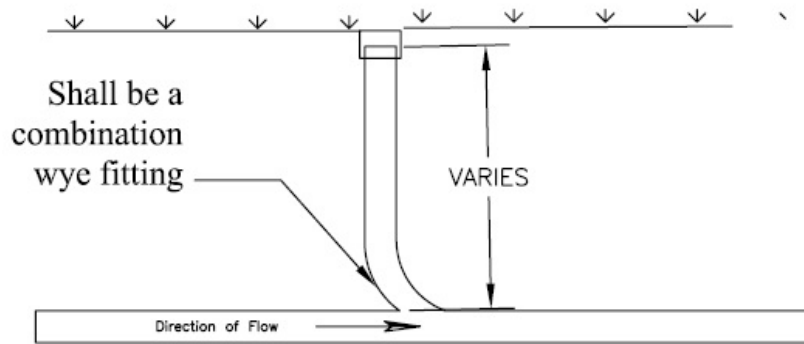
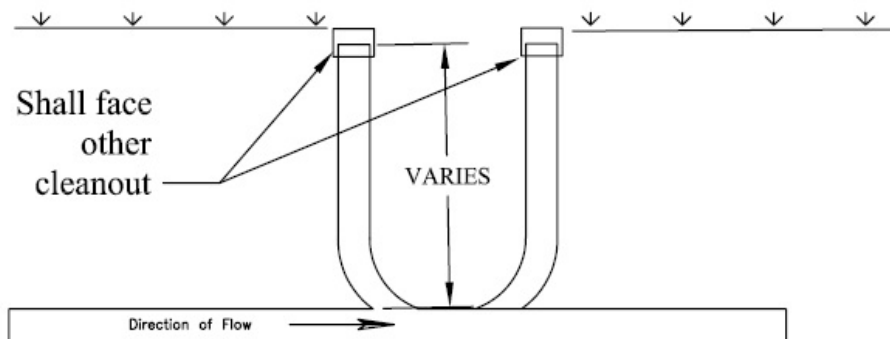


## Option One




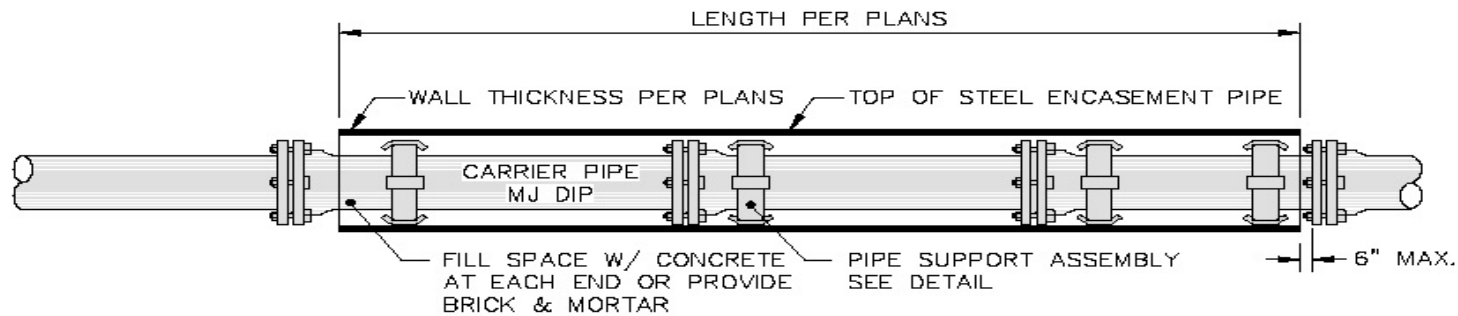
## Option Two



### NOTE:

- A. Cleanouts shall be placed within two feet (or approved distance) of the structure and every 100 feet of distance or change of horizontal direction of 135° or more.
- B. All cleanouts shall be extended to finished grade.
- C. Cleanouts installed under asphalt or concrete shall have a metal ring and cover with the word "sewer" cast in the lid set to grade.
- D. Cleanout materials shall be the same as the sanitary sewer pipe.
- E. Cleanouts shall be the same size as the sanitary sewer pipe.
- F. Upon approval manholes can be substituted for cleanouts with a maximum distance of 300 feet between manholes.
- G. For cleanouts in traffic areas refer to Standard 308.
- H. Plug assembly shall be a raised MIP plug GPK 228 or equivalent.
- I. Option two can be used when there is no up stream cleanout or terminal cleanout.

Operations Division	<b>TYPICAL PROPERTY LINE CLEAN-OUT DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 01</b>




### ENCASEMENT PIPE DETAIL

CARRIER PIPE		CASING PIPE				PIPE SUPPORT ASSEMBLY MARK NUMBER								DIMENSIONS			
NOMINAL DIA.	O.D.	RAILROAD		HIGHWAY		①		②			③			4	X	Y	Z
		O.D.	WALL	O.D.	WALL	C	W	T	B	A	T	B	T				
6"	6.90"	12"	.251"	12"	.188"	5"	2"	3/8"	3"	1"	3/8"	3"	3/8"	1/2" DIA. 1 REQ'D	10.40"	1 7/8"	3/4"
8"	9.05"	16"	.282"	16"	.188"	6"	2"	3/8"	4"	1 3/4"	3/8"	3"	3/8"	1/2" DIA. 1 REQ'D	14.05"	1 7/8"	3/4"
10"	11.10"	24"	.407"	24"	.188"	6"	2"	3/8"	4"	4 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.10"	3"	1 3/8"
12"	13.20"	24"	.407"	24"	.188"	6"	2"	3/8"	4"	3 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.20"	3"	1 3/8"
14"	15.30"	24"	.407"	24"	.250"	6"	2"	3/8"	4"	2 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.30"	3"	1 3/8"
16"	17.40"	30"	.469"	30"	.250"	8"	3"	3/8"	6"	4 1/4"	3/8"	6"	3/8"	3/4" DIA. 1 REQ'D	27.40"	3"	1 3/8"
18"	19.50"	30"	.469"	30"	.250"	8"	3"	3/8"	6"	3 1/4"	3/8"	6"	3/8"	3/4" DIA. 1 REQ'D	27.50"	3"	1 3/8"
24"	25.80"	42"	.563"	42"	.312"	12"	4"	1/2"	10"	5 3/4"	1/2"	10"	1/2"	1/2" DIA. 2 REQ'D	39.30"	3"	1 3/8"
30"	32.00"	42"	.563"	42"	.312"	12"	4"	1/2"	10"	2 1/2"	1/2"	10"	1/2"	1/2" DIA. 2 REQ'D	39.00"	3"	1 3/8"

