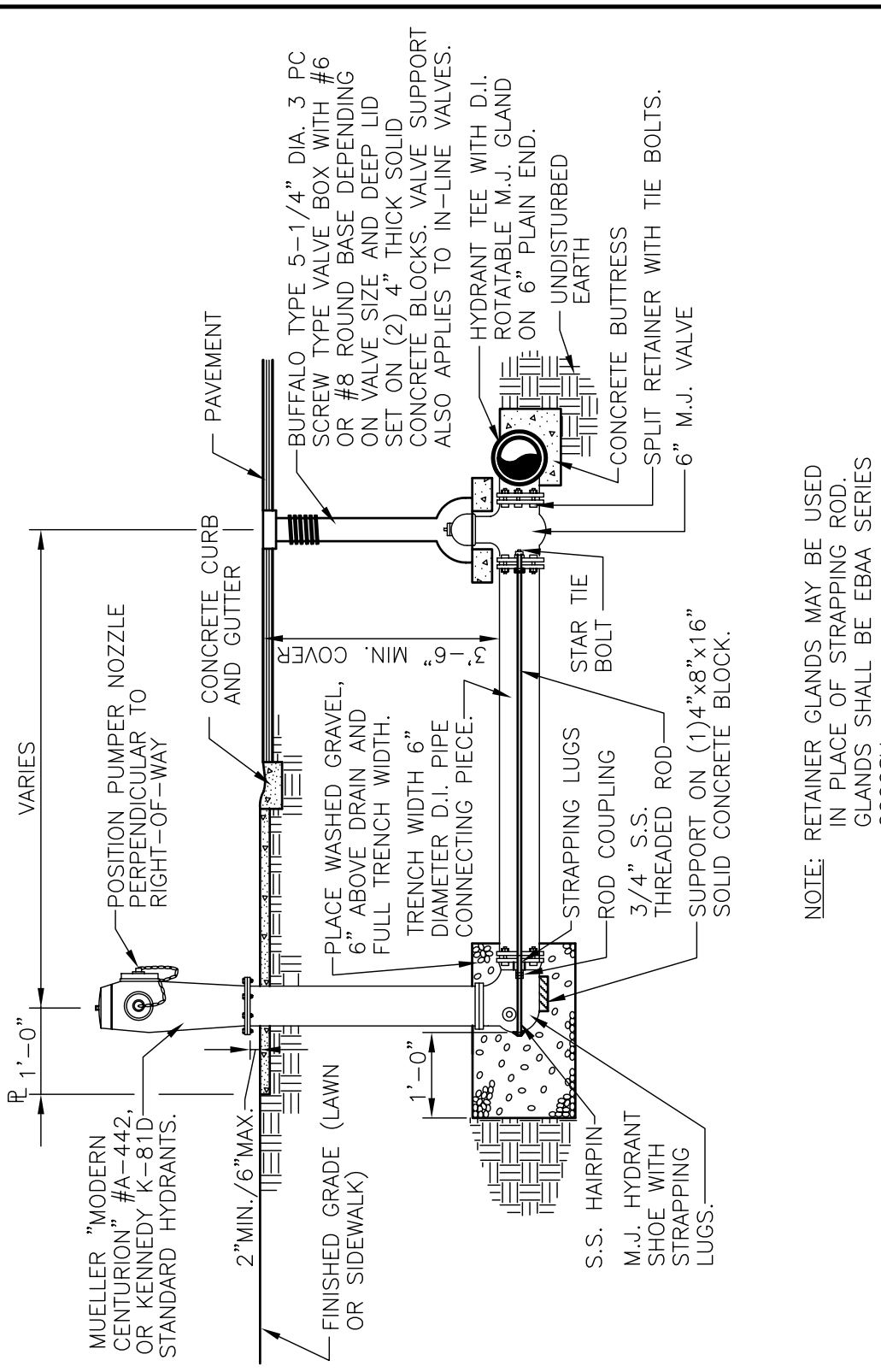
MOLED WATER SERVICE AND
RESTORATION DETAIL
NO SCALE

SECTION - 2

DRAWING: D2-6

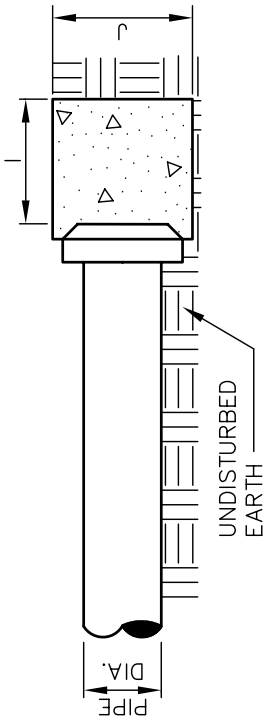


NOTES:
1. INSTALL STAINLESS STEEL TAPPING SADDLE, FORD FRS 202 WITH CC OUTLET THREAD.
2. INSTALL 1" CORPORATION STOP WITH BRASS COUPLING NUT IN SADDLE, MUELLER B-25008 WITH CC INLET THREAD AND S.S. INSERT IN SERVICE PIPE. USE SHELL TYPE CUTTER WHICH RETAINS THE COUPON AND CHIPS.
3. DO NOT TORQUE SADDLE OR SLEEVES WITHOUT PRESSURE IN WATER MAIN.

