
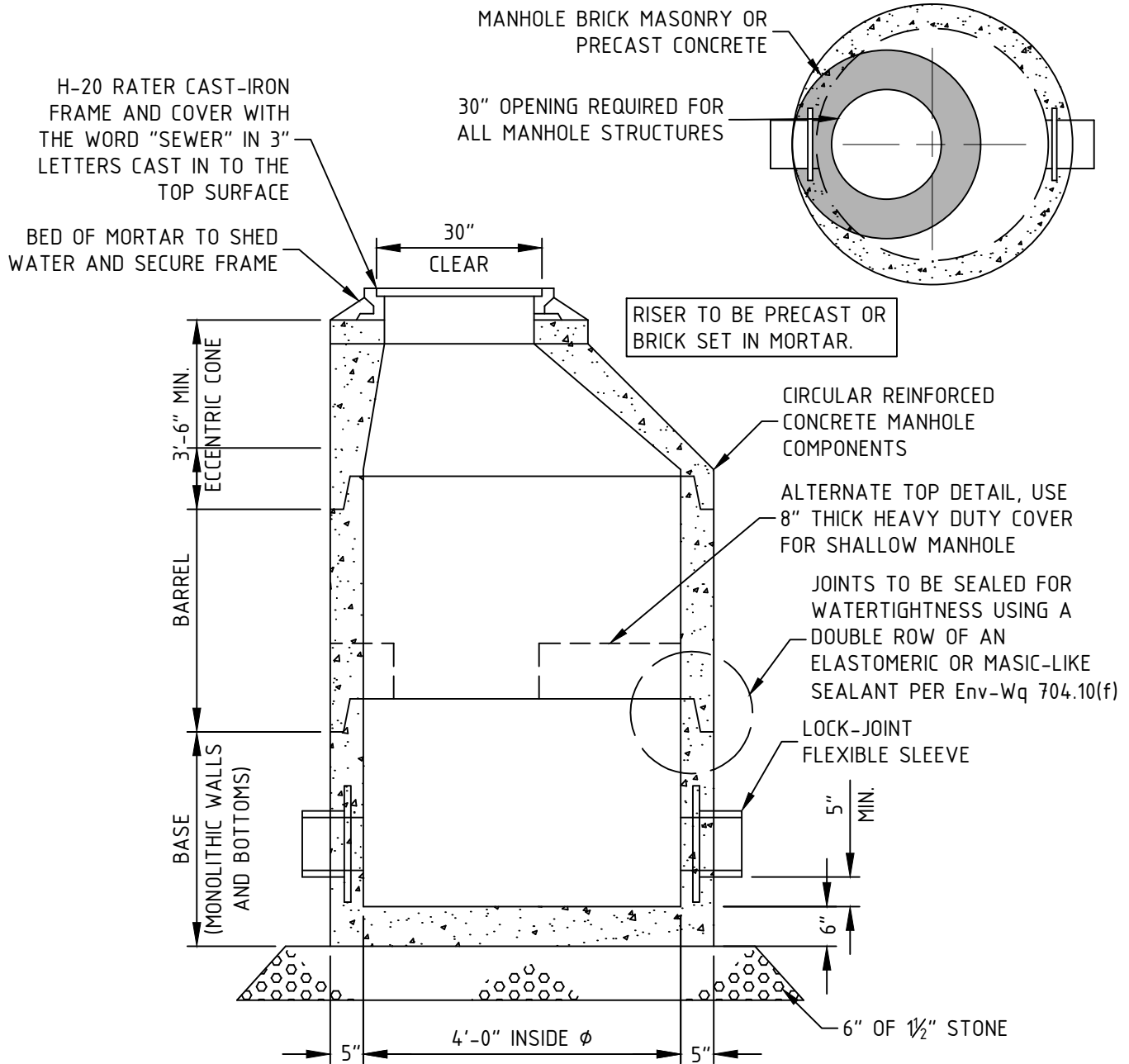


CHECKED BY: AT		Town of Durham Engineering Division	SECTION: SEWER
APPROVED BY: RR		<h1>SANITARY SEWER MAIN/SERVICE TRENCH</h1>	DWG #: SM-1
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NOTES:

1. CONCRETE 4,000 PSI AFTER 28 DAYS
2. H-20 LOADING REQUIRED
3. 5" THICK REINFORCED CONCRETE WALLS PER Env-Wq 704.10(d)
4. ON THE INSIDE OF STRUCTURE, PRE-CAST JOINTS AND LADDER RUNG HOLES TO BE SEALED WITH PORTLAND CEMENT
5. LIST HOLES ARE TO BE SEALED WITH MORTAR FLUSH TO THE OUTSIDE STRUCTURE WALL PRIOR TO BACKFILLING
6. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES. NO MORE THAN 75% OF HORIZONTAL CROSS-SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS
7. MANHOLES AND TRAFFIC SIGNAL LOOPS SHALL BE SEPARATED BY A MINIMUM OF 2' TO ALL FOR MAINTENANCE OF STRUCTURE

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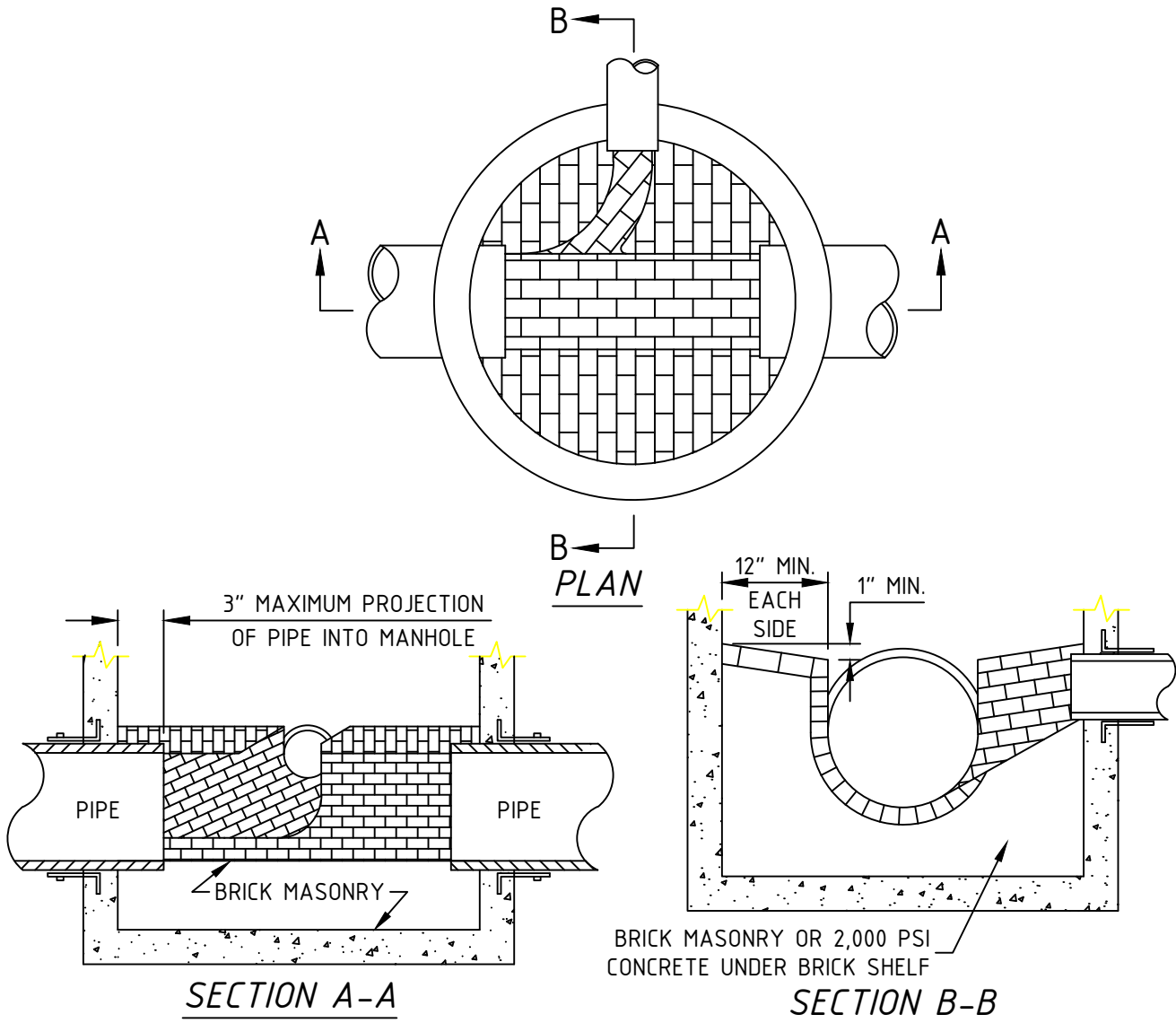
SEWER MANHOLE