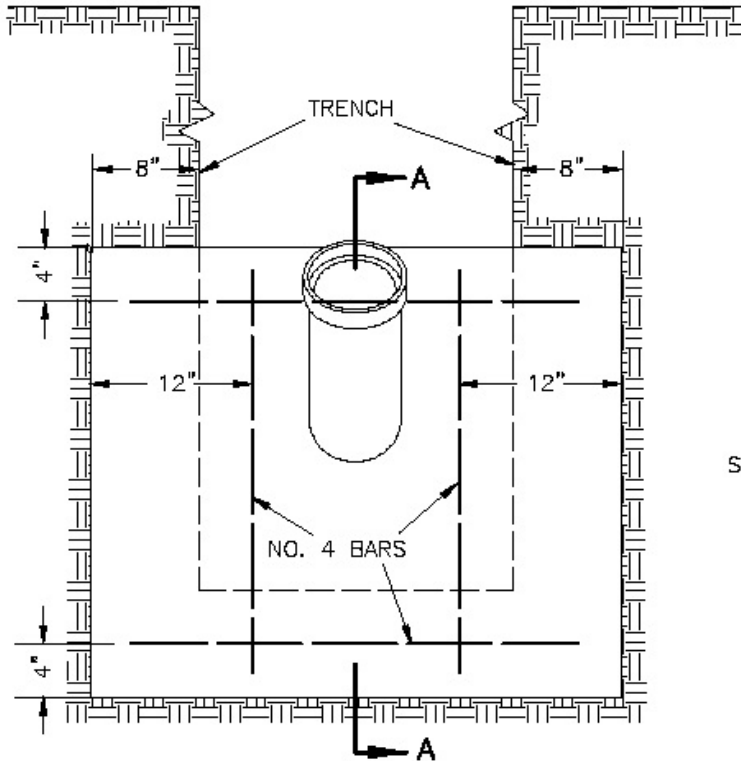
\* DIMENSIONS ARE WITHOUT COATINGS

**NOTES:**

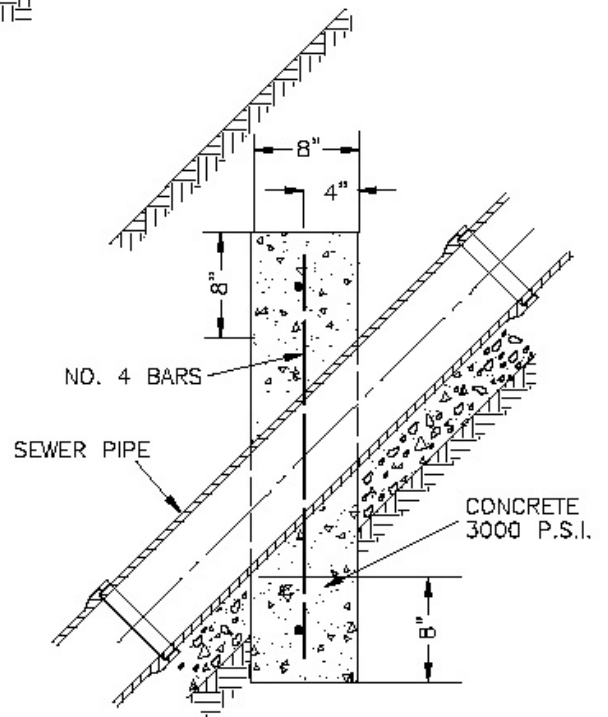
1. GREASE ENCASEMENT PIPE AS REQUIRED FOR EASE OF INSTALLATION.
2. INSTALLATION BY DRY BORE & JACKING.
3. STEEL PIPE TO BE 35,000 PSI MIN. YIELD STRENGTH.
4. PROVIDE A 2" DRAIN PIPE FROM CASING PIPE AT DOWNSTREAM INVERT OF CASING PIPE. DRAIN TO DAYLIGHT OR FRENCH DRAIN.

Operations Division	<b>CASING DETAILS (PIPE BORE)</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 10</b>

## FOR SEWER PIPE 8"–12" DIAMETER



ELEVATION



SECTION A-A

### SPACING FOR ANCHOR BLOCK FOR ALL SIZES

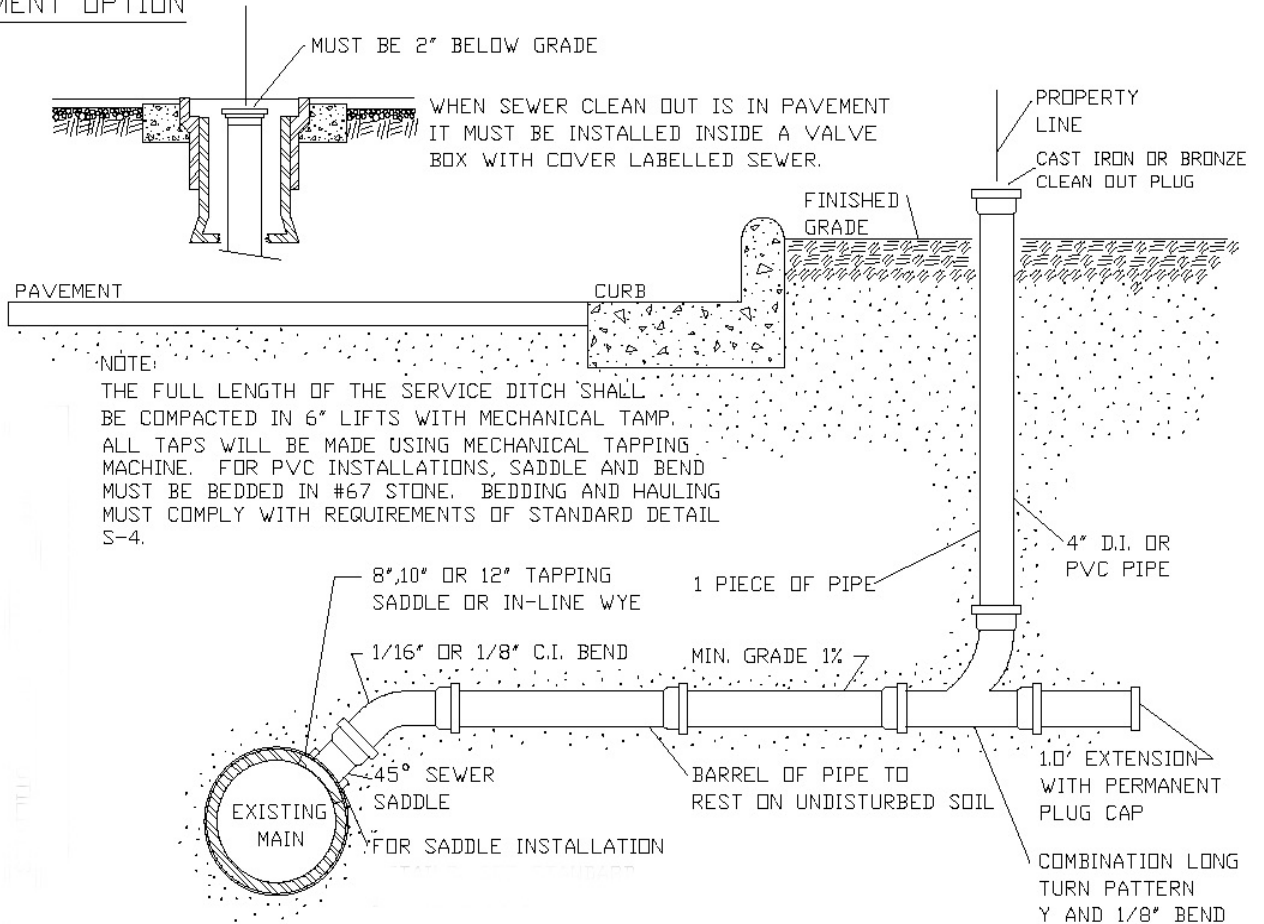
SLOPE %	MINIMUM SPACING (FT)
0–19.99	NO ANCHOR REQUIRED
20–34.99	35
35–50.99	25
51–MORE	15' OR SPECIAL DESIGN

**NOTE:**


1. FOR 4" SEWER PIPE, ANCHOR BLOCK IS REQUIRED AS SHOWN EXCEPT NO REINFORCEMENT IS REQUIRED
2. FOR PIPE LARGER THAN 12", ANCHOR BLOCK SHALL BE OF SPECIAL DESIGN.
3. ANCHOR BLOCK SHALL ALWAYS BE LOCATED ALONG THE BARREL OF THE PIPE AND NOT AT THE JOINT.
4. OTHER PIPE SLOPE ANCHOR SYSTEMS WILL BE CONSIDERED FOR APPROVAL UPON REQUEST TO ENGINEER.

Operations Division	<b>ANCHOR BLOCK DETAIL, SANITARY SEWER PIPE</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 11</b>