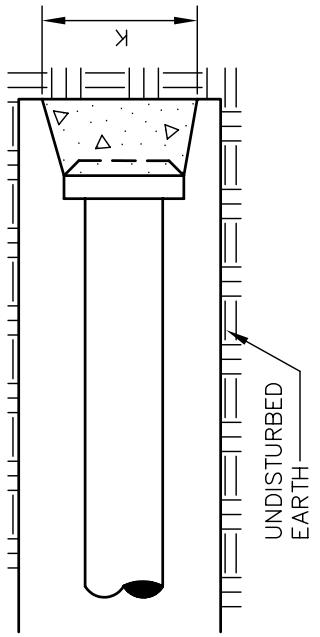


NOTE: RETAINER GLANDS MAY BE USED IN PLACE OF STRAPPING ROD. GLANDS SHALL BE EBAA SERIES 2000SV.

DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		FIRE HYDRANT DETAIL NO SCALE
		SECTION - 2 / DRAWING: D2-7



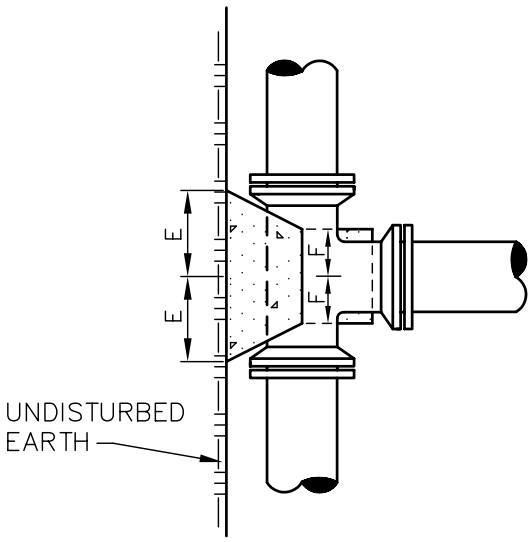
PROFILE



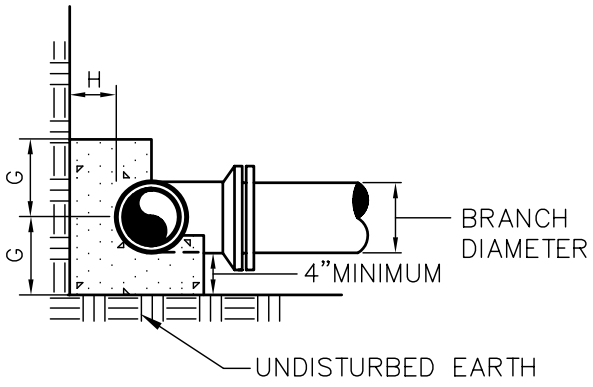
PLAN

DIMENSION SCHEDULE						
PIPE DIA.	6"	8"	10"	12"	16"	
I	6"	8"	8"	10"	1'-0"	
J	1'-0"	1'-4"	1'-8"	2'-0"	2'-8"	
K	1'-5"	1'-11"	2'-5"	2'-10"	3'-9"	

