3.01 GENERAL

A. The Contractor shall furnish all material and shall construct the pipe lines and all required appurtenances at the locations and to the lines, slopes and elevations shown on the drawings or designated by the Engineer.

B. All sewer pipe shall be polyvinyl chloride (PVC) pipe.

C. The Contractor shall submit certifications to the Engineer that all pipe, fittings and joints are as specified herein.

3.02 POLYVINYL CHLORIDE SEWER PIPE AND FITTINGS

A. Polyvinyl chloride (PVC) pipe, used for sewer construction, shall equal or exceed the requirements of ASTM-D-3034 and shall have a minimum standard dimension (SDR) ratio of 35 and the minimum pipe stiffness, as tested in accordance with ASTM-D-2412, shall be 45 when measured under 5% deflection at 73° Fahrenheit. Pipe shall be manufactured with integral wall bell and spigot joints in standard lengths not exceeding 20.0 feet.

B. All polyvinyl chloride (PVC) pipe and fittings shall utilize an elastomeric o-ring gasketed joint, assembled in accordance with the manufacturer's recommendations.

C. Polyvinyl chloride wye branches, pipe stoppers and other fittings shall be manufactured in accordance with the same specifications and shall have the same thickness, depth of socket, and annular space as the pipe. Tee fittings will not be permitted for use. Wye branches shall be complete pipe sections. Saddles will not be permitted for use.

D. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets. Stacking of pallets above five (5) feet in height will not 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 material to protect the pipe from ultraviolet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

E. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed.

3.03 POLYVINYL CHLORIDE FORCE MAIN PIPE AND FITTINGS

A. Pipe shall be manufactured to meet the requirements of ASTM-D-1785 Polyvinyl Chloride (PVC) pressure pipe Schedule 80. Pipe shall be manufactured in lengths not exceeding

twenty (20) feet. Pipe shall be integral bell by plain end design.

B. Pipe Joints
All pipes to be connected by solvent welding shall be installed by experienced pipe layers, to the satisfaction of the Engineer. Jointing shall be done in the manner recommended by the manufacturers. The PVC-compound shall meet ASTM-D-1784 requirements.

C. Pour concrete thrust blocks according to the details on all horizontal or vertical pipe bends.

D. The force mains shall be filled with water supplied by the Contractor, as directed by the Engineer, and the pressure raised to obtain a minimum test pressure of 75 psi, or two (2) times the operating pressure, whichever is greater, measured at the highest point of the section of pipeline under test. Particular care shall be taken to eliminate all air from the pipeline. The force mains shall be subject to a leakage test at the specified test pressure, measured at the highest point of the section of pipeline under test. This test shall be a minimum of four (4) hours duration during which time the leakage shall not exceed 25 gallons per inch of diameter per mile in 24-hours, and this is not to include any visible leaks. All visible leaks shall be repaired by the Contractor at no expense to the Owner. The Contractor shall make any and all repairs at his expense that may be necessary until the leakage test requirements have been met.

3.04 POLYETHYLENE (PE) PIPE AND FITTINGS (FOR DIRECTIONAL FORCE MAIN 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, PVC or PE pipe with a flanged expansion joint. The flanged expansion joint shall be a "FlexTend" flexible expansion joint as manufactured by EBAA, or approved equal.

3 .05 PIPE INSTALLATION

A. Pipe and fittings shall be carefully handled and lowered into the trench. Special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipe.

B. Before pipe is placed, the bottom of the trench shall be carefully shaped to fit the lower part of the pipe exterior with reasonable closeness for width of at least 60% of the pipe width. Bell holes shall be dug sufficiently large to insure the making of proper joints and so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom. No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Any defects due to settlement shall be made good by the Contractor.

C. Minimum Pipe Slopes:

Assuming an "n-value" of 0.010 for PVC, the table below provides the minimum allowed pipe slopes.

Sewer Size	Minimum Slope in Feet/100 Feet
8 inch	0.28
10 inch	0.22
12 inch	0.17
15 inch	0.12
18 inch	0.10
21 inch	0.08
24 inch	0.06

D. Proper and suitable tools and appliances, for the safe and convenient handling and laying of pipe, shall be used.

E. Whenever a pipe requires cutting to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end.

F. The pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open ends of all pipelines shall be provided with a stopper carefully fitted so as keep dirt and other substances from entering. This stopper

shall be kept in the end of the pipeline at all times when laying is not in actual progress.

G. All concrete required to support and reinforce wye branches, bends and other fittings shall be placed as directed, and the cost thereof shall be included and covered within the price bid.

H. Backfill materials shall be hand placed and mechanically tamped in six (6)-inch layers, placed uniformly on both sides of the pipe, to a point at least one (1) foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe.

I. Pipeline detectable tape shall be installed continuously along all sewer mains. The tape shall be installed directly above the pipe 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, imprinted with the words "CAUTION--SEWER LINE BELOW" and be capable of being detected with inductive methods.

J. The pipe used for stream crossing shall be ductile iron encased in concrete within the limits of the stream and to a point ten feet (10') from each bank. All pipe located within ten feet of a stream shall be ductile iron. Wherever possible, the line shall be located three feet (3') or more below the stream bed at stream crossing. (See Detail 3).

K. For refill of the remaining trench depth, refer to "Excavation and Backfill" Section of these specifications.

3.06 LAYING PIPE IN FREEZING WEATHER

No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation, unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

3.07 ARTIFICIAL FOUNDATION

Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel or of concrete; all to be of the form and dimensions and place according to the details or in the manner required by the Engineer.

3.08 TESTING

A. Gravity sewer to be tested in accordance with the following:

1) Contractor shall furnish all labor, tools, materials, and equipment, including water, pumps, compressors, stopwatch, gauges, and meters, subject to the approval of the Engineer for testing in accordance with these specifications.

2) The Engineer shall be notified in advance of all tests, and all tests shall be conducted to his entire satisfaction.

3) The Gravity sewer shall be mirror, mandrel, and air tested as follows:

a. MIRROR TEST:

Upon completion of pipe laying and backfilling to a point at least two (2) feet above the crown of the pipe, the Engineer will conduct a mirror test to check for defects, excess deflection, leakage, and for horizontal or vertical misalignment. Mirror testing shall consist of reflecting sunlight or artificial light via mirrors through the completed section of pipeline, which, in order to be accepted. shall be true and straight in horizontal and vertical alignment to allow for the full passage of the reflected light.

b. MANDREL TEST:

Sanitary sewer pipe shall be deflection tested not less than 30 days after the trench backfill and compaction has been completed. The test shall be conducted by pulling an approved solid pointed mandrel through the completed pipeline. The diameter of the mandrel shall be 95 percent of the inside diameter of the pipe. The mandrel shall be a rigid, non-adjustable mandrel having an effective length of not less than its nominal diameter.