PAVEMENT OPTION

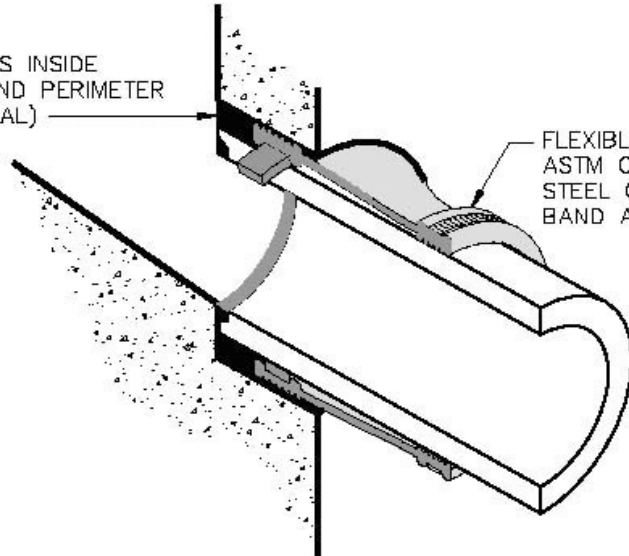


\* REQUIRED CLEAN-OUT NOT SHOWN ON DETAILS

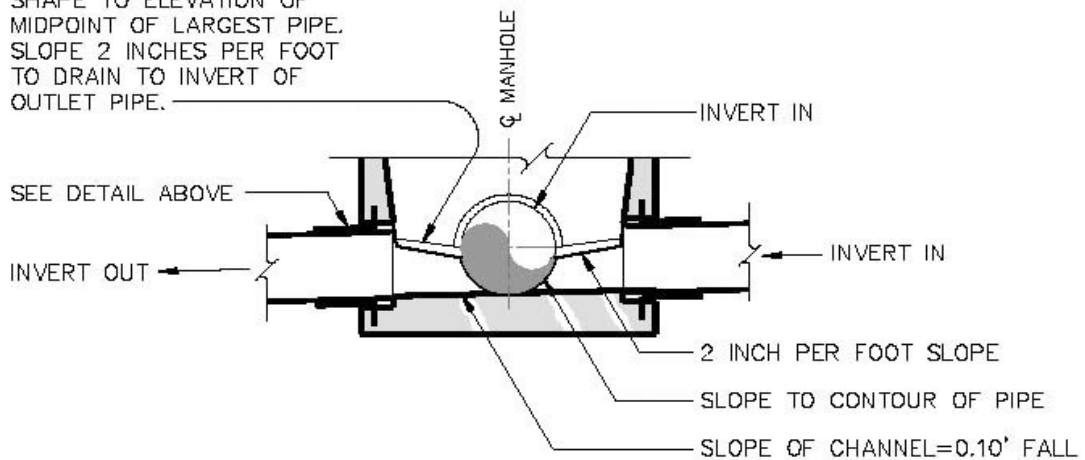
Operations Division	<b>STANDARD SANITARY SEWER LATERAL CONNECTION</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 12</b>

GROUT OPENINGS INSIDE  
MANHOLE AROUND PERIMETER  
OF PIPE. (TYPICAL)

FLEXIBLE RUBBER BOOT  
ASTM C923 W/STAINLESS  
STEEL COMPRESSION  
BAND AND CLAMPS




SHAPE TO ELEVATION OF  
MIDPOINT OF LARGEST PIPE.  
SLOPE 2 INCHES PER FOOT  
TO DRAIN TO INVERT OF  
OUTLET PIPE.

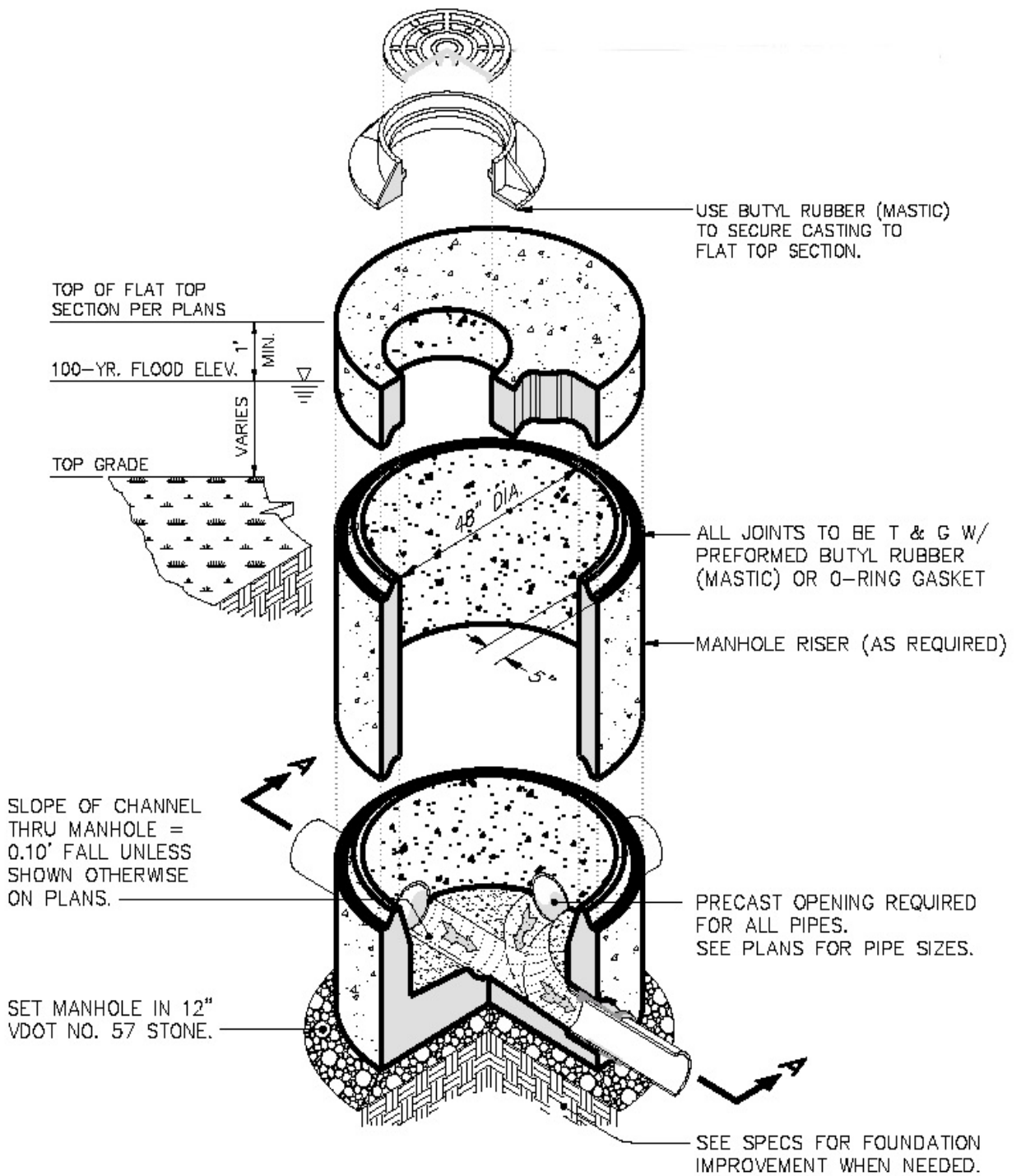



**SECTION A-A**

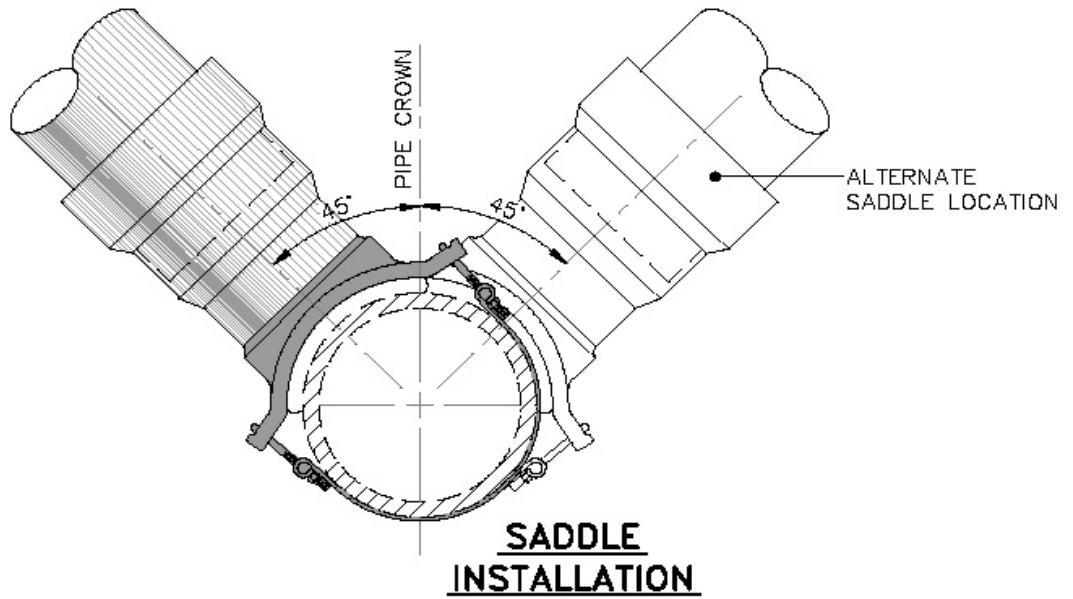
**NOTES:** 

1. ALL SERVICE LATERALS INTO MANHOLE TO BE CORF DRILLED AND BOOTED.
2. MAXIMUM DEPTH 4' DIAMETER MANHOLE = 20' (SEE SEWER DESIGN SECTION FOR OTHER REQUIREMENTS / LIMITATIONS).
3. THE INVERT SHAPING AS SHOWN SHALL CONSIST OF 3,000 PSI CONCRETE TROWELLED TO A SMOOTH SURFACE WITH NO AGGREGATE EXPOSED.
4. DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE IS TO BE SHAPED INDIVIDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.
5. WHEN DIFFERENT DIAMETER PIPES ARE USED FROM INVERT IN TO INVERT OUT, PROVIDE A SMOOTH TRANSITION THROUGH THE INVERT.