DATE:	REVISION NO.:	APPROVED:	
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		PLUG DETAIL NO SCALE	
		SECTION - 2	DRAWING: D2-8



PLAN



PROFILE

DIMENSION SCHEDULE					
BRANCH DIA.	6"	8"	10"	12"	16"
E	8"	10"	1'-0"	1'-3"	1'-8"
F	6"	8"	8"	8"	10"
G	7"	9"	1'-0"	1'-2"	1'-6"
H	8"	9"	10"	1'-0"	1'-2"

DATE:	REVISION NO.:	APPROVED:	
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		TEE AND WYE DETAIL NO SCALE	
		SECTION - 2	DRAWING: D2-9

CITY OF MILFORD
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
CONSTRUCTION STANDARDS

DATE:

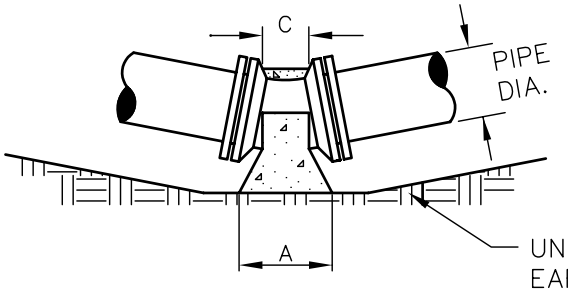
REVISION NO.:

APPROVED:

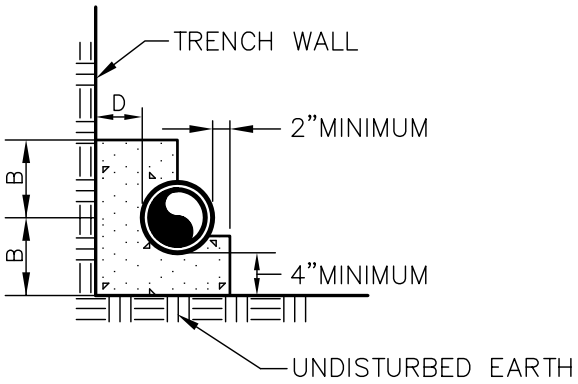
HORIZONTAL BEND DETAIL
NO SCALE

SECTION - 2

DRAWING: D2-10



PLAN



PROFILE

DIMENSION SCHEDULE										
BEND	11 1/4°					22 1/2°				
PIPE DIA.	6"	8"	10"	12"	16"	6"	8"	10"	12"	16"
A	6"	6"	10"	1'-0"	1'-4"	9"	1'-0"	1'-6"	1'-9"	2'-3"
B	7"	8"	9"	10"	1'-0"	7"	8"	9"	10"	1'-0"
C	4"	6"	6"	10"	1'-0"	4"	6"	8"	10"	1'-0"
D	7"	7"	8"	8"	9"	8"	9"	10"	11"	1'-2"
BEND	45°					90°				
PIPE DIA.	6"	8"	10"	12"	16"	6"	8"	10"	12"	16"
A	1'-3"	1'-8"	2'-1"	2'-6"	3'-4"	2'-0"	2'-6"	3'-0"	3'-6"	5'-0"
B	7"	8"	9"	1'-1"	1'-3"	6"	9"	1'-0"	1'-3"	1'-6"
C	4"	6"	8"	10"	1'-0"	4"	6"	8"	10"	1'-0"
D	8"	9"	10"	11"	1'-2"	1'-5"	1'-7"	1'-8"	1'-9"	1'-10"

CITY OF MILFORD
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
CONSTRUCTION STANDARDS

DATE:

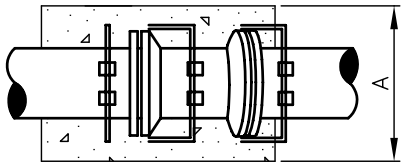
REVISION NO.:

APPROVED:

VERTICAL DOWNWARD BEND DETAIL
NO SCALE

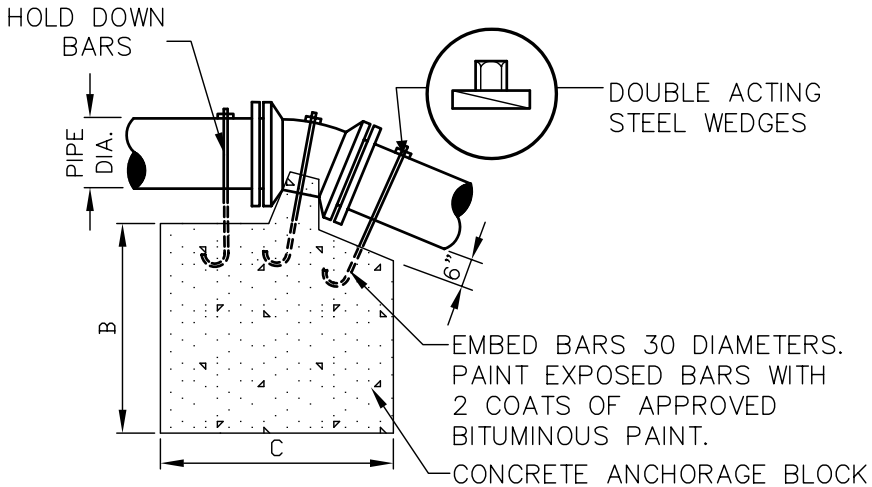
SECTION - 2

DRAWING: D2-11



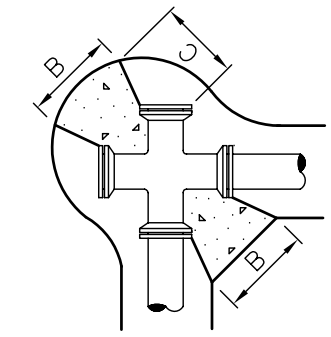
PLAN

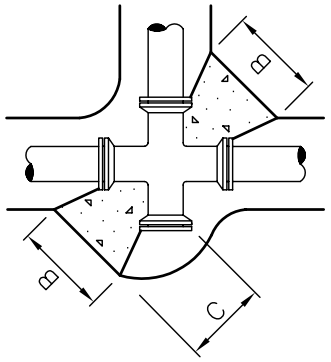
DIMENSION SCHEDULE						
BEND		PIPE DIAMETER				
		6"	8"	10"	12"	16"
11 1/4°	A	1'-6"	1'-6"	2'-5"	3'-0"	1'-4"
	B	1'-3"	1'-9"	1'-9"	2'-0"	1'-0"
	C	2'-0"	2'-6"	2'-9"	3'-0"	4'-0"
22 1/2°	A	2'-0"	3'-4"	3'-8"	4'-0"	4'-4"
	B	1'-9"	2'-3"	2'-6"	2'-6"	2'-6"
	C	2'-6"	2'-8"	3'-10"	4'-0"	5'-6"
45°	A	2'-6"	3'-0"	4'-0"	4'-6"	5'-2"
	B	2'-6"	2'-9"	3'-0"	3'-6"	4'-6"
	C	3'-0"	4'-0"	4'-6"	4'-9"	8'-0"

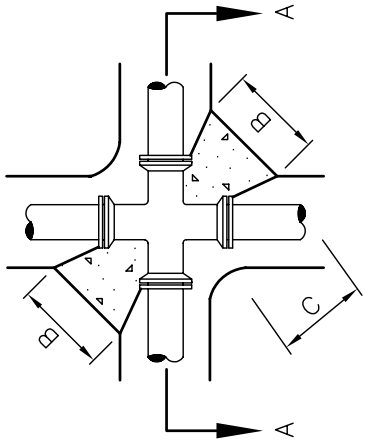


PROFILE

BAR SCHEDULE			
SIZE	REINFORCING BARS		
	11 1/4°	22 1/2°	45°
6"	3 #6	3 #6	3 #6
8"	3 #6	3 #6	3 #6
10"	3 #6	3 #6	3 #6
12"	3 #6	3 #6	3 #6
16"	3 #6	3 #6	3 #6