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NOTES:

1. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
2. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
3. ALTERNATE INVERT DETAILS: REPLACE BRICK INVERT WITH CAST-IN-PLACE CONCRETE.
4. FOR MAINS 8" TO 15", CONSTRUCT INVERT THROUGH THE LOWER HALF OF THE PIPE (MINIMUM) OR AS APPROVED.
 - 8" PIPE - 7 BRICK MINIMUM (JUST ABOVE MIDPOINT)
 - 10" PIPE - 7 BRICK MINIMUM
 - 12" PIPE - 9 BRICK MINIMUM
 - 15" PIPE - 11 BRICK MINIMUM
5. FOR MAINS GREATER THAN 15", CONSTRUCT BRICK INVERT TO TOP OF PIPE.
6. MAINTAIN TROUGH WIDTH THROUGH STRUCTURE.
7. TYPICAL BRICK, ASTM DESIGNATION: C321-93.
8. SERVICE CONNECTIONS SHOULD BE PER THE "SEWER SERVICE CONNECTION/INSIDE DROP MANHOLE" DETAIL. WHERE GRADES PROHIBIT SUCH A CONNECTION THE CONNECTION SHOULD BE AS SHOWN WITH THE SERVICE INVERT 2" ABOVE THE INVERT OF THE MAIN WHERE IT ENTERS THE MANHOLE.

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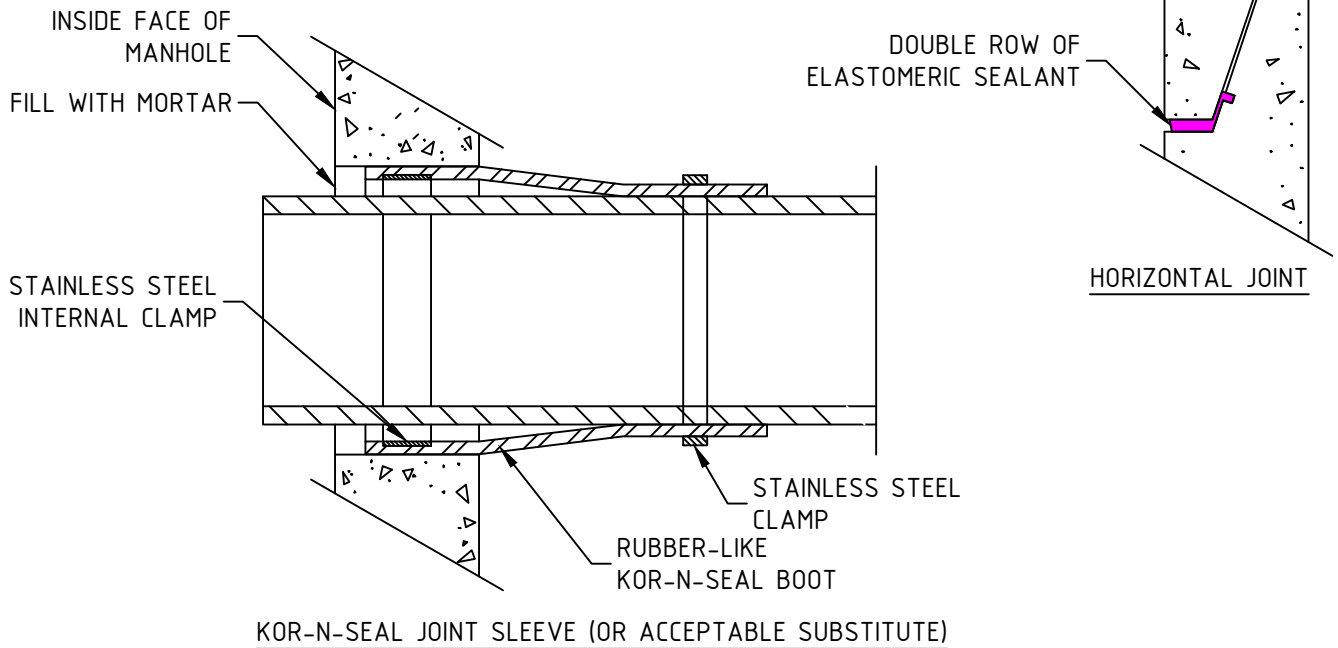
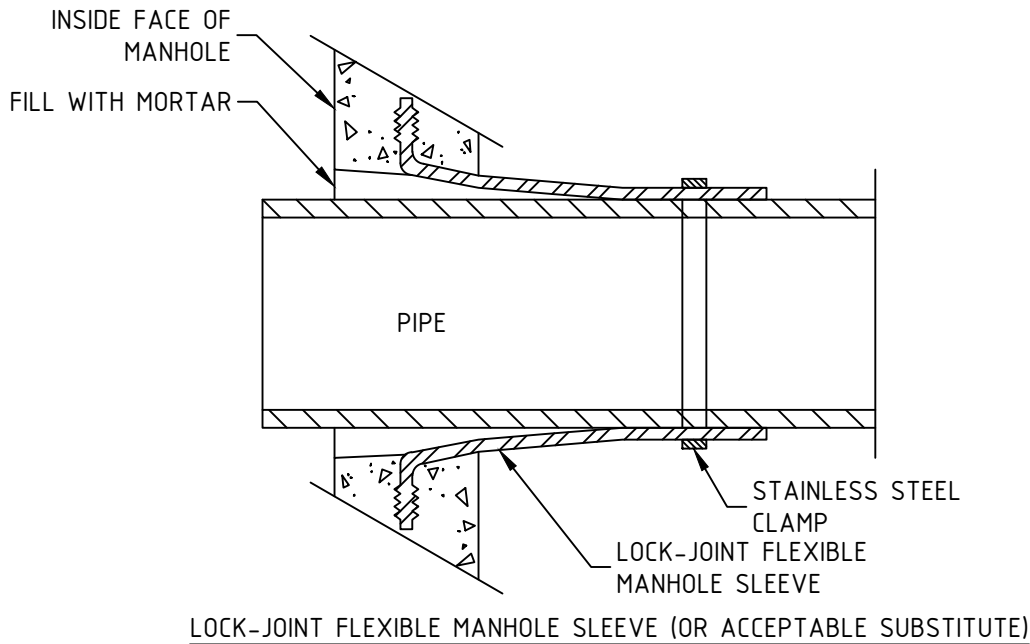
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**SANITARY BRICK SHELF
CONSTRUCTION**