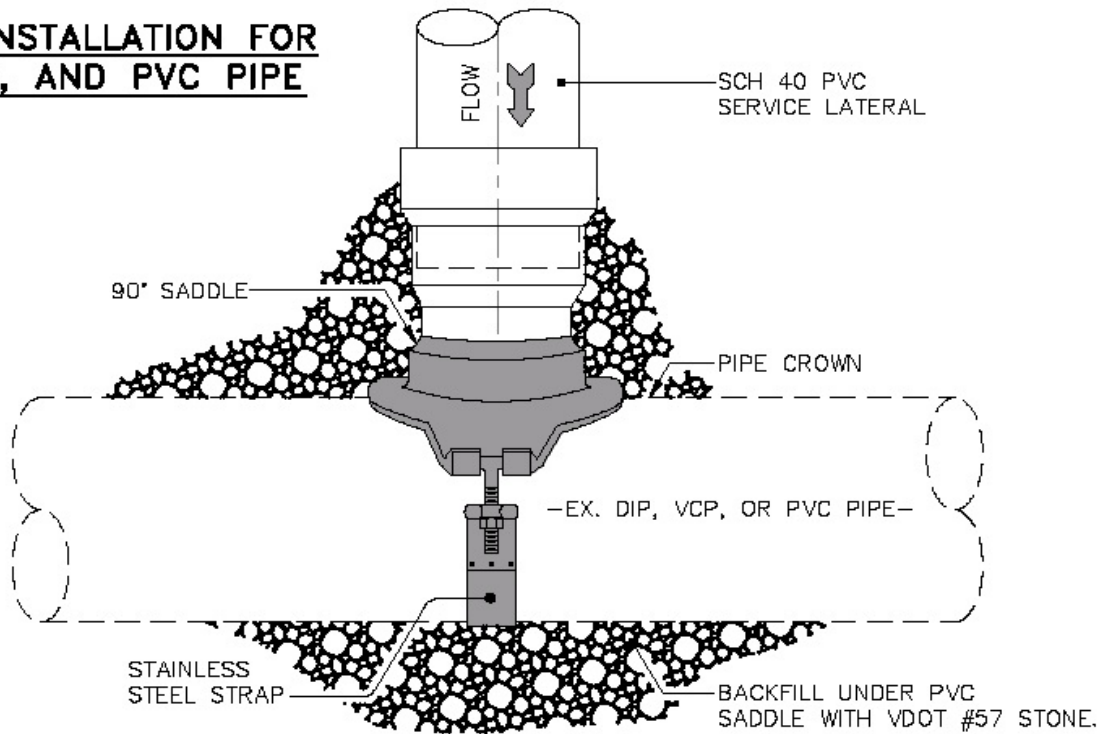
Operations Division	<b>4' FLAT TOP PRECAST MANHOLE - STANDARD</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 13</b>




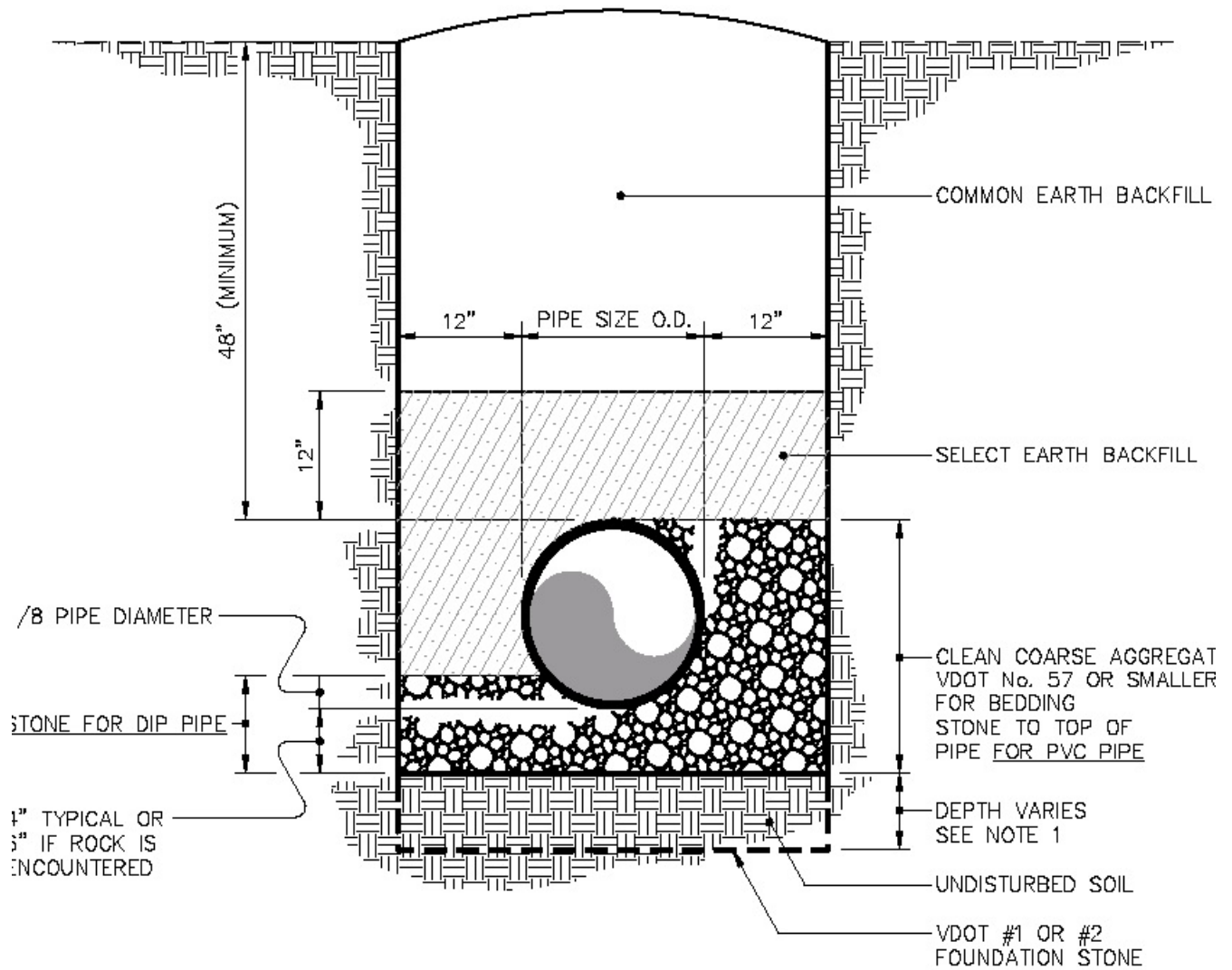
Operations Division	<b>4' FLAT TOP PRECAST MANHOLE - STANDARD</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 14</b>



**SADDLE INSTALLATION FOR  
DIP, VCP, AND PVC PIPE**




Operations Division	<b>TYPICAL LATERAL SADDLE DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 15</b>