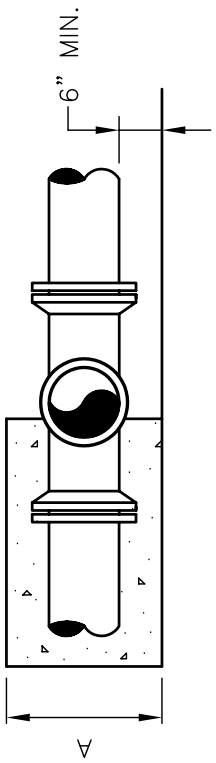






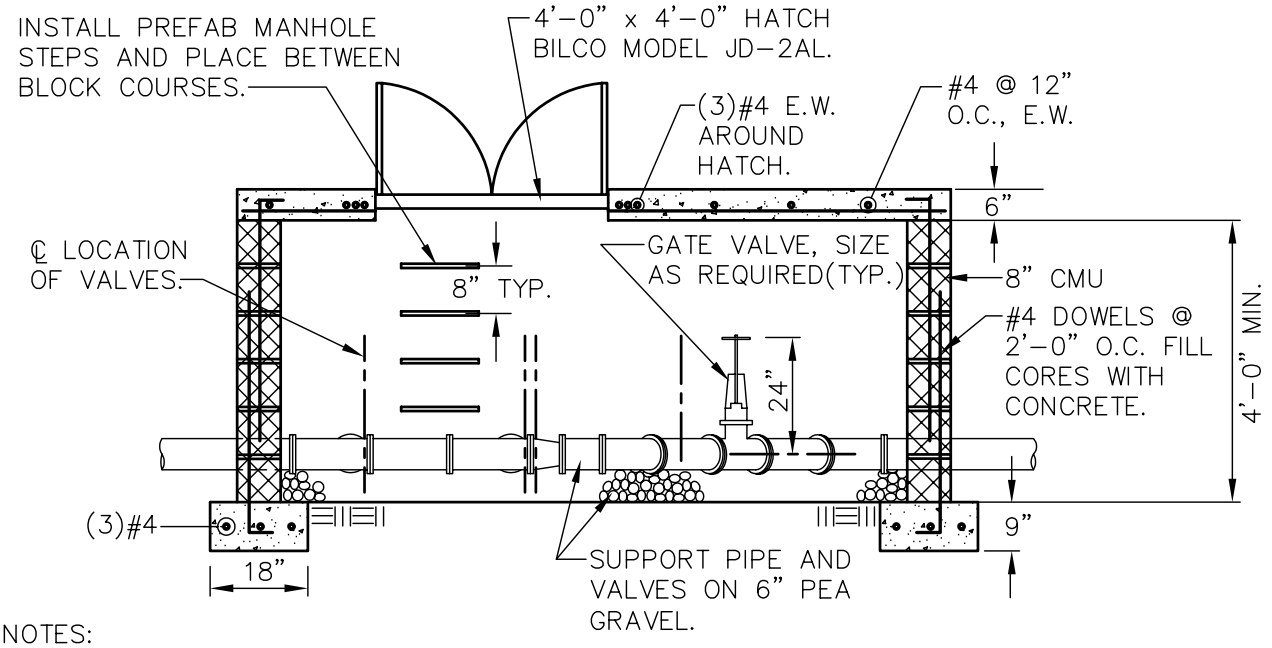
PLAN VIEW

DIMENSION SCHEDULE			
LARGEST BRANCH DIA.	6"	8"	10"
A	1'-9"	2'-6"	3'-0"
B	1'-2"	1'-4"	2'-0"
C	2'-6" MIN. OR TO UNDISTURBED SOIL.		