Testing shall be conducted on a manhole to manhole basis and shall be done after the line has been completely cleaned and flushed. Any portion of the sewer which fails to pass the test shall be excavated, repaired or realigned and retested with both air and deflection tests.

c. LEAK TESTING USING AIR:

1) Sewers shall be tested in sections of not more than 400 foot lengths unless otherwise approved by the Engineer. Each section shall be tested immediately upon completion thereof. Each section shall meet the air pressure drop limitations specified herein.

2) All material and labor required for leakage tests shall be furnished by the Contractor.

3) Sewers shall be tested using the low-pressure air method in accordance with the requirements of ASTM C-828 and the Uni-Bell Plastic Pipe Association recommendations, based upon the Ramseier test time criteria. Procedural and equipment details shall be submitted to the Engineer prior to acceptance of its use for testing.

4) If the test time for the designated size and length elapses before the test pressure drops 0.5 psig, the section undergoing the test shall have passed.

5) If the pressure drops 0.5 psig before the appropriate test time has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test. Contractor shall determine, at his own expense, the source or sources of leakage and he shall repair or replace all defective materials and/or workmanship to the satisfaction of the Engineer. The completed pipe installation shall then be retested and required to meet the requirements of this test.

3.09 BORING AND JACKING OF SANITARY SEWER

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 provision 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 (l)-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 wall thickness for sleeves shall be standard thickness. 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 as required by the plans.

K. Use runners or cradles to support the pipe in the casing. A minimum of three (3) supports is needed per joint of pipe providing a maximum span of 6 1/4-feet for PVC pipe lengths of 12.5 feet or less. The maximum span between supports for pipe lengths of 19 to 20 feet must not exceed 7.5 feet.

3.10 DIRECTIONAL BORE (FORCE MAIN ONLY)

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.

3.11 SEWER MANHOLES

A. GENERAL

1) The Contractor shall have the option of constructing shallow (4' or less) manholes of precast reinforced concrete or "SS" sewer brick as indicated on the drawings. Manholes deeper than four (4) feet will be precast reinforced concrete.

2) Manholes shall be built at such points on the pipelines, and of such form and dimensions as are shown on the drawings or as may be directed. Manholes shall be built as pipe laying progresses, and the Engineer may stop work entirely on the pipe laying, if manhole construction is delayed to such an extent as to be hazardous to construction or the public.

3) Manholes shall be spaced no more than 400 feet apart and at all bends in gravity sewer mains.

B. PRECAST REINFORCED CONCRETE MANHOLES

1) Precast reinforced concrete risers, eccentric cones and bases shall be in conformance with ASTM Designation C 478. Joints between riser sections shall be fitted with an "O" ring rubber gasket, meeting the requirements of ASTM Designation C 443. Installation of risers shall be in accordance with manufacturer's recommendations under the supervision of the Engineer.

2) Precast reinforced concrete base and riser sections shall be as manufactured by Atlantic Concrete Products Company, Virginia Precast Corporation, or equal.

3) Interior and exterior joint spaces of all manhole risers shall be filled prior to application of the exterior waterproofing. The interior joint shall be mortared. The

exterior joint may be mortared or filled with a joint filler compound. Said compound shall be Pioneer 301 as manufactured by Daubert Chemical Company, Oakbrook, Illinois, or equal.

4) Lifting holes in the walls of precast reinforced concrete risers will be allowed but shall be plugged with rubber stoppers and grouted flush with face or manhole wall after installation of manhole riser sections. Not more than two (2) holes shall be cast in the walls of each riser section for the purpose of handling.

5) The exterior surface of all precast manholes shall receive a minimum two (2) coat application of a 68% solids coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surface shall be prepared in accordance with the manufacturer's instructions and coatings applied in the field in a manner acceptable to the Engineer. The coating material shall be Bitumastic Super Service Black manufactured by Koppers Company, Inc., Pittsburgh, Pennsylvania, Tar Jet Super Black XX-32-B-22 manufactured by Pennsbury Coatings Corp., New Britain, Pennsylvania, or equal.

6) All pipe-to-manhole connections in the precast manhole shall be made by means of an integrally cast flexible connector which shall be Lockjoint flexible manhole sleeve as manufactured by Interpace Corp., Parsippany, New Jersey, or A-Lok flexible manhole gasket as manufactured by A-Lok Corp., Trenton, New Jersey, or equal.

C. FLOW CHANNELS

1) Manhole flowchannels and benches shall be constructed of "SS" sewer brick with care taken to secure smooth and even surfaces with full special mortar joints. Channel sections shall be built up to true line and radius, and curved sections shall provide a uniform transition in the flow direction.

2) Materials and construction of flow channels shall be in accordance with appropriate sections for materials so used, as hereinafter specified.

3) Precast concrete flow channels shall not be allowed.

D. CONCRETE

All concrete for manhole base slabs and cradles, encasements, blocking, etc. shall have a

minimum compressive strength of 3,000 psi at twenty-eight (28) days.

E. BRICK

All brick shall conform to the "Standard Specifications for Sewer Brick," ASTM Designation C 32, Grade SS, except that the maximum absorption for the average of five (5) bricks shall not exceed 10%; and the individual brick maximum shall not exceed 14%.

F. MORTAR

1) Cement shall be in accordance with "Standard Specifications for Portland Cement", ASTM Designation C 150 for Type II.

2) Sand shall be composed of sharp, angular, silicious grains, coarse, or graded from fine to coarse, with the coarsest grains predominating, and sensibly free from clay, loam, dirt, mica, organic matter, or other impurities. Sand containing more than 5% by weight of foreign material shall not be used. This limit may be changed for special classes of work, if hereinafter specified. Sand exhibiting more than an acceptable amount of fine matter or impurities may be required to be washed after delivery on the work or shall be rejected altogether. Sand for mortar shall be screened to reject all particles of a greater diameter than 1/4-inch and shall not contain more than 5% by weight of a very fine material.

3) Unless hereinafter specified otherwise, all mortar shall be composed of cement and sand of the character above specified. The proportion of volume shall be one (1) part of cement to two (2) of sand. One volume of cement shall be 94 pounds net. One volume of sand shall be 0.9 cubic feet, the sand not being packed more closely than by throwing it into a box in the usual way. Mortar shall be fresh mixed in small batches for the work in hand. Tight boxes or platforms made for the purposes shall be used. The sand and cement shall be thoroughly mixed dry, in the proper proportions, until uniform color has been produced, whereupon a moderate dose of water shall be added, so as to produce a stiff paste of the proper consistency.

4) Sand obtained from the excavation shall not be used.