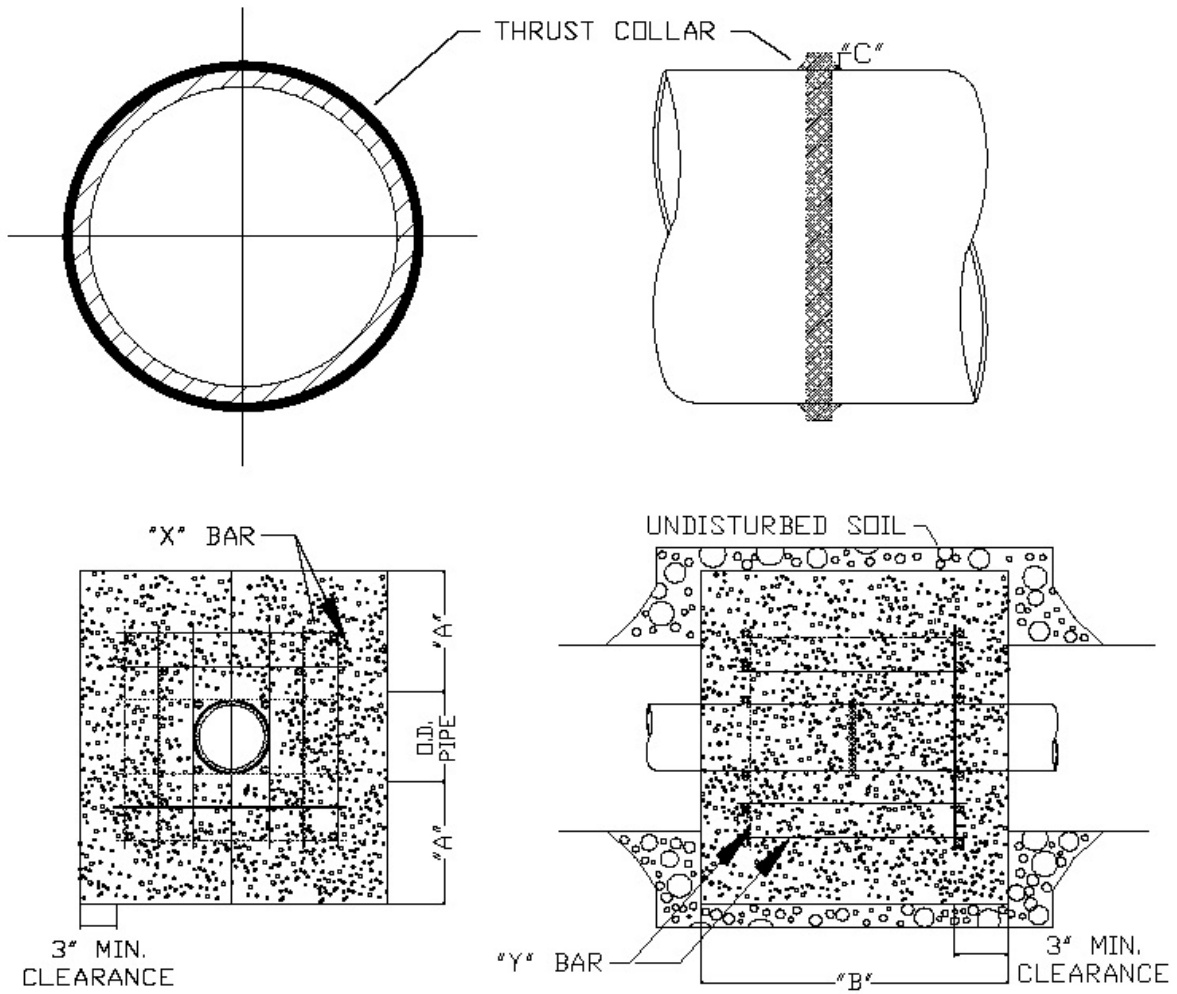


**NOTES:**

1. FOUNDATION STONE SHALL BE REQUIRED WHEN SOIL CONDITIONS ARE UNSUITABLE.
2. EXTRA DEPTH EXCAVATION SHALL BE PAID FOR AS ANYTHING BEYOND 4' OF COVER TO TOP OF PIPE.
3. AN ADDITIONAL 1 INCH DEPTH OF BEDDING MATERIAL WILL BE REQUIRED FOR EACH ADDITIONAL 2 FEET OF TRENCH DEPTH IN EXCESS OF 16 FEET UP TO A MAXIMUM OF 12 INCHES.

Operations Division	<b>DI, PVC SEWER PIPE (SDR-35) TRENCH DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 16</b>





REINFORCING REQUIREMENTS


I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2" + O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0" + O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

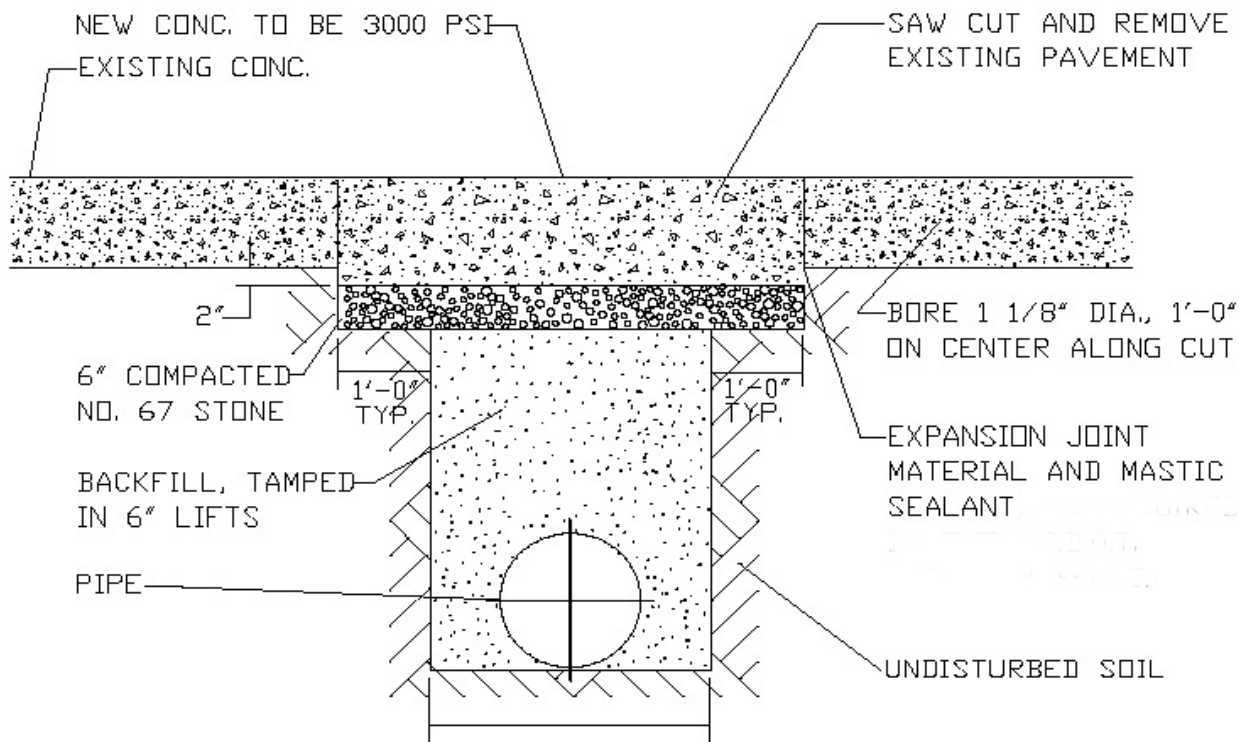
THRUST COLLAR, AND THRUST SCHEDULE


I.D. PIPE	"A"	"B"	"C" - 6"-16", 20"-24", 30"-36", 48"
6" - 36"	1'-4"	1'-7"	2" 3" 4"
48" & greater	1'-8"	1'-9"	6"

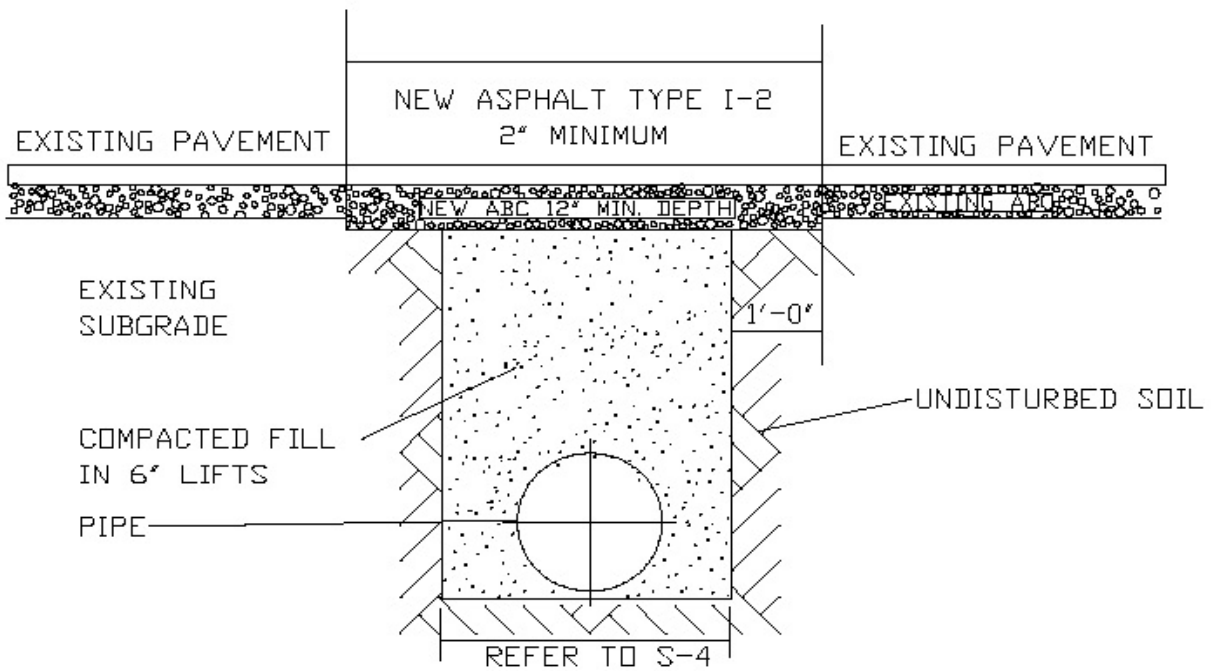
NOTES:

1. SEE STANDARD DETAIL S-7 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH
5. BACKFILL TAMPED IN 6" LIFTS
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

Operations Division	<b>SEWER FORCE MAIN THRUST BLOCK DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER -17</b>




Operations Division	<b>STANDARD CONCRETE PAVEMENT PATCH DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 18</b>

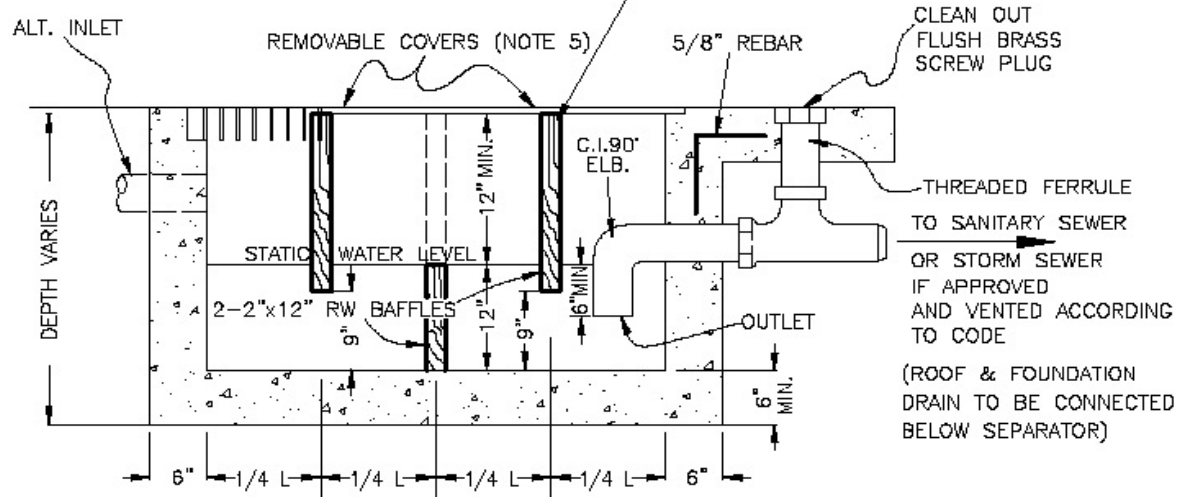
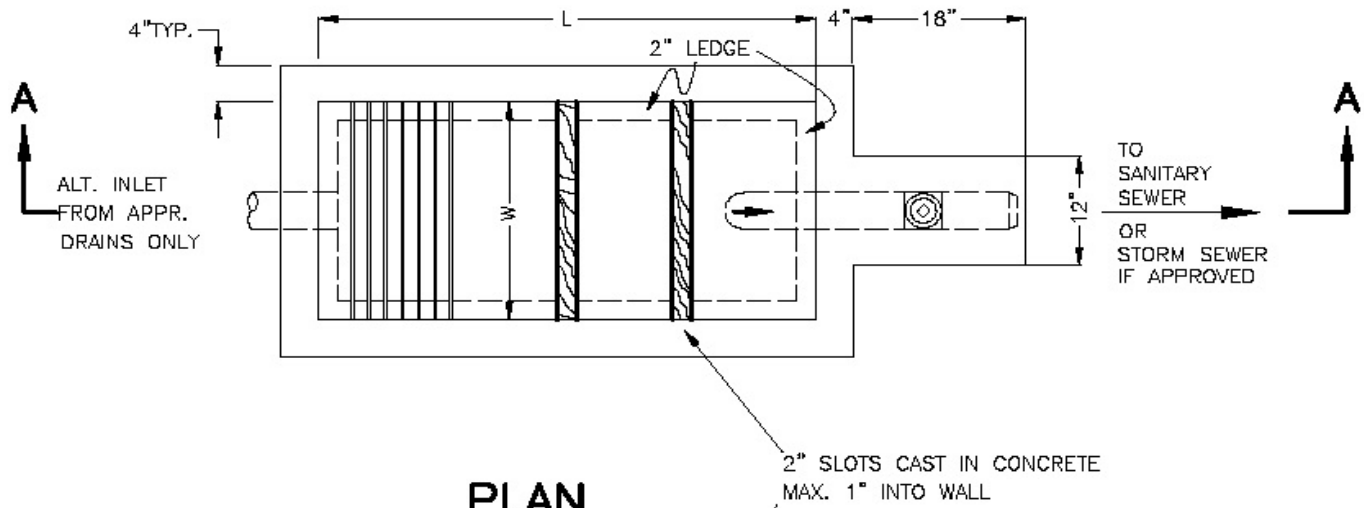


**NOTES:**

& S-5

1. The pavement cut shall be defined by a straight edge preferably a machine saw cut.
2. The trench subgrade material shall be backfilled with suitable material and compacted to a density of at least 95% of that obtained by compacting a sample of the material in accordance with AASHTO T-99.
3. The final 1' of fill shall consist of ABC material compacted to a density equal to 100% of that obtained by compacting a sample of the material in accordance with AASHTO T-80.
4. The entire thickness and vertical edge of cut shall be tacked.
5. The same depth of pavement material which exists shall be reinstalled, but in no case shall the asphalt be less than 2" thick.
6. The asphalt pavement material shall be installed and compacted thoroughly to achieve a smooth level patch.

Operations Division	<b>STANDARD ASPHALT PAVEMENT DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 19</b>



**SECTION A-A**

- NOTES:
1. MIN. 2'x2' OPENING FOR CLEANING.
  2. MIN. 1' DEPTH UNDER INVERT OF OUTLET PIPE.
  3. INLET & OUTLET PIPE PIPE SHALL BE SAME SIZE, 3" MIN.
  4. FOR MORE DETAILS SEE PLBG. CODE 1001,1008.
  5. COVERS PER VALLEY IRON & STEEL CO. OR EQUAL.
  6. FOR USE OUTSIDE OF BLDG. ONLY.
  7. ALL BAFFLES SHALL BE 2"x12" REDWOOD.
  8. IN LIEU OF DETAILS IN THIS DRAWING, PRECAST UNITS MANUFACTURED COMMERCIALY SUCH AS THE 'UTILITY VAULT' 660 SERIES, OR APPROVED EQUAL, MAY BE USED.

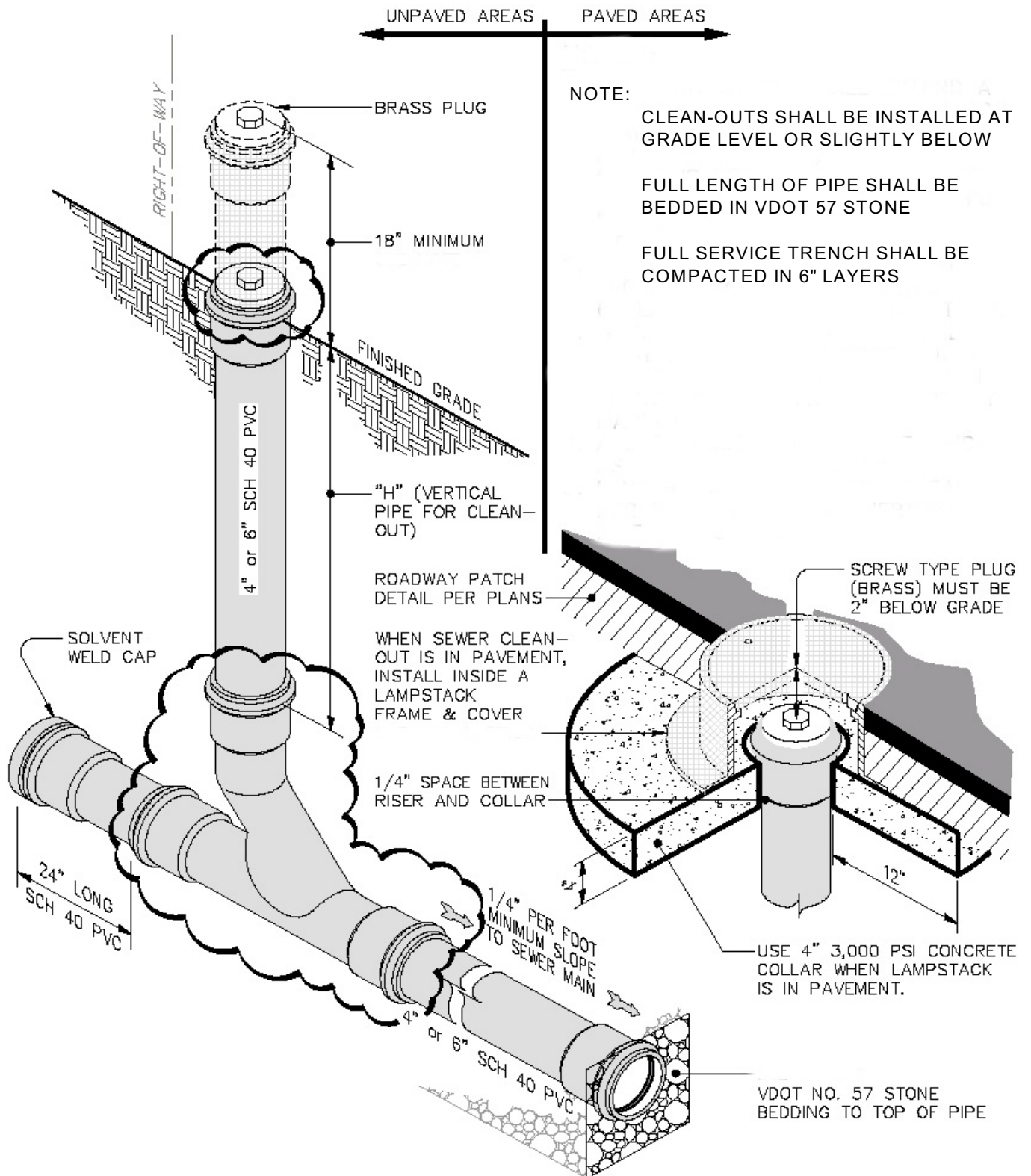
TANK SIZE FOR DIFFERENT INFLOWS (GALLONS/DAY)


1" THICKNESS (NOTE #5)

GPD	L	W	GRATE	SOLID COVER
400	4'	2'	12"x24"	24"x36"
600	5'	2'-6"	15"x30"	30"x45"
800	6'	3'	18"x36"	36"x54"

INTERCEPTOR SHALL BE SIZED IN ACCORDANCE WITH CHAPTER 10 "TRAPS, INTERCEPTORS AND SEPARATORS" OF THE INTERNATIONAL PLUMBING CODE (IPC).

Operations Division	<b>TYPICAL OIL AND SAND SEPARATOR</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 02</b>

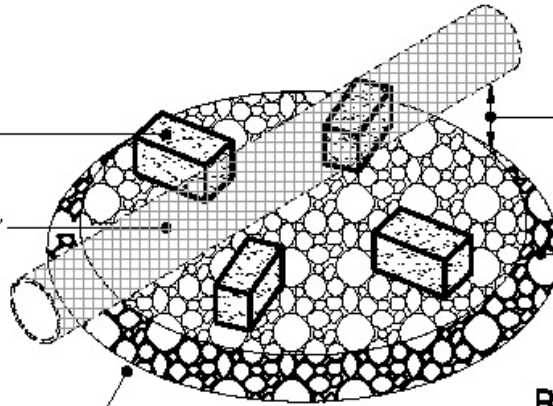


Operations Division	<b>TYPICAL IN-LINE WYE CLEAN-OUT DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 20</b>

8"x8"x16" SOLID  
CONCRETE BLOCK  
CENTER W/RISER  
WALL (4 EACH)

EXISTING SANITARY  
SEWER PIPE

SEE SPECS FOR  
FOUNDATION  
IMPROVEMENT  
WHEN NEEDED



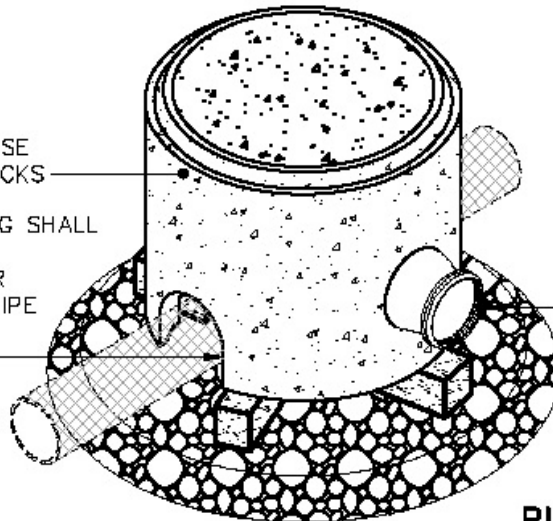
MIN. 8" CLEAR  
BETWEEN EXISTING  
PIPE AND PROPOSED  
STONE

12" THICK VDOT  
No. 57 STONE

**BASE ISOMETRIC VIEW**

SET DOGHOUSE BASE  
ON CONCRETE BLOCKS

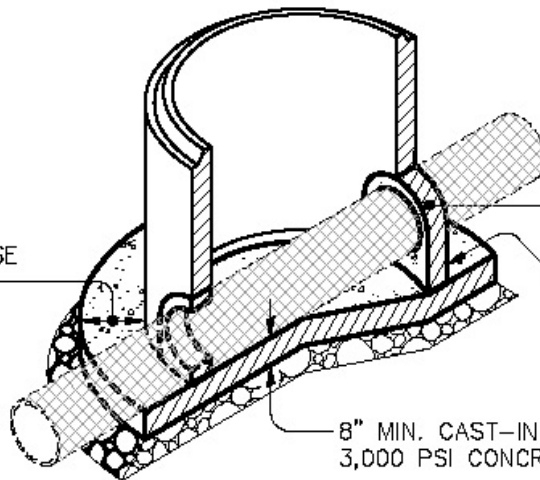
DOGHOUSE OPENING SHALL  
BE PREFORMED BY  
MANUFACTURER OR  
SAW CUT TO FIT PIPE  
OUTSIDE DIAMETER  
PLUS 6".