SECTION A

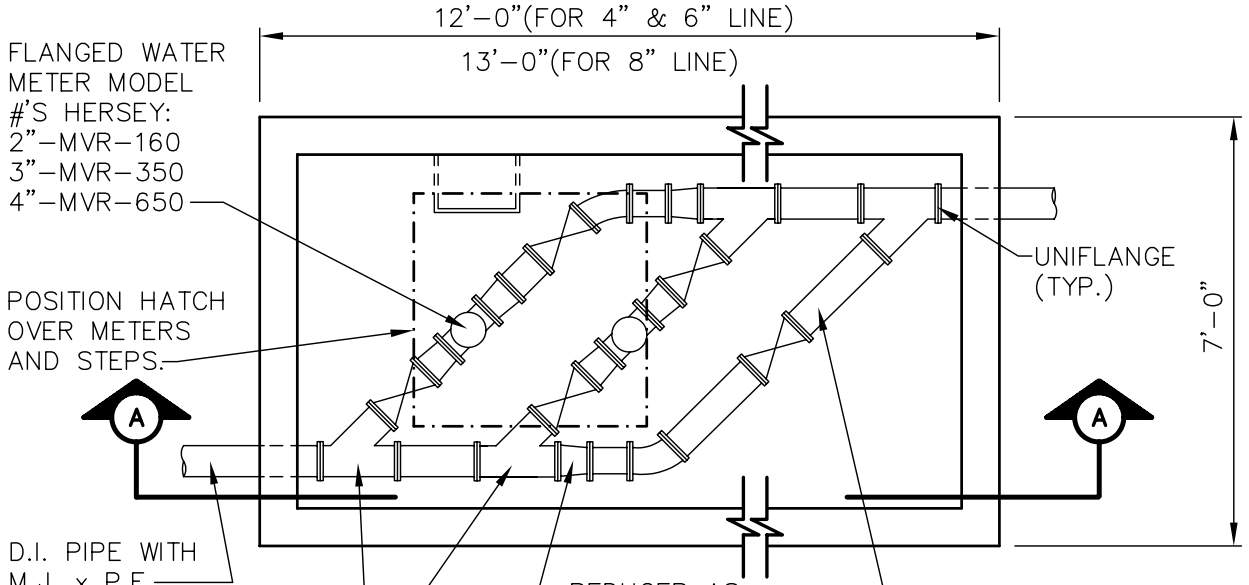
DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		CROSS DETAIL NO SCALE
		SECTION - 2 / DRAWING: D2-12



NOTES:

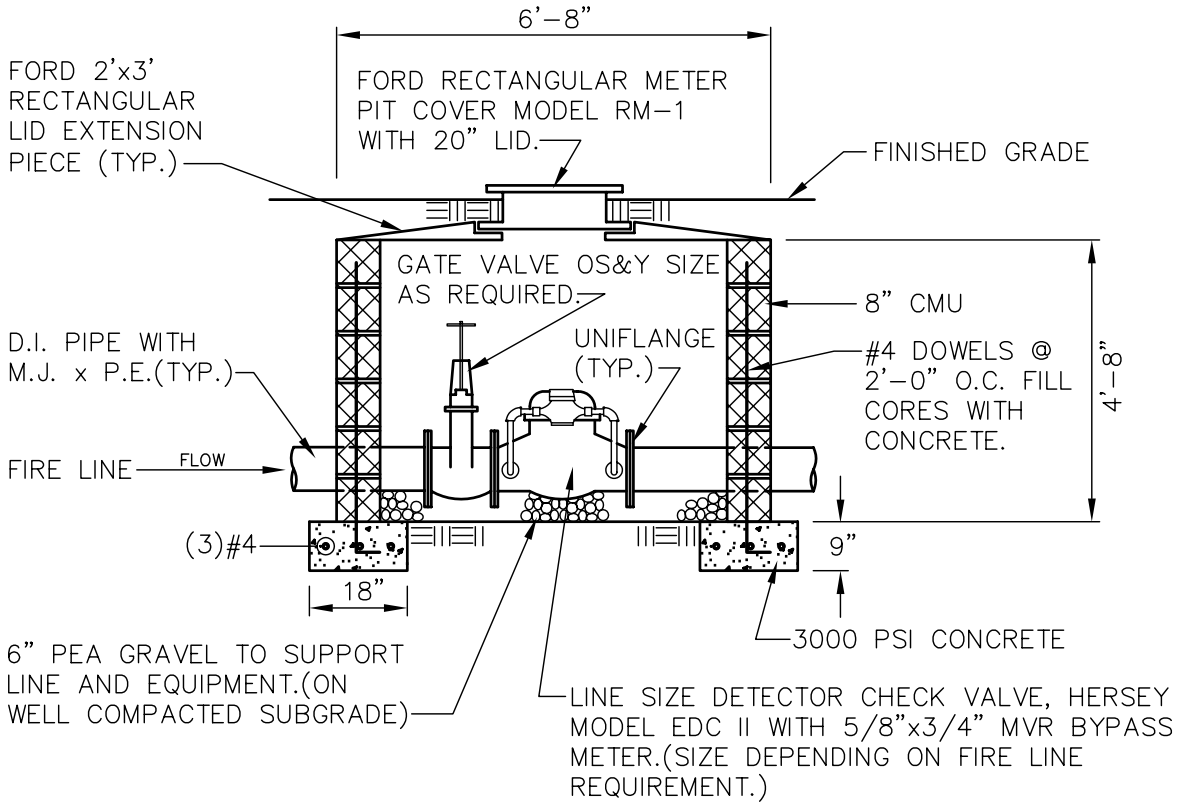
1. EQUIPMENT SUPPLIED AND INSTALLED BY DEVELOPER MAINTAINED BY CITY OF MILFORD.
2. NOT TO BE INSTALLED IN TRAFFIC AREAS.