G. LAYING BRICK

1) All brickwork shall be laid by competent professionals.

2) All brick shall be laid in a full bed of mortar with all vertical and horizontal joints filled solid with mortar.

3) Joints shall not be less than 3/8-inch or more than 1/2-inch wide except as otherwise specified.

4) No brickwork shall be laid when the temperature is below 40° or when the indications are for lower temperatures within twenty-four (24) hours. The Contractor shall take such measures as may be approved to prevent brickwork from being exposed to freezing temperatures for a period of not less than five (5) days after laying.

5) Special care shall be taken in laying brick in inverts of manholes to insure a uniform flow of water through the sections. In such locations, joints shall not exceed 1/16-inch in thickness and each brick shall be laid in full mortar bed with joints on bottom side and end made in one operation. No grouting or working in of mortar after laying the brick, will be permitted.

H. MANHOLE STEPS

1) Manhole steps shall be made of 3/8-inch diameter (No.3) steel reinforcing bars, ASTM Designation A 615, Grade 60, encased in polypropylene plastic. Manhole steps shall have notched tread ridge with retainer lug on each side.

2) Manhole steps shall be cast in place during manufacture of precast reinforced concrete manholes or placed in brick manholes during construction. Embedment length shall be suitable for minimum five (5)-inch thick, precast reinforced concrete riser walls.

3) Manhole steps shall be OSHA approved and as manufactured by; M.A. Industries, Inc., Peachtree City, Georgia; ICM, Inc., Jacksonville, Arkansas, or equal.

4) Manhole steps shall be spaced twelve (12)-inches apart. The maximum spacing from top of manhole to the first step shall not exceed sixteen (16)-inches.

I. MANHOLE FRAMES AND COVERS

1) Frames and covers for manholes shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.

2) Frames and covers shall be Neenah Model R-1642 heavy duty, solid lid, with one (1) pick hole. Material for frames and covers shall be in accordance with standard specifications for gray iron castings ASTM A-48 for Class 35.

3) The maximum allowable vertical adjustment of manhole cover frames shall be 12 inches. Adjustments shall be made with brick and mortar or precast adjustment rings.

4) Manhole stubs shall be extended four (4) feet outside of the manhole wall, unless otherwise detailed. The stub end shall be plugged.

J. TESTS

If inspection reveals any visible leakage or seepage in any manhole, the Contractor will be required to accomplish such remedial measures as may be directed by the Engineer. Caulking or patching of interior manhole surfaces will not be acceptance.

3.12 SEWER HOUSE CONNECTIONS

A. GENERAL

1) In all house connections, each property shall be separately and independently connected with the sanitary sewer, and for the purpose of this regulation, each side of a so-called double house shall be considered as a separate property and each side must have a separate house connection located entirely within its boundaries.

2) The City must be given ample notice (48 hours) in order to examine the work before ordering the backfilling to begin.

3) Any part of the work which may have to be covered without previously obtaining the consent of the City, shall be uncovered for examination if so ordered by City.

4) The backfilling around a house connection shall be so executed as not to injure the joints of the pipes.

5) All sewer laterals for house connections shall connect directly to the gravity main using a Y-branch connection. No laterals shall be allowed to connect to a manhole.

B. HOUSE CONNECTION CONSTRUCTION

1) Cleanouts

a. At least one cleanout must be provided on every house connection.

b. Location(s) of cleanout(s) shall be governed by the following consideration:

- Maximum pipe run between cleanout(s) shall be seventy-five feet (75').
- A cleanout brought to grade shall be placed immediately upstream from deviation from straight horizontal alignment of more than 22 ½ degrees (1/16 bend).
- Only one 22 ½ degree bend will be permitted per one hundred feet (100') without a cleanout.

c. A sanitary lateral cleanout shall be placed on the lateral within five feet (5') of the building to be serviced.

d. A cleanout brought to grade shall be placed immediately upstream from each deviation from straight grade.

e. The cleanout cover shall be installed to match finished grade and shall be supported with compacted earth or a cement base as needed to maintain cover at finished grade.

f. Cleanouts shall be connected to the house line with "wye" fittings with the cleanout leg pointing upstream.

g. All cleanouts shall be plugged to prevent infiltration of ground or surface water.

C. PIPE SIZE

1) No gravity type house connection shall be less than six inches (6") internal diameter from main to property line, four inches (4") to house.

2) Each house connection shall be laid on an even grade and straight line, where

feasible.

3) The grade of a house connection wherever possible shall not be less than two percent (2%) nor greater than ten percent (10%); but in every case shall be subject to the judgement of the City.

D. GREASE TRAP

1) A properly designed ventilated grease trap shall be interposed between the house connection and the kitchen and pantry sinks of every hotel, eating house, restaurant, cooking establishment or gasoline service station.

2) No trade wastes, such as those from factories, laundries, dairies, etc., shall be discharged into the sanitary sewer except by special permission from the City of Milford.

3) Grease trap design and installation shall be as per current Kent County, Delaware Standards.

E. INSPECTION

1) Sewer inspection is available from 8:00 A.M. to 4:00 P.M., Monday through Friday except for holidays.

2) Requests for sewer inspection shall be made at least 48 hours in advance by calling 422-1110.

F. PIPE CLASSIFICATION AND PIPE REQUIREMENTS

The pipe used for either house connections or sewer extensions must meet the requirements of most recent ASTM specifications and good engineering practice.

G. HOUSE CONNECTIONS

Polyvinyl Chloride - PVC Schedule 40 with cemented coupling joints, rubber compression joints or SDR-35 pipe shall be used for sewer house connections.