SEE PLANS FOR  
PROPOSED INVERT(S)  
LOCATION & ELEVATION

**RISER ISOMETRIC VIEW**

ALLOW CONCRETE  
TO FLOW A MIN.  
1'-0" BEYOND BASE  
OF STRUCTURE




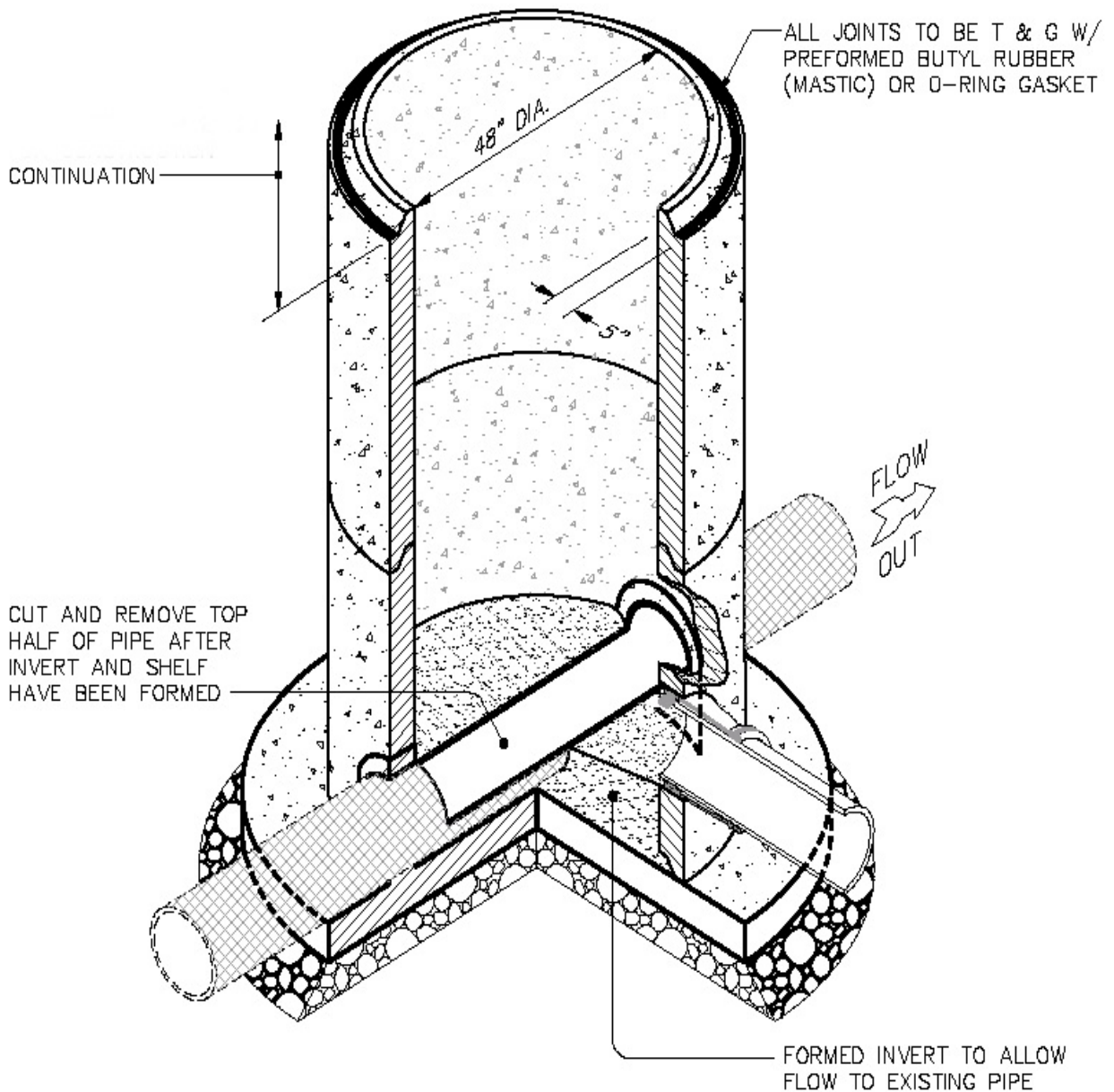
FILL DOGHOUSE OPENING  
AROUND EXISTING PIPE  
WITH 3,000 PSI CONCRETE

CONTRACTOR TO APPLY  
WATER PROOFING  
SEALANT AT JOINT (TYP.)

8" MIN. CAST-IN PLACE  
3,000 PSI CONCRETE BASE

**FOUNDATION SECTION VIEW**


Operations Division	<b>DOGHOUSE MANHOLE DETAIL (FOUNDATION)</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 21</b>



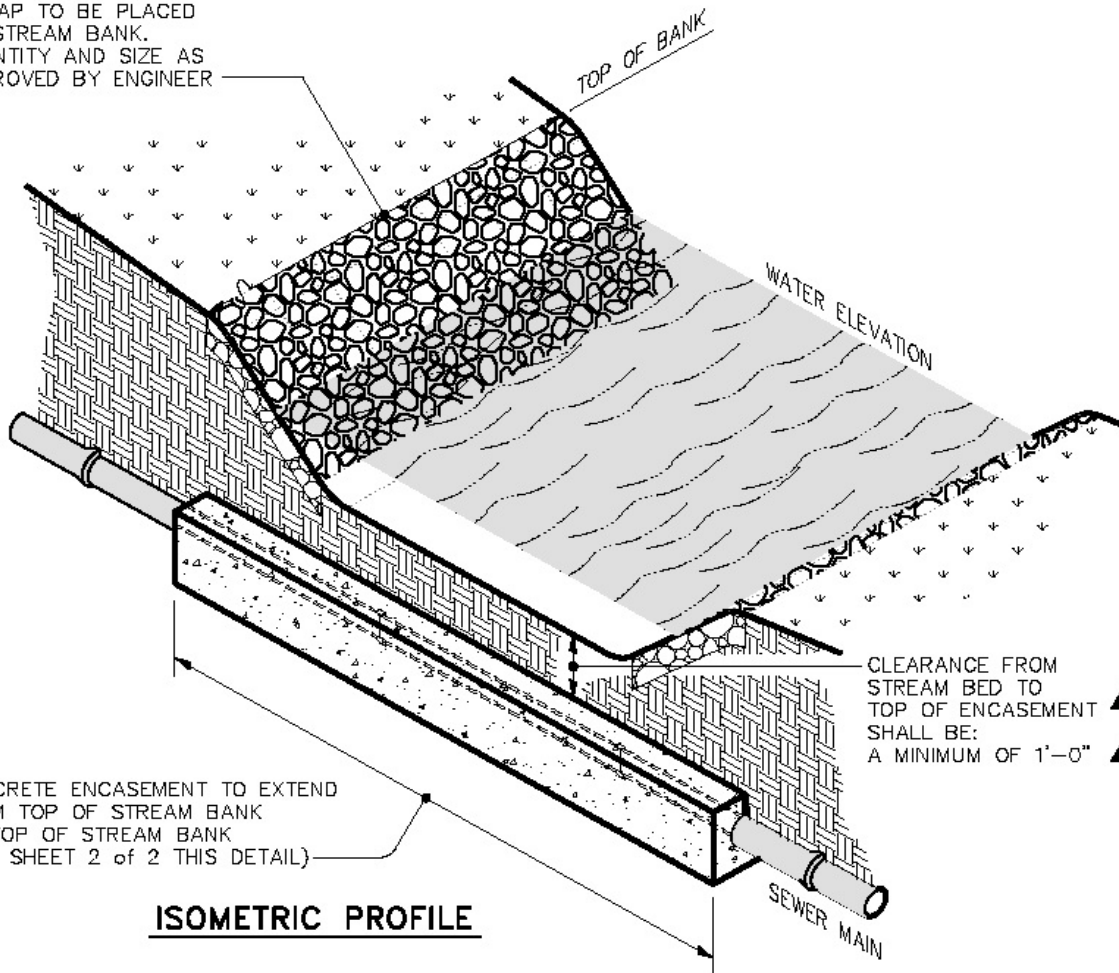
## INVERT SECTION VIEW

### NOTES:

- ALL SERVICE LATERALS ENTERING MANHOLE MUST BE CORE DRILLED AND BOOTED
- MAXIMUM DEPTH OF 4' MANHOLE = 20'

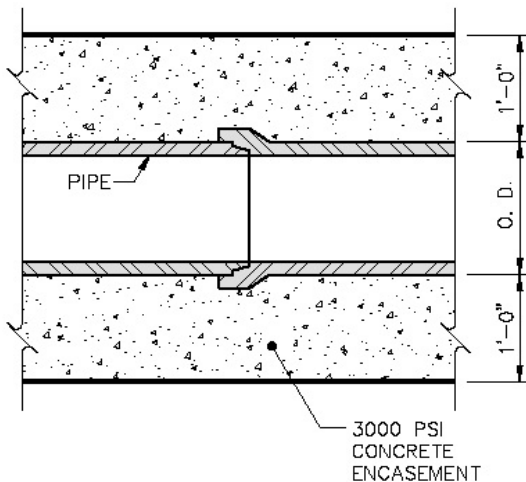
Operations Division	<b>DOGHOUSE MANHOLE DETAIL (INVERT)</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 22</b>

RIPRAP TO BE PLACED ON STREAM BANK. QUANTITY AND SIZE AS APPROVED BY ENGINEER

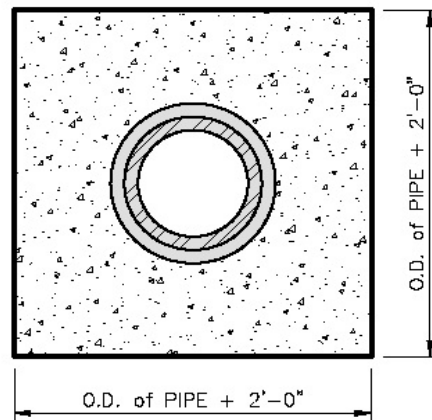


**ISOMETRIC PROFILE**


**NOTE: PIPE TO BE DUCTILE IRON AND CONCRETE TO BE 3000 PSI.**



**LONGITUDINAL SECTION**