SECTION "A"



PLAN

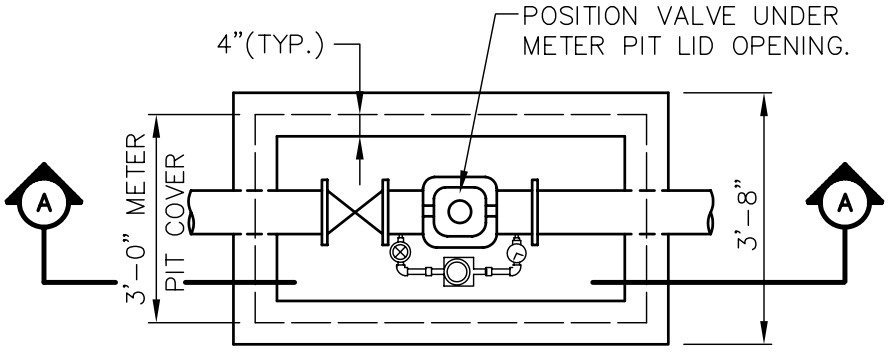
DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		INDUSTRIAL/COMMERCIAL METER DETAIL NO SCALE
		SECTION - 2 | DRAWING: D2-13



SECTION "A"

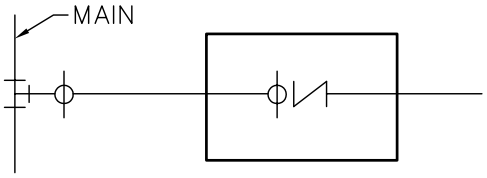
NOTES:

1. EQUIPMENT SUPPLIED AND INSTALLED BY DEVELOPER, MAINTAINED BY CITY OF MILFORD.
2. NOT TO BE INSTALLED IN TRAFFIC AREAS.