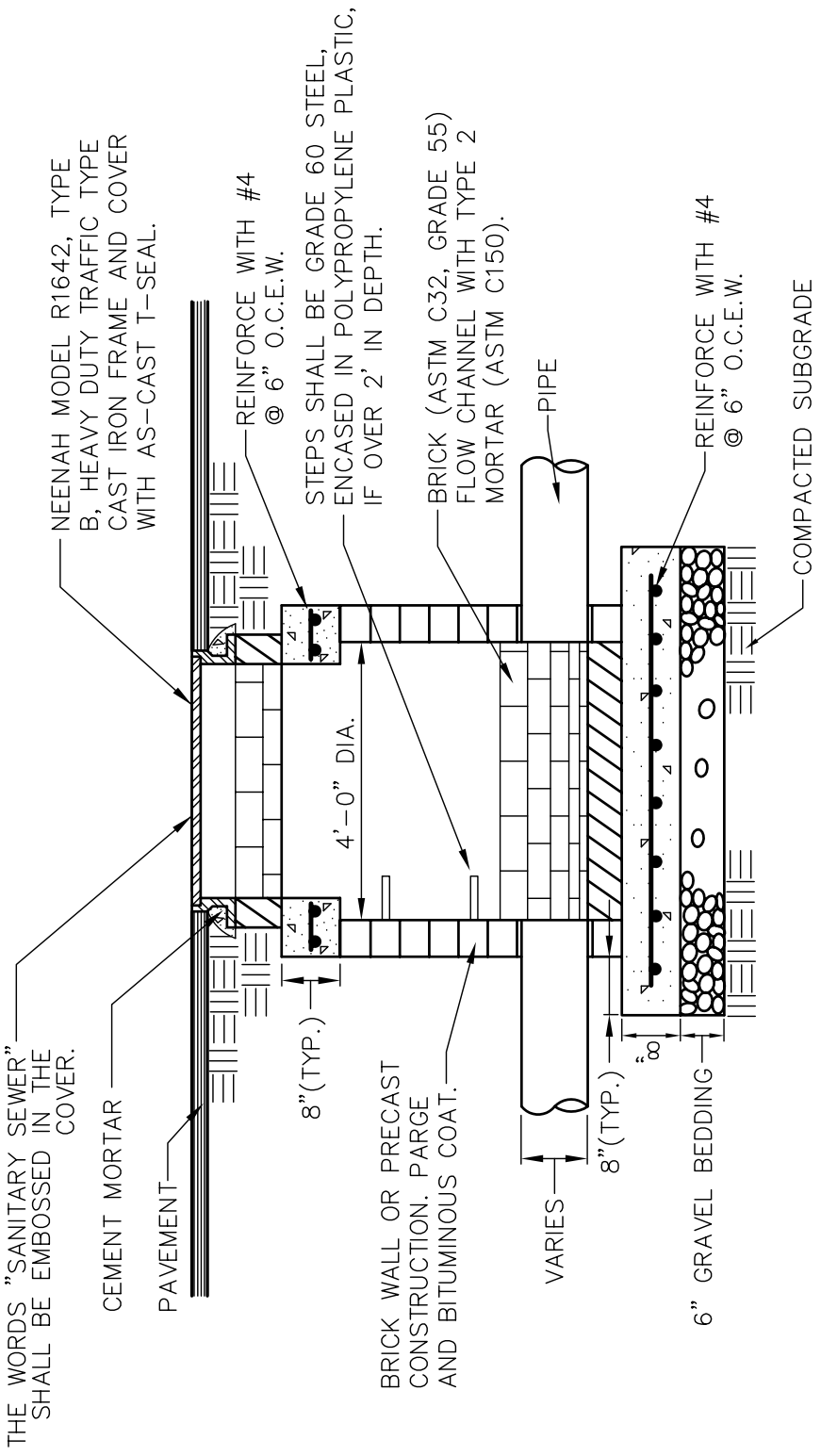
H. STREAM CROSSING

The pipe used for stream crossing shall be ductile iron encased in concrete within the limits of the stream and to a point ten feet (10') from each bank. All pipe located within ten feet of a stream shall be ductile iron. Wherever possible, the line shall be located three feet (3') below the stream bed at stream crossing.

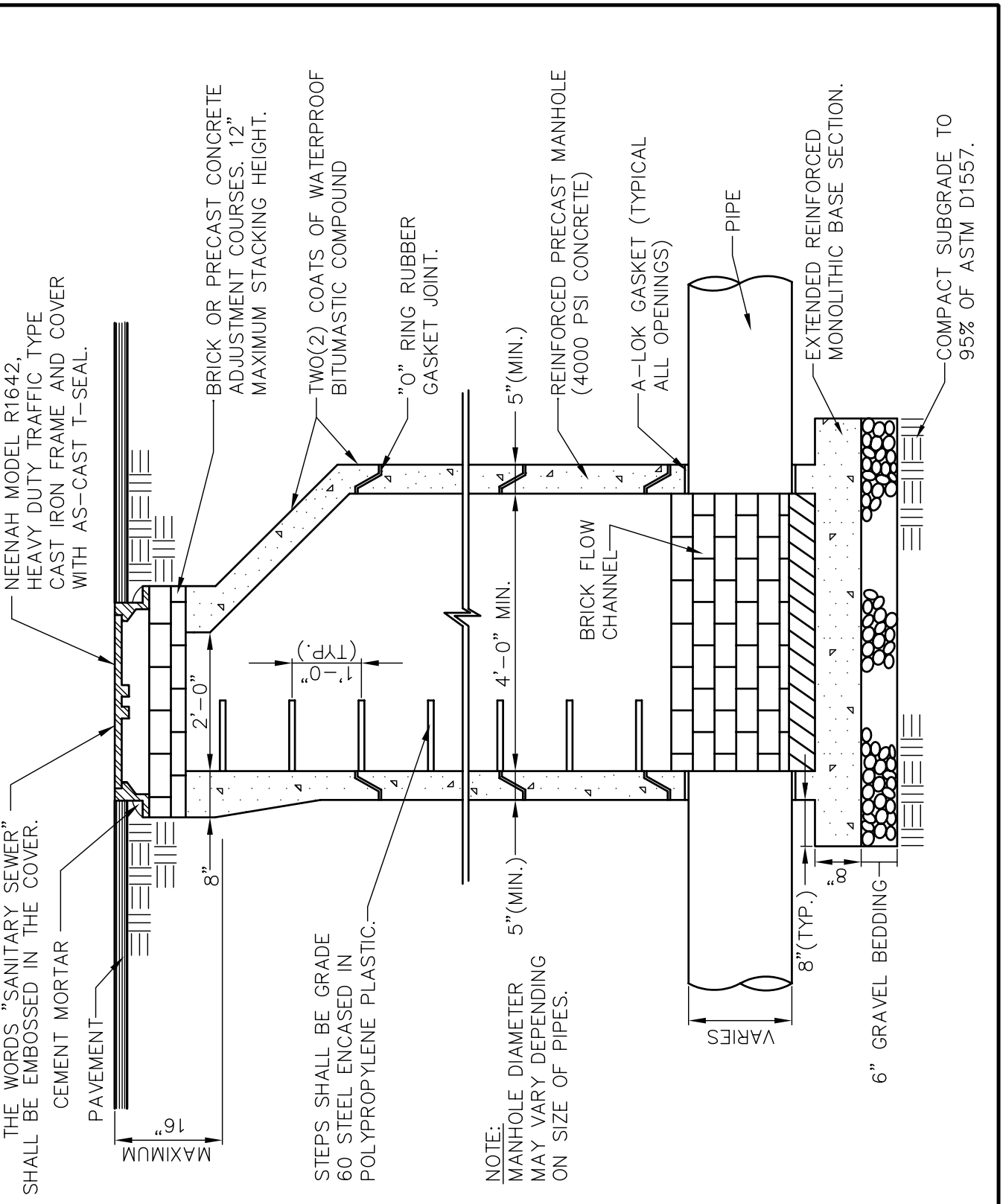
I. RESIDENTIAL SEWER CONNECTIONS

Taps and sewer laterals shall be situated to maintain a minimum of ten feet (10') of separation from any water service or water supply.