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NOTES:

1. USE LOCK-JOINT FLEXIBLE MANHOLE SLEEVE FOR FACTORY INSTALLED APPLICATIONS AND KOR-N-SEAL SLEEVE FOR IN-FIELD INSTALLATIONS.
2. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS

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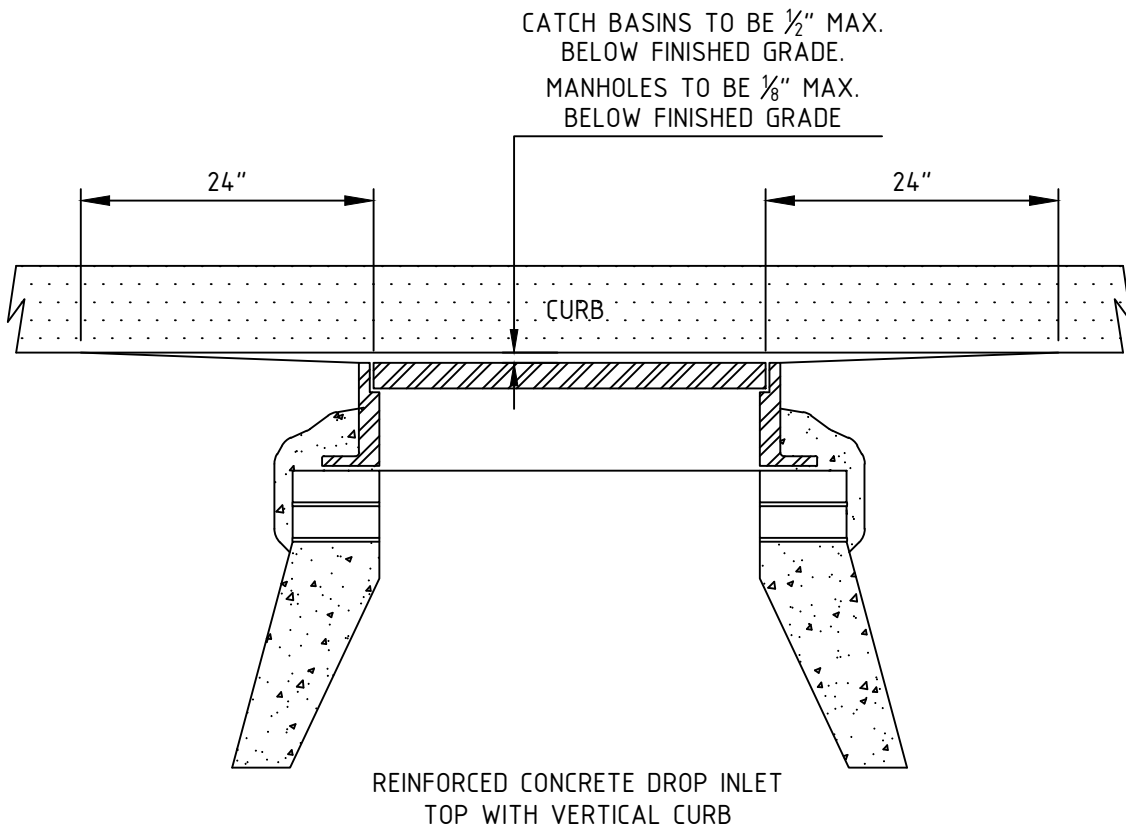
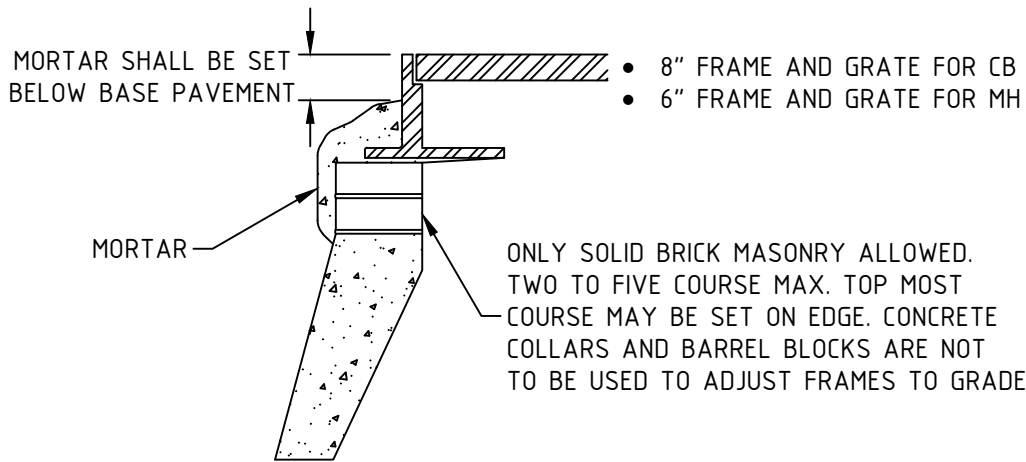
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MANHOLE JOINTS

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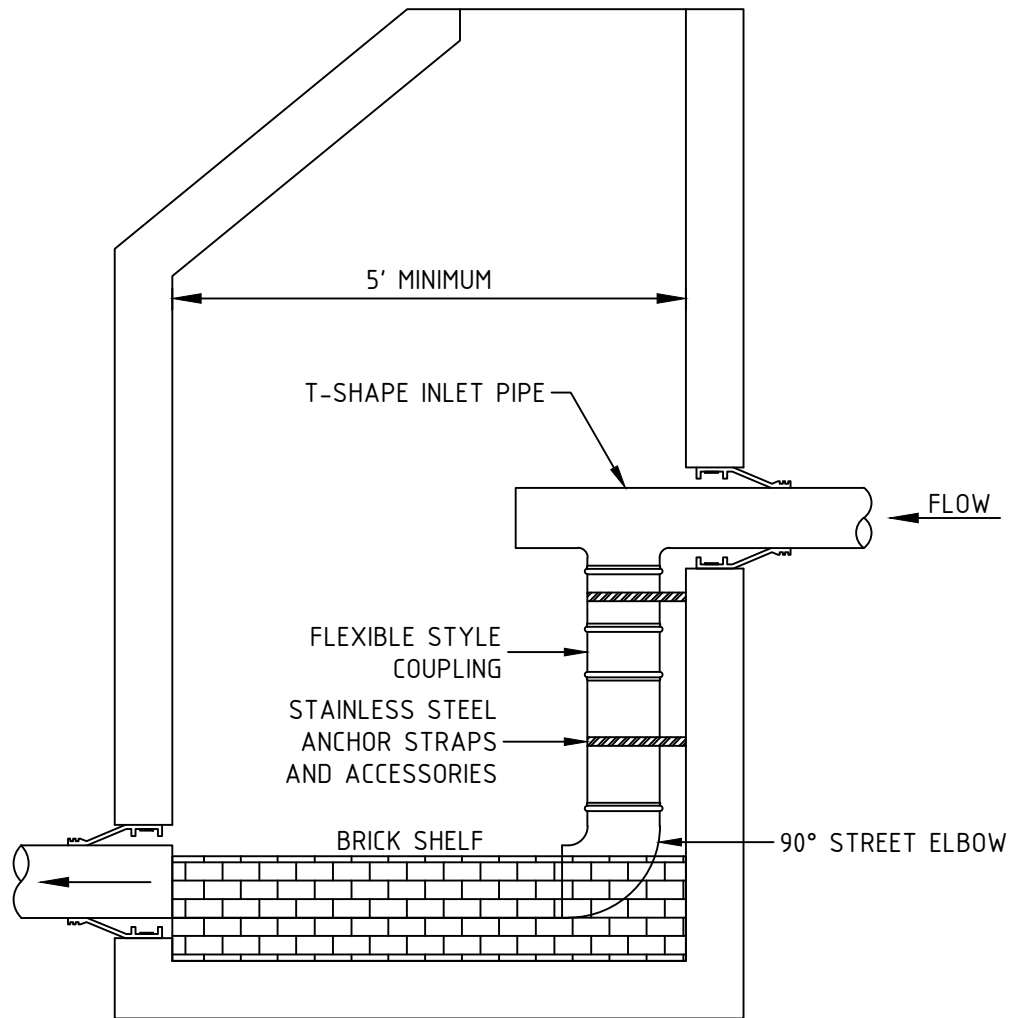
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ADJUSTING FRAMES TO GRADE