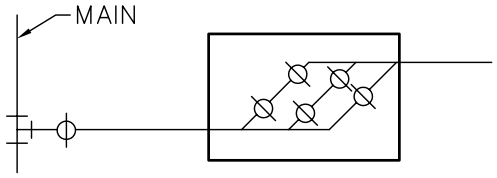


PLAN

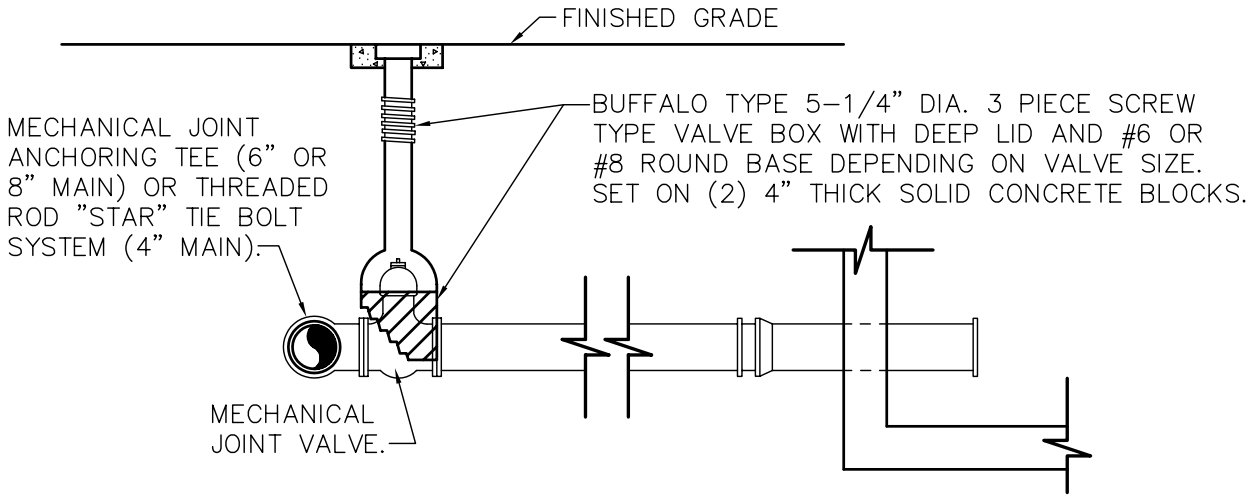
DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		FIRE LINE BACKFLOW PREVENTER DETAIL NO SCALE
		SECTION - 2 | DRAWING: D2-14



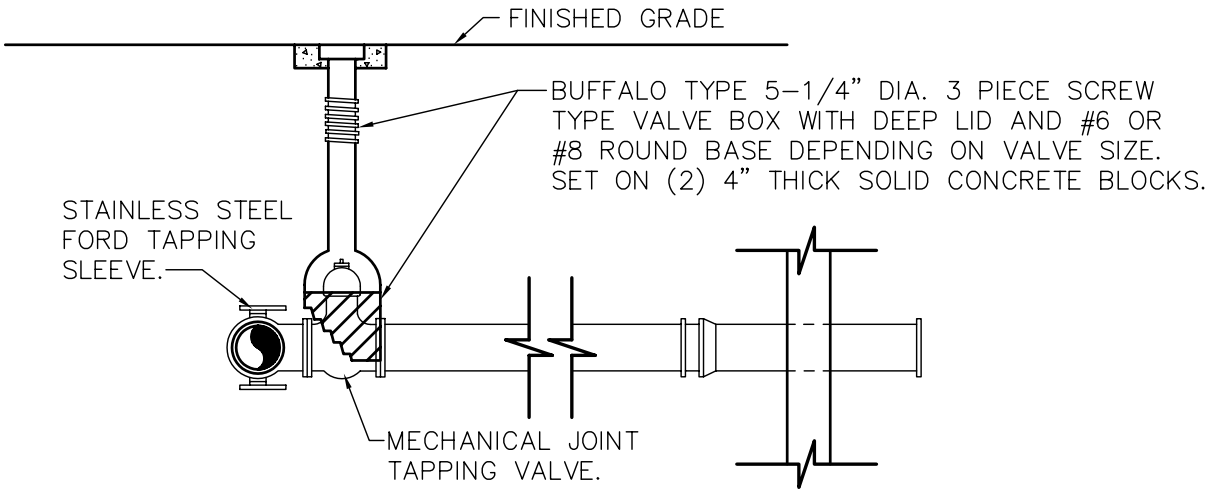
FIRE LINE BACK FLOW
PREVENTER HOOK–UP



INDUSTRIAL/COMMERCIAL
METER HOOK–UP



NEW MAIN INSTALLATION



EXISTING MAIN INSTALLATION

DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		INDUSTRIAL/COMMERCIAL INSTALLATION DETAIL NO SCALE
		SECTION – 2 | DRAWING: D2-15