END OF SECTION



DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		SHALLOW MANHOLE DETAIL NO SCALE
		SECTION - 3 | DRAWING: D3-1



DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		PRECAST CONCRETE MANHOLE DETAIL NO SCALE
		SECTION - 3 | DRAWING: D3-2

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

DATE:

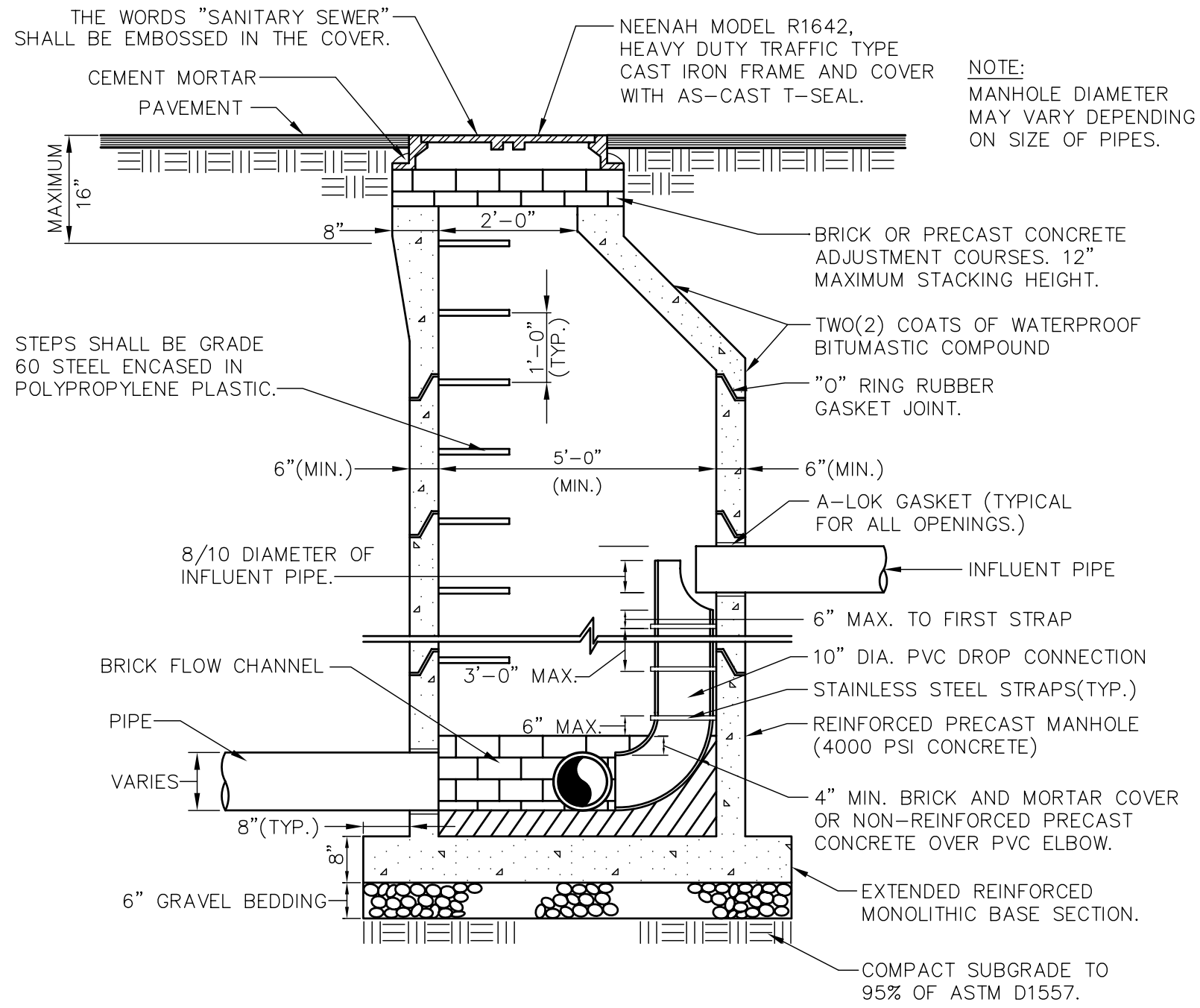
REVISION NO.:

APPROVED:

INSIDE DROP MANHOLE DETAIL
NO SCALE

SECTION - 3

DRAWING: D3-3



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

DATE:

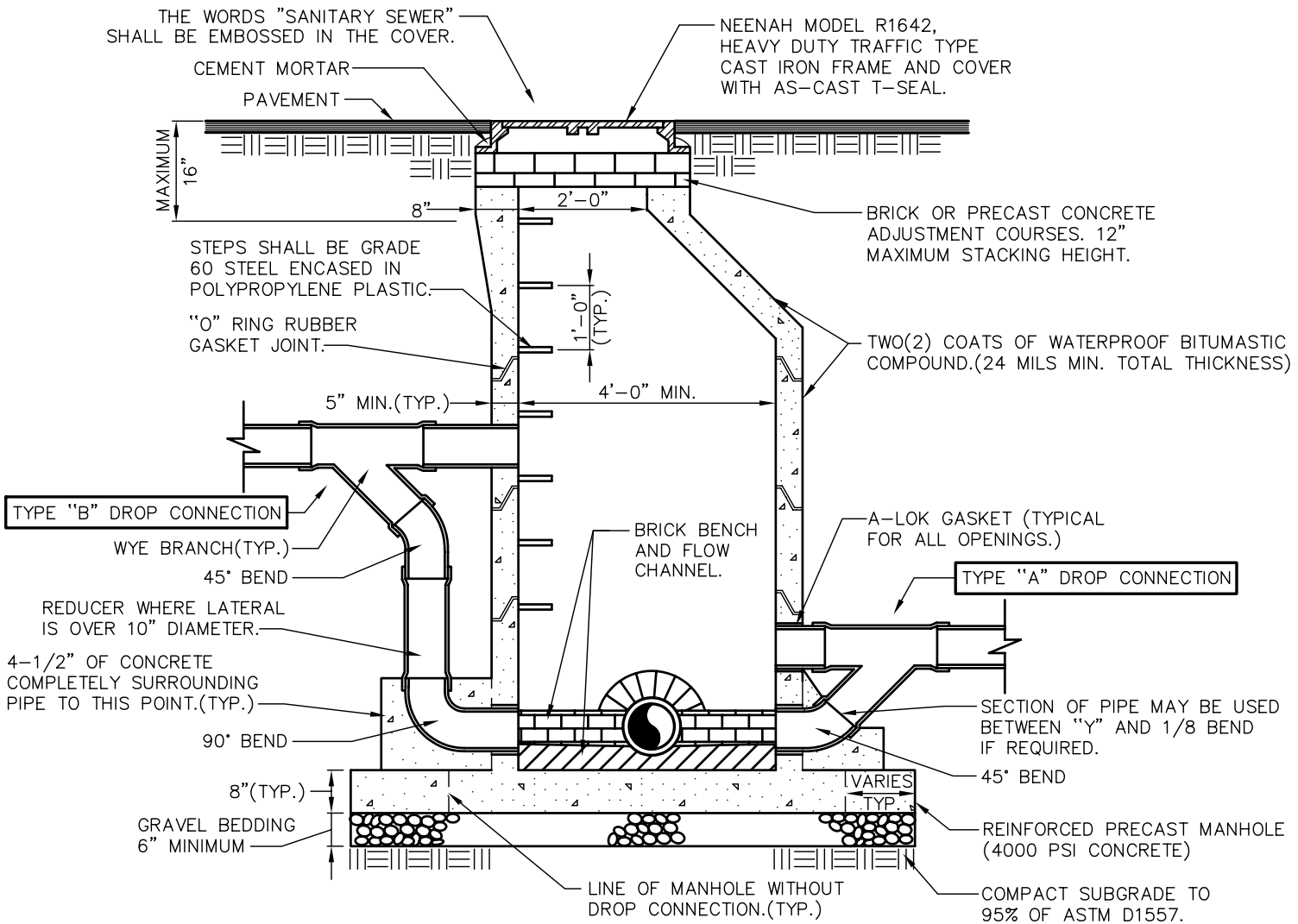
REVISION NO.:

APPROVED:

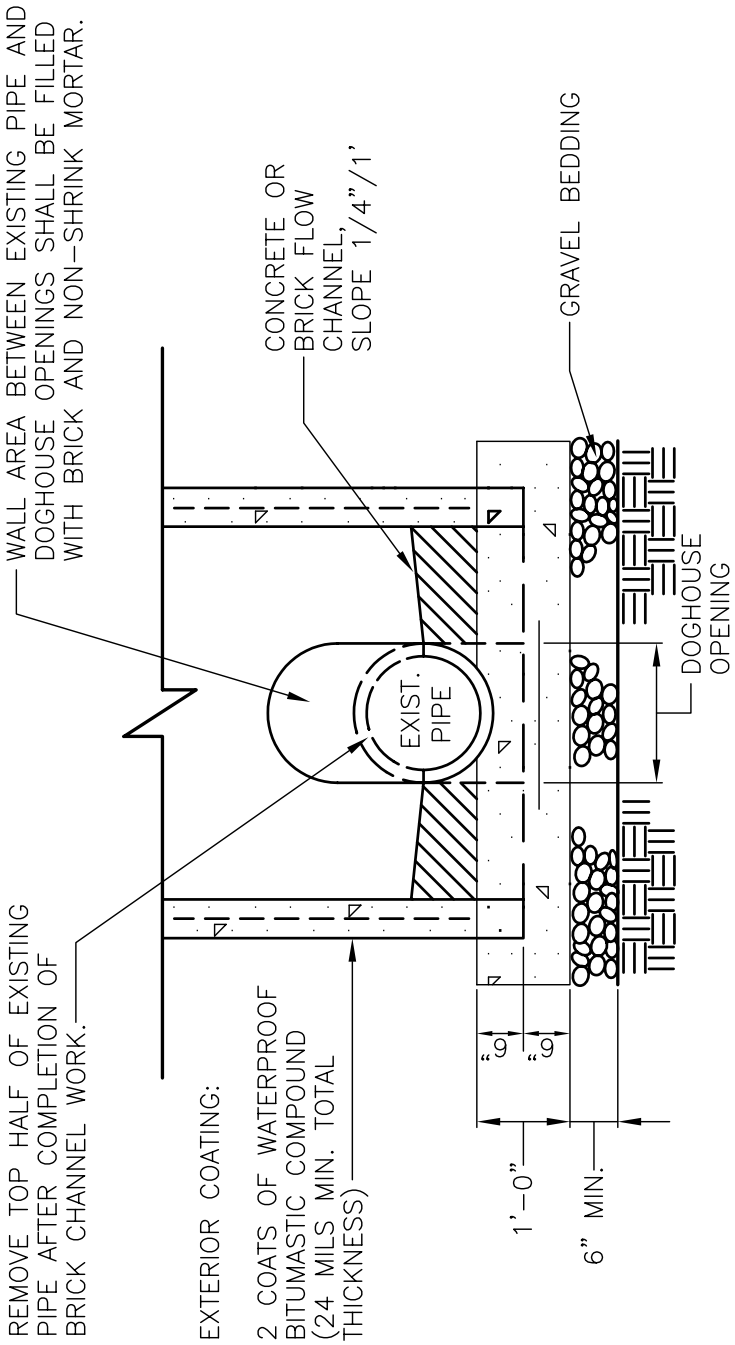
OUTSIDE DROP MANHOLE DETAIL
NO SCALE

SECTION - 3

DRAWING: D3-4



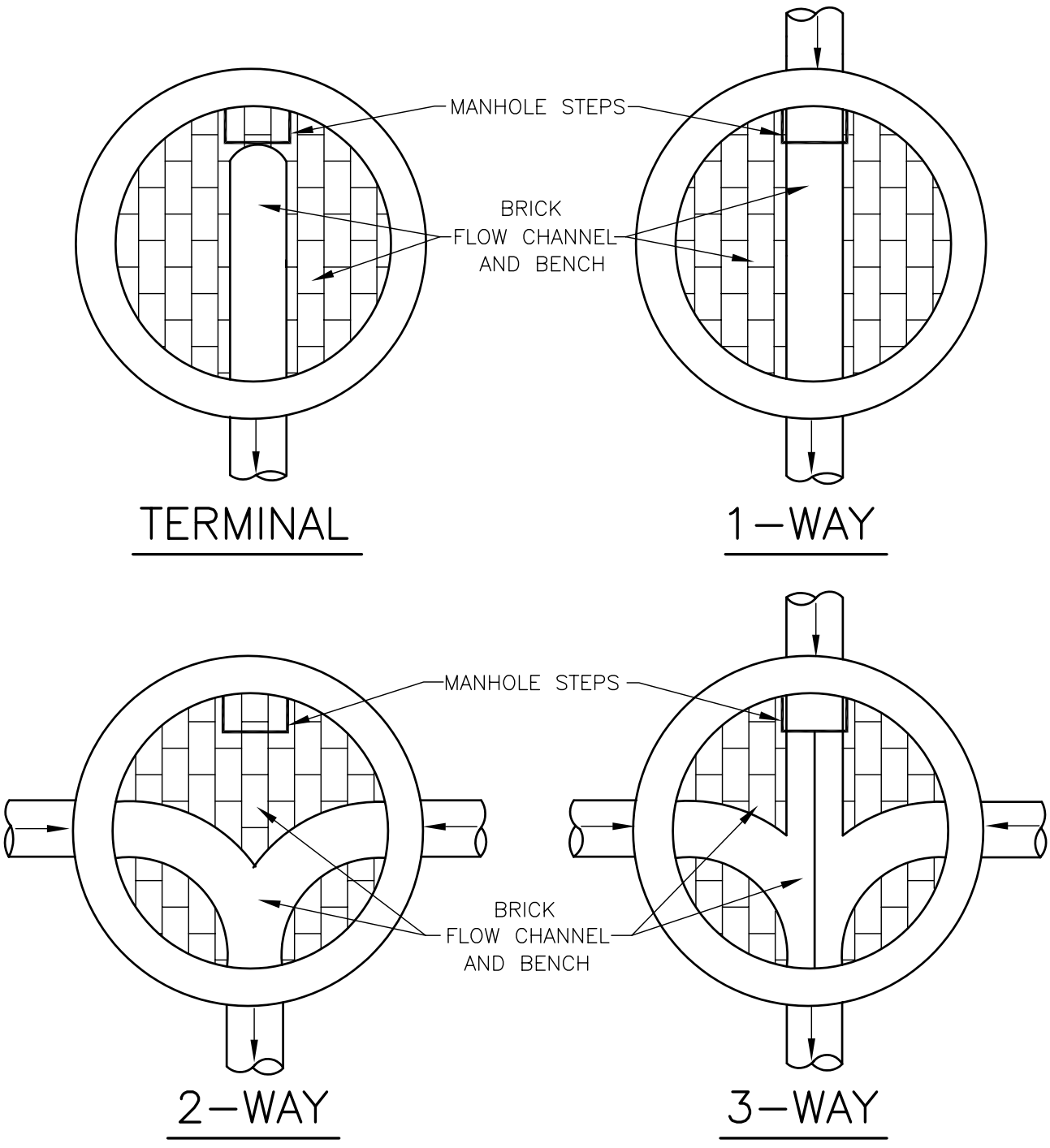
DROP CONNECTIONS			
SIZE OF SEWER	TYPE "A"		TYPE "B"
	MAX.DROP	MIN.DROP	MIN.DROP
6" OR 8"	3'-9"	1'-9"	3'-9"
10"	4'-0"	2'-0"	4'-0"
12"	6'-0"	2'-6"	6'-0"



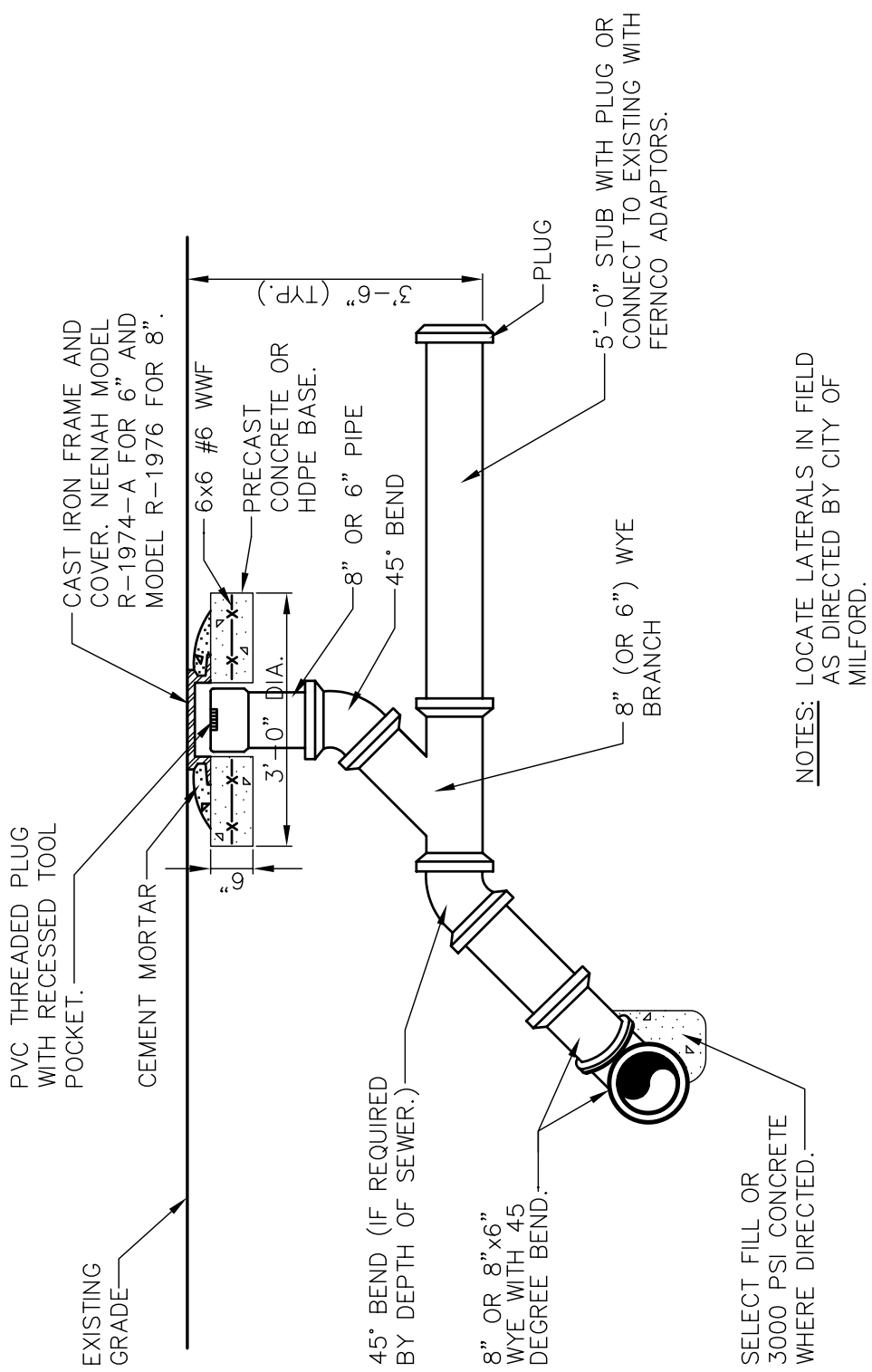
NOTES:

1. CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000 P.S.I.
2. MANHOLE SHALL CONFORM TO ASTM-C478, LATEST REVISION.
3. ALL PORTIONS OF MANHOLE SHALL BE CONSTRUCTED AS DETAILED FOR PRECAST CONCRETE MANHOLE.