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NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE TO THE TOWN OF DURHAM STANDARDS FRO SANITARY MANHOLE CONSTRUCTION.
2. INSIDE DROP MANHOLES SHALL HAVE A MINIMUM 5' INSIDE DIAMETER.
3. IF CONNECTING TO AN EXISTING MANHOLE THAT HAS NO OTHER DROP PIPING, A SINGLE 8" INSIDE DROP WILL BE ALLOWED.
4. ANCHOR STRAPS (MINIMUM OF 2) AND BOLTS TO BE 304 OR 316 STAINLESS STEEL AND NOT MORE THAN 3' ON CENTER. SECURE AS DIRECTED: STRAPS - 1" WIDE, BOLTS $\frac{3}{8}$ " x $2\frac{1}{2}$ " LONG.

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SEWER MAIN INSIDE DROP
MANHOLE

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MINIMUM SLOPE VALUES (FT/FT)*		
PIPE SIZE	SANITARY APPLICATIONS	STORM DRAINS
8"	0.0060	N/A
10"	0.0028	N/A
12"	0.0022	0.0030
15"	0.0015	0.0023
18"	0.0012	0.0018
21"	0.0010	N/A
24"	0.0008	0.0012
27"	0.0007	N/A
30"	0.0006	0.0009
36"	0.0005	0.0007

*THESE VALUES ARE BASED ON MINIMUM VELOCITIES OF 2 FEET PER SECOND ON SANITARY SEWERS AND 2.5 FEET PER SECOND FOR STORM DRAINS WHILE FLOWING FULL. THIS VALUE SET BY THE TOWN ENGINEER.

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HYDRAULIC FLOW CHART

SECTION:

SEWER

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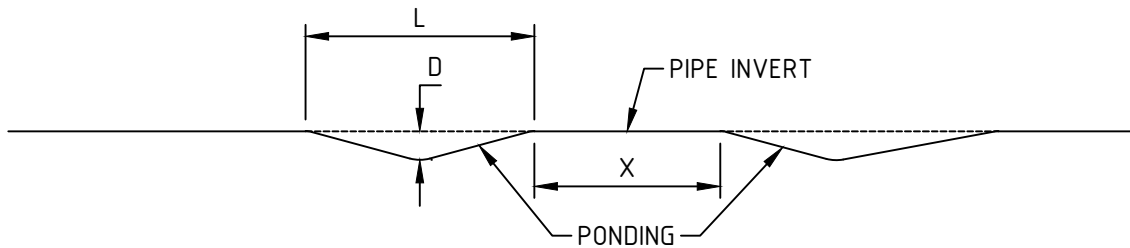
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PIPE DIAMETER	ACCEPTABLE DEPTH (D) OF SAG	MAXIMUM SAG REQUIREMENTS		
		MAXIMUM ALLOWABLE DEPTH (D) OF SAG	MAXIMUM ALLOWABLE LENGTH (L) OF SAG	MINIMUM ALLOWABLE DISTANCE (X) BETWEEN SAGS
4"	NONE	NONE	NONE	NONE
6"	NONE	NONE	NONE	NONE
8"	¼"	½"	4 FT	40 FT
10"	¼"	½"	6 FT	60 FT
12" & LARGER	¼"	½"	8 FT	80 FT



NOTES:

1. 4" AND 6" LINES ARE FOR SERVICE CONNECTIONS ONLY AND ARE LAID AT A MINIMUM OF 2% AND 1% RESPECTIVELY TO ELIMINATE SAGS.
2. MANDREL TESTING REQUIRED PER NHDOT SPECIFICATIONS. ALL PLASTIC SEWER PIPE SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION.
3. THE MAXIMUM ALLOWABLE DEFLECTION OF SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER.
4. SAGS BETWEEN ¼" AND ½" WILL BE REJECTED WHEN CRITERIA FOR MAXIMUM ALLOWABLE LENGTH OF SAG AND/OR MINIMUM ALLOWABLE DISTANCE BETWEEN SAGS ARE NOT MET.

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LIMIT OF SAGS IN PVC
SANITARY SEWER PIPE

SECTION:

SEWER

DWG #:

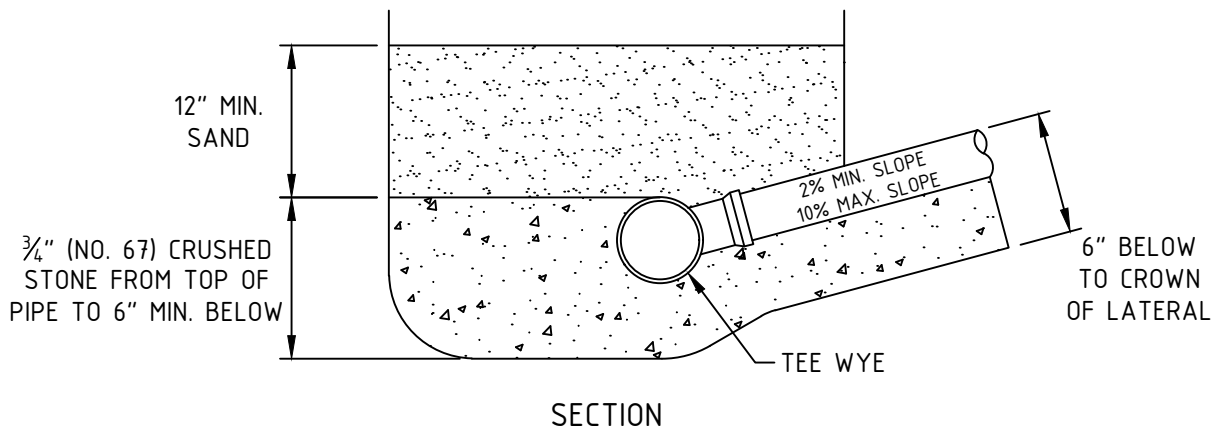
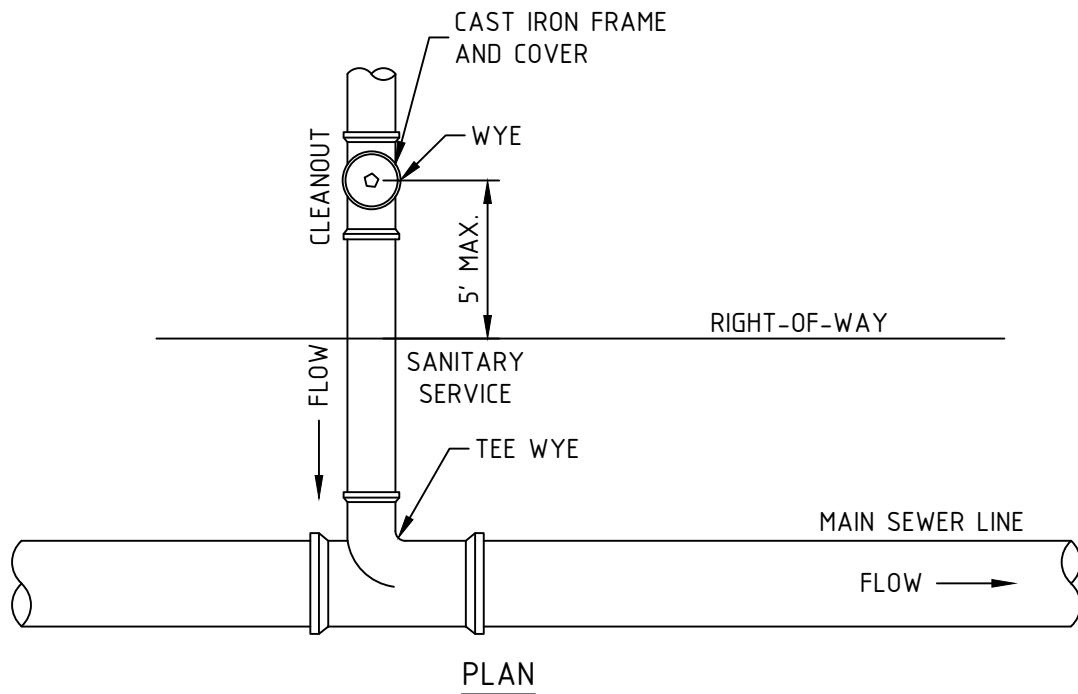
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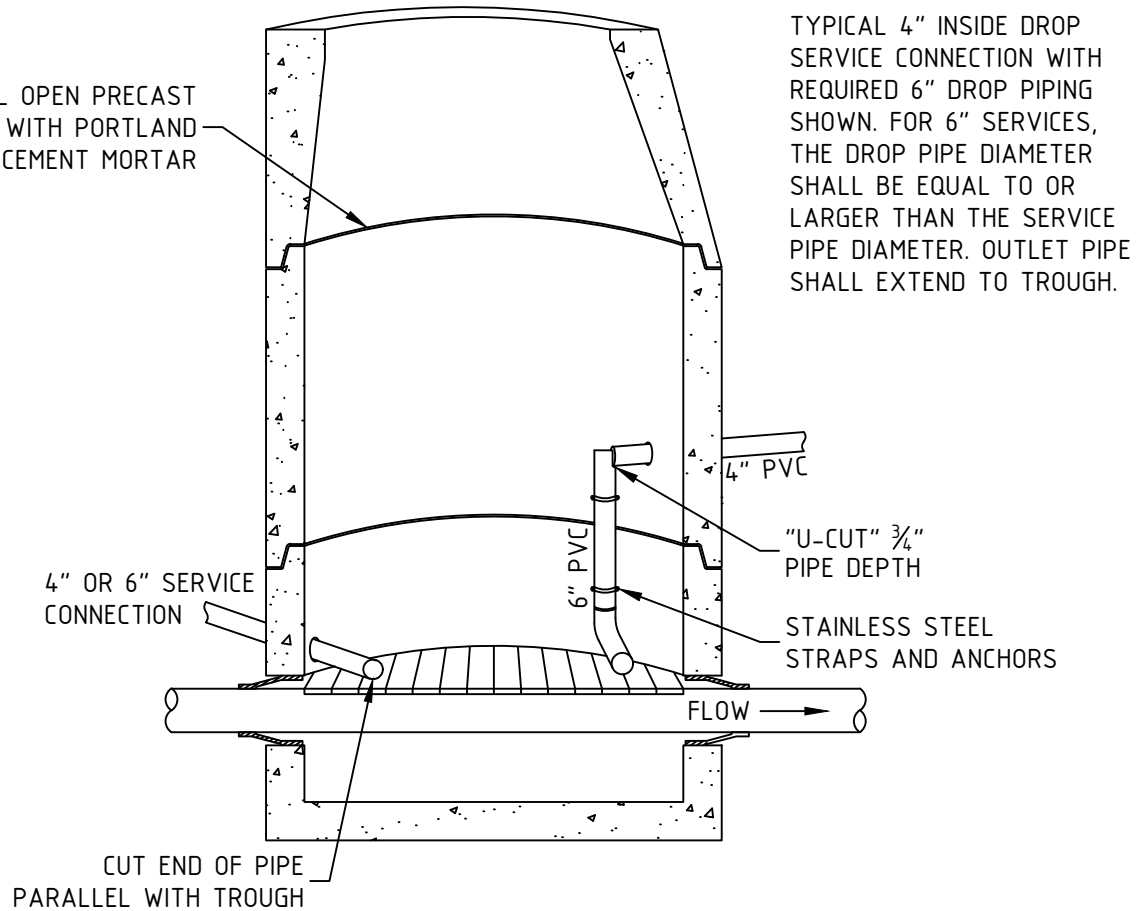


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SEWER SERVICE CONNECTION
AT MAIN

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SEAL ALL OPEN PRECAST JOINTS WITH PORTLAND CEMENT MORTAR



TYPICAL 4" INSIDE DROP SERVICE CONNECTION WITH REQUIRED 6" DROP PIPING SHOWN. FOR 6" SERVICES, THE DROP PIPE DIAMETER SHALL BE EQUAL TO OR LARGER THAN THE SERVICE PIPE DIAMETER. OUTLET PIPE SHALL EXTEND TO TROUGH.

SHOULD THE SERVICE CONNECTION ENTER A STRUCTURE MORE THAN 24" ABOVE THE INVERT, A DROP CONNECTION WILL BE NECESSARY.

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SEWER SERVICE CONNECTION
/ INSIDE DROP MANHOLE

SECTION:

SEWER

DWG #:

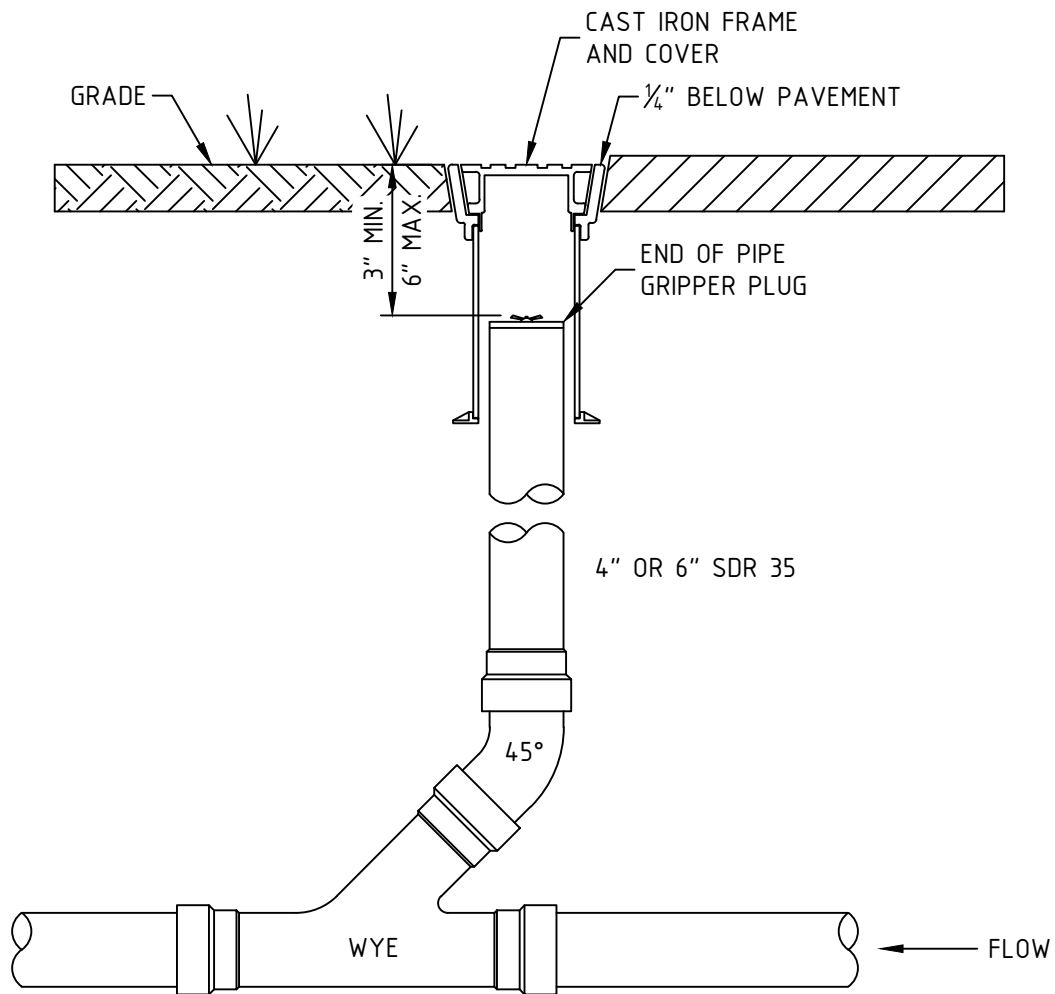
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CLEANOUTS ON SERVICE
LATERALS

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SEWER

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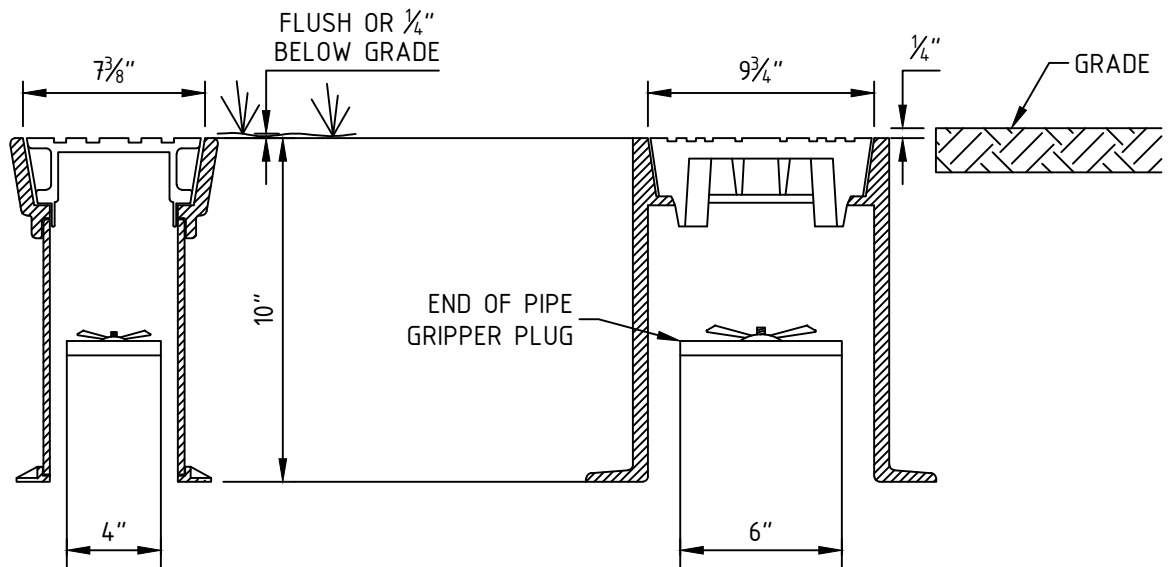
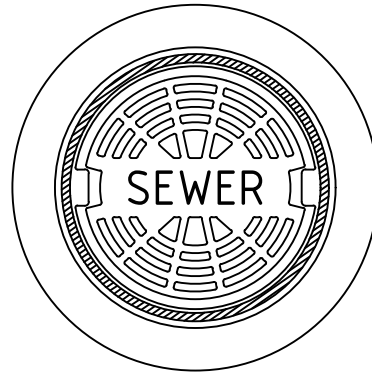
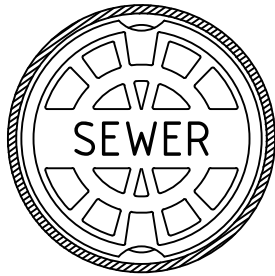
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CLEANOUT COVERS

4" OR 6"

SECTION:

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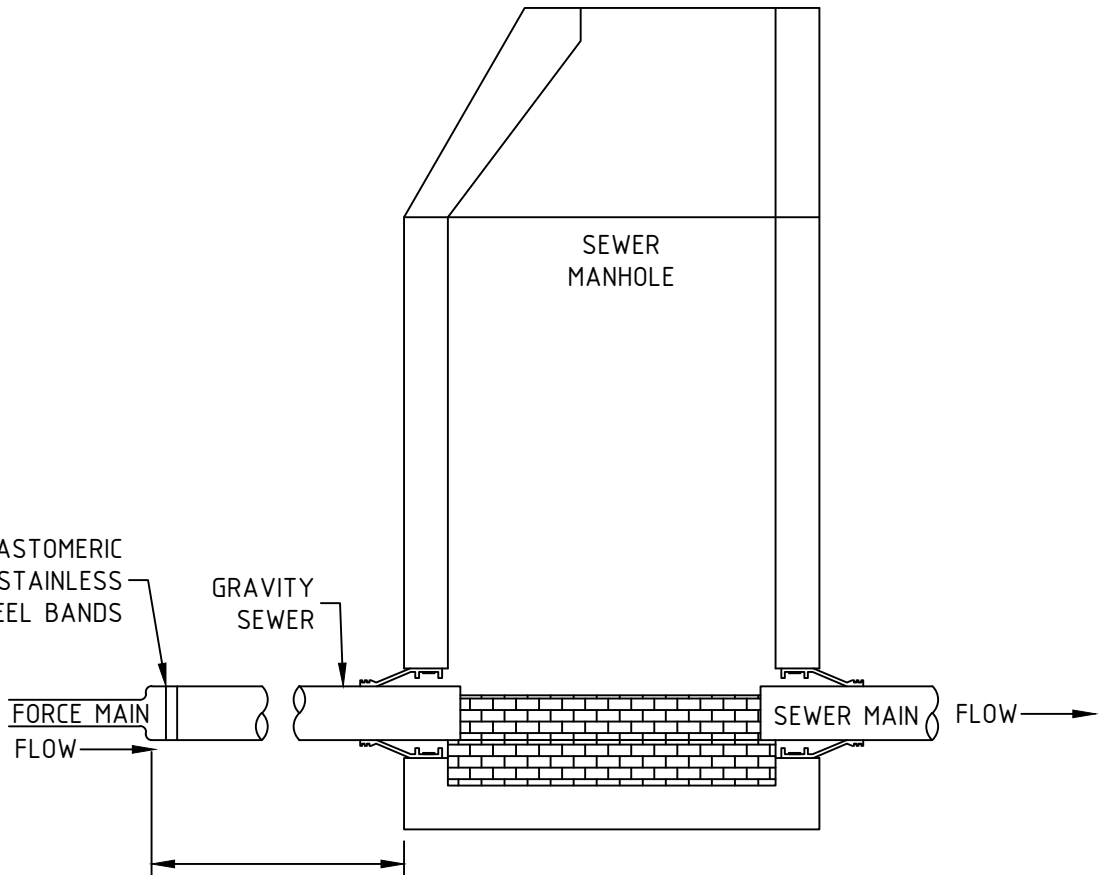
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PVC REDUCER OR ELASTOMERIC
PVC COUPLING WITH STAINLESS
STEEL BANDS