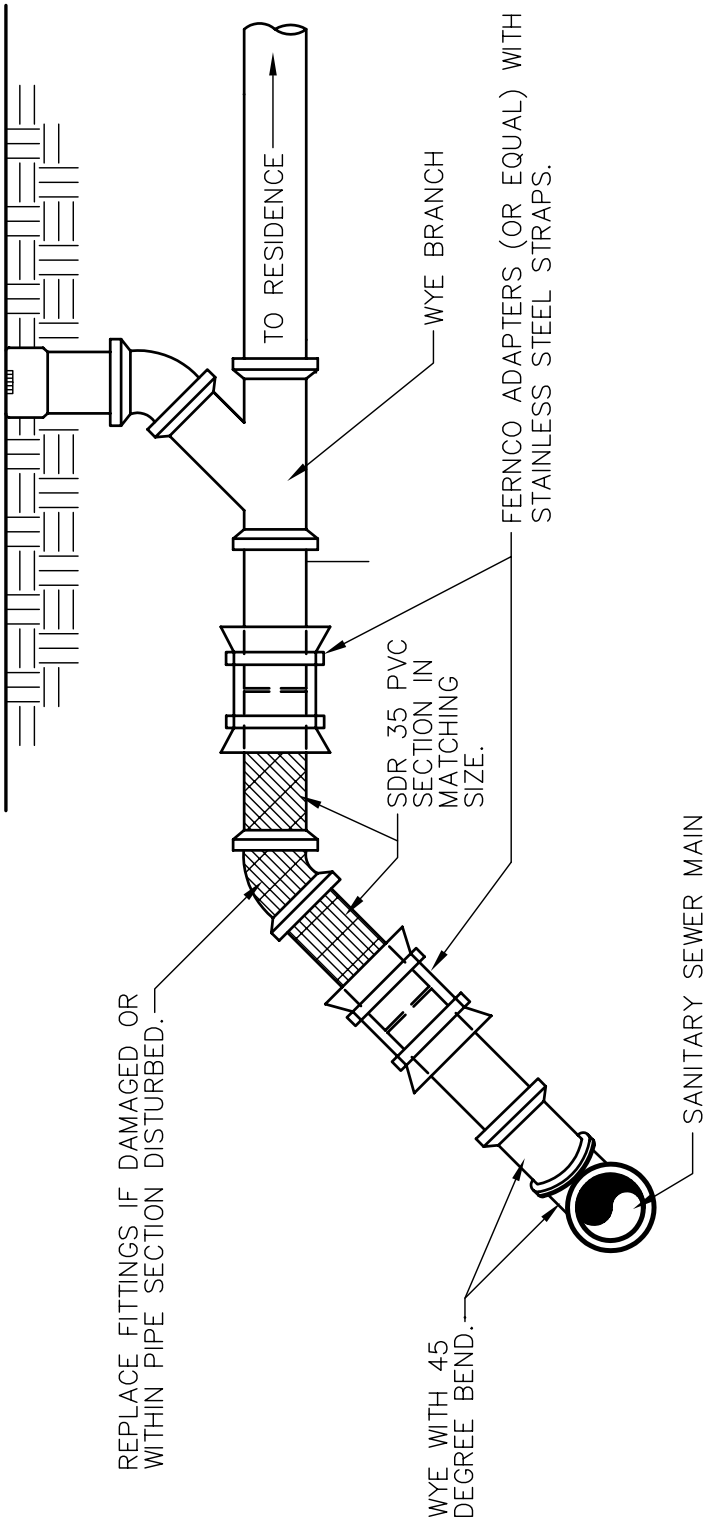
DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		DOGHOUSE MANHOLE DETAIL NO SCALE
		SECTION - 3 / DRAWING: D3-5



DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		TYPICAL MANHOLE FLOW CHANNEL DETAIL NO SCALE
		SECTION - 3 / DRAWING: D3-6



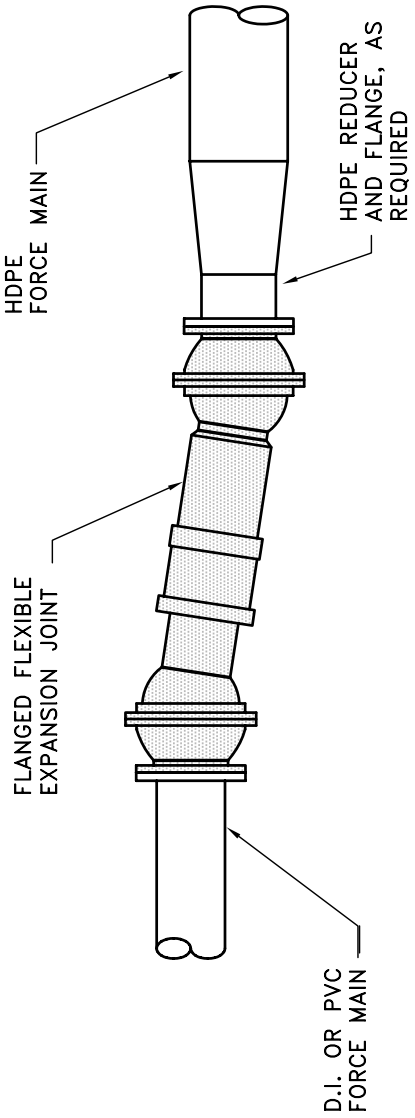
DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		BUILDING LATERAL CLEANOUT DETAIL NO SCALE
		SECTION - 3 / DRAWING: D3-7



NOTES:
1. LOCATE LATERALS IN FIELD AS DIRECTED BY CITY OF MILFORD.
2. CAST IRON FRAME AND COVER, AND CONCRETE OR HDPE BASE NOT SHOWN, BUT REQUIRED. SEE DETAIL D3-7.

DATE:	REVISION NO.:	APPROVED:
CITY OF MILFORD DEPARTMENT OF PUBLIC WORKS WATER & WASTEWATER DIVISION CONSTRUCTION STANDARDS		SEWER LATERAL RESTORATION DETAIL NO SCALE
		SECTION - 3 / DRAWING: D3-8

DIRECTIONAL BORE
TERMINAL END EXPANSION JOINT



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

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 - 3	DRAWING: D3-9