TRANSITION FROM FORCE MAIN TO GRAVITY
SEWER SHOULD OCCUR A MINIMUM OF 10' FROM
A MANHOLE FOR SEWER MAINS AND AT THE
RIGHT-OF-WAY LINE FOR SEWER SERVICES.

NOTE:
FOR BRICK SHELF CONSTRUCTION, REFER TO
SANITARY BRICK SHELF CONSTRUCTION DETAIL.

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FORCE MAIN CONNECTION

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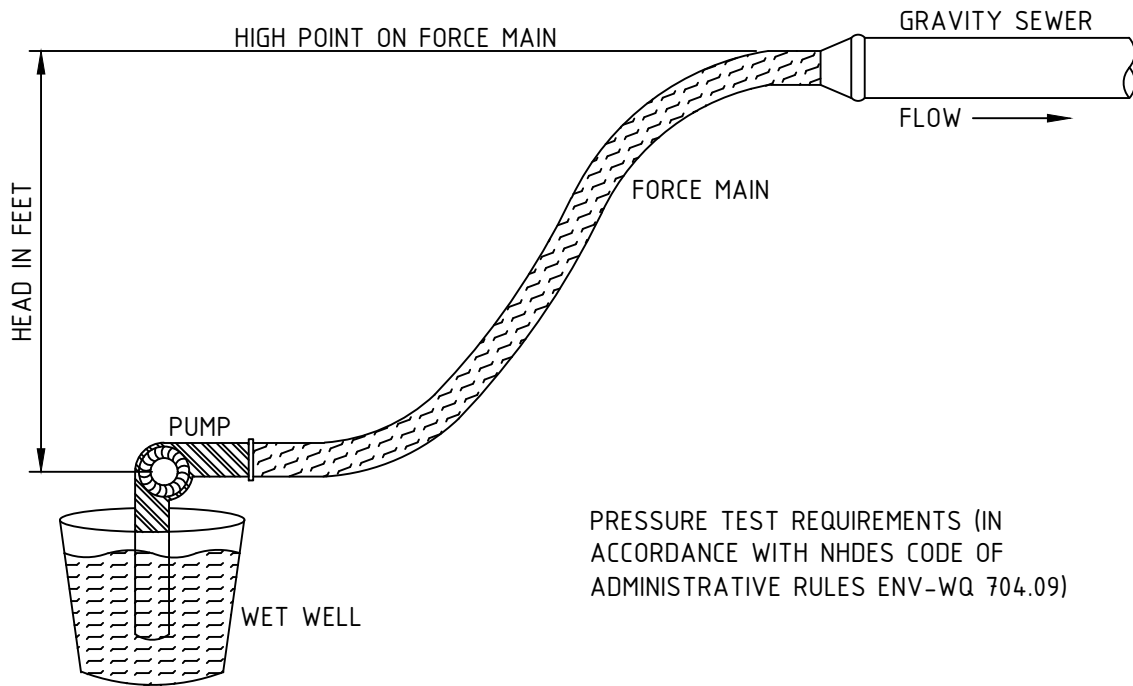
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PRESSURE TEST REQUIREMENTS (IN ACCORDANCE WITH NHDES CODE OF ADMINISTRATIVE RULES ENV-WQ 704.09)

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FORCE MAIN TESTING REQUIREMENTS

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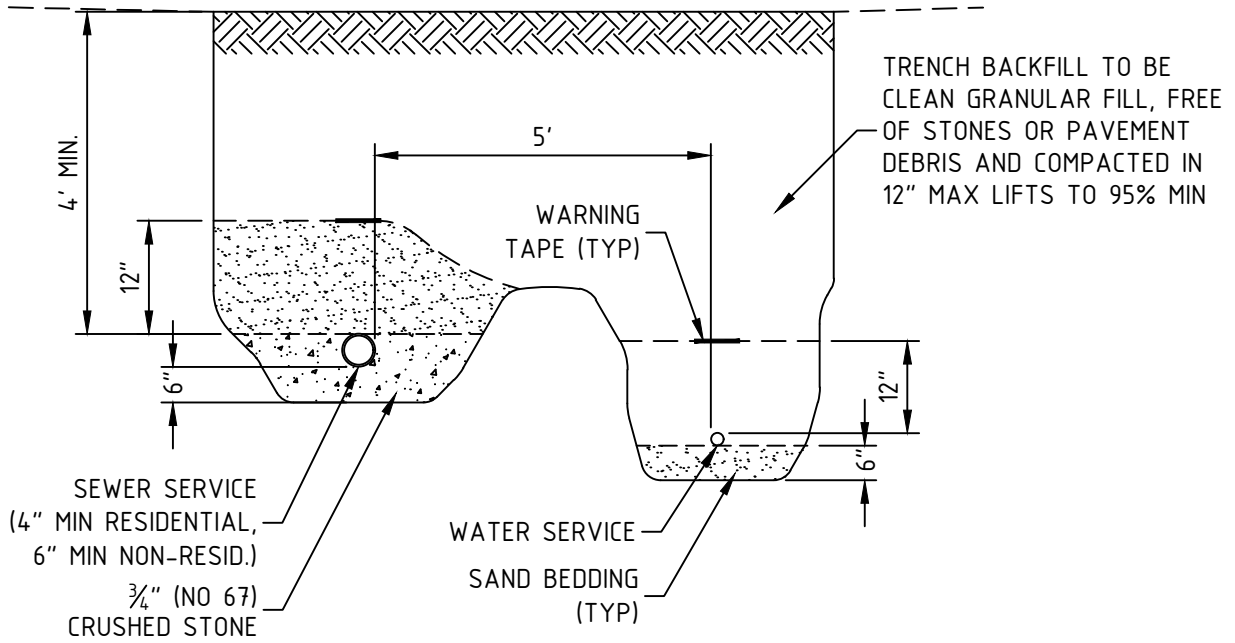
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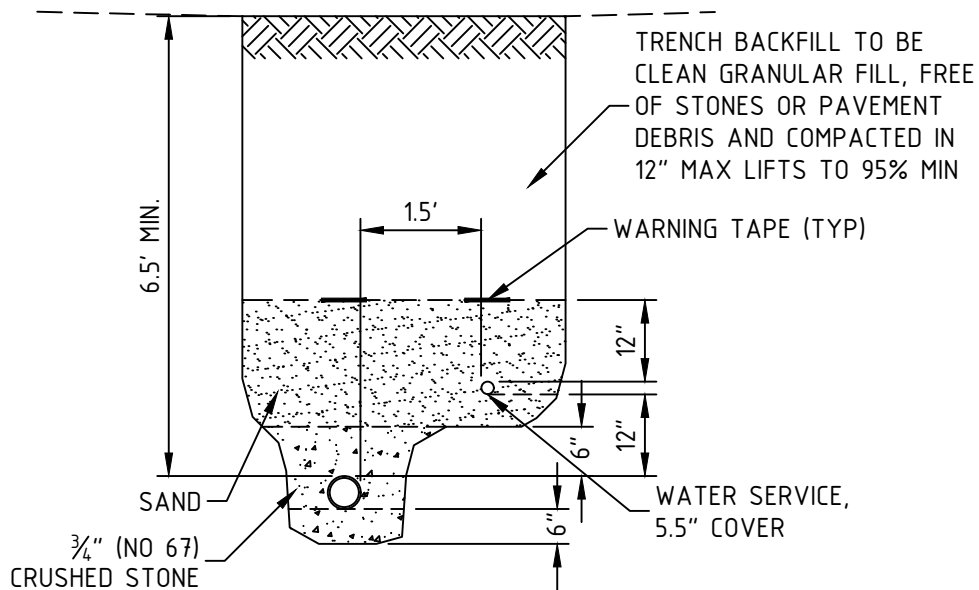
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NOTE:
ALL DIMENSIONS ARE MINIMUM.



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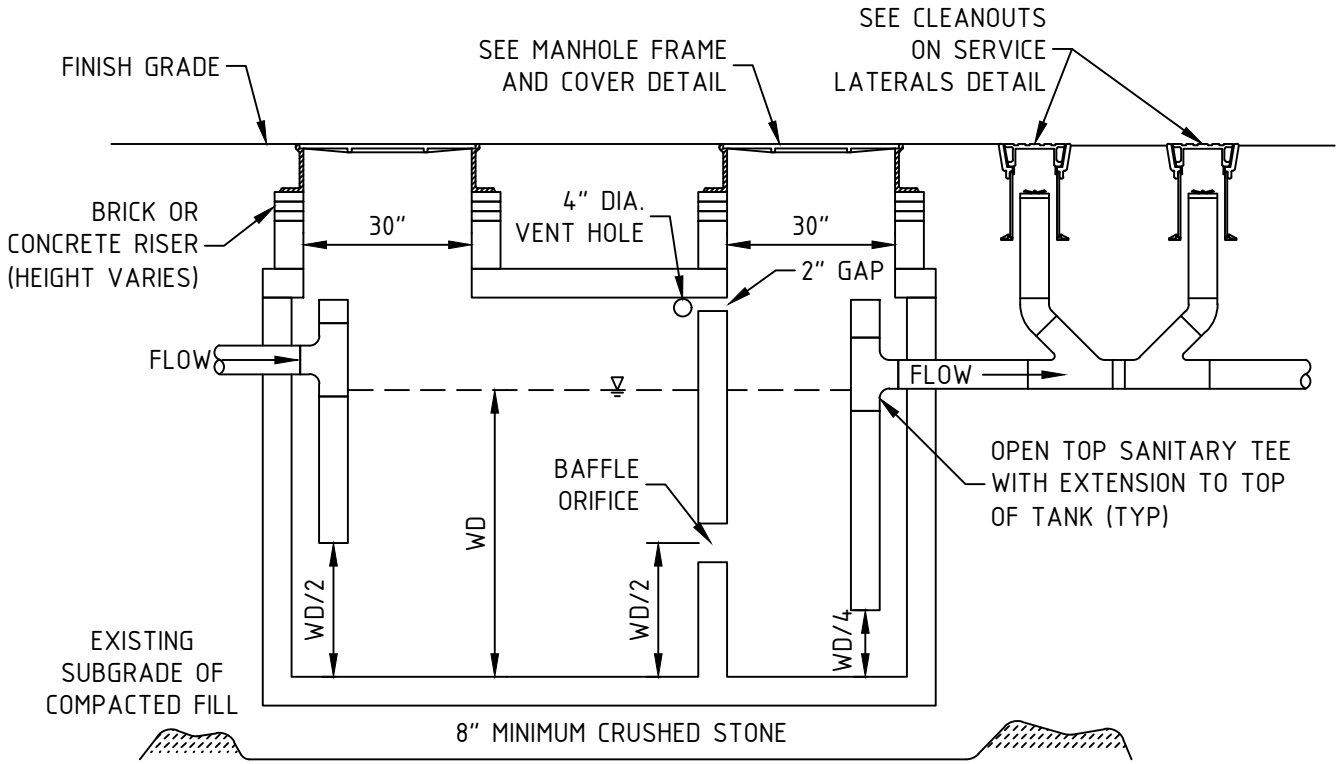
WATER AND SEWER SERVICE TRENCH

SECTION: SEWER-WATER

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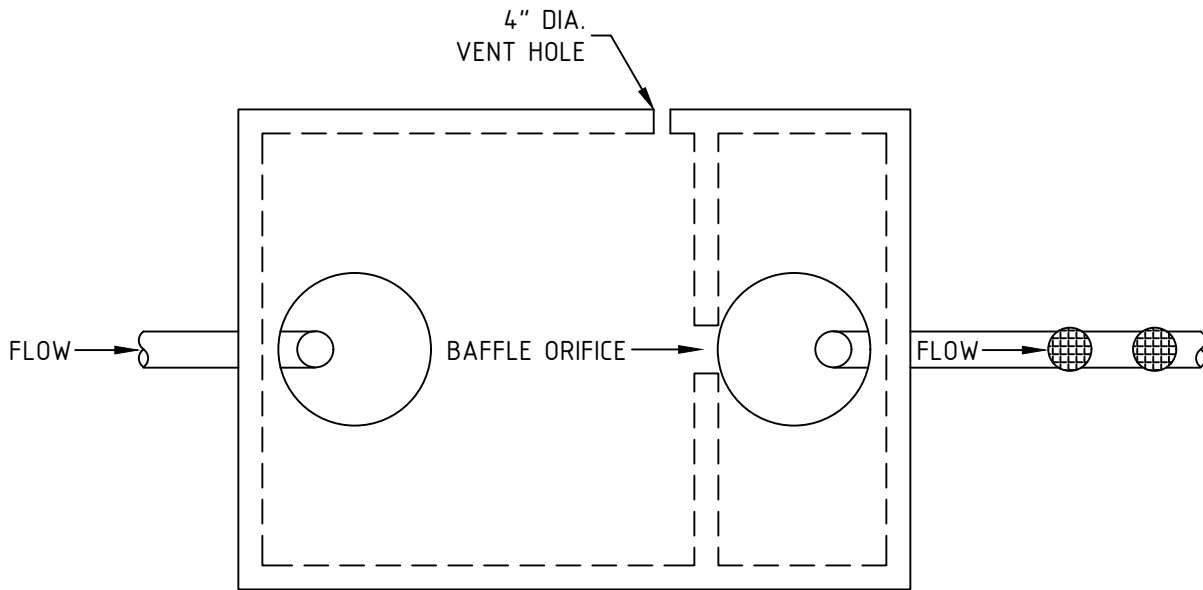
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* GREASE INTERCEPTOR SHALL BE DESIGNED TO H-20 LOADING REQUIREMENTS

SECTION



PLAN

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TYPICAL EXTERNAL GREASE INTERCEPTOR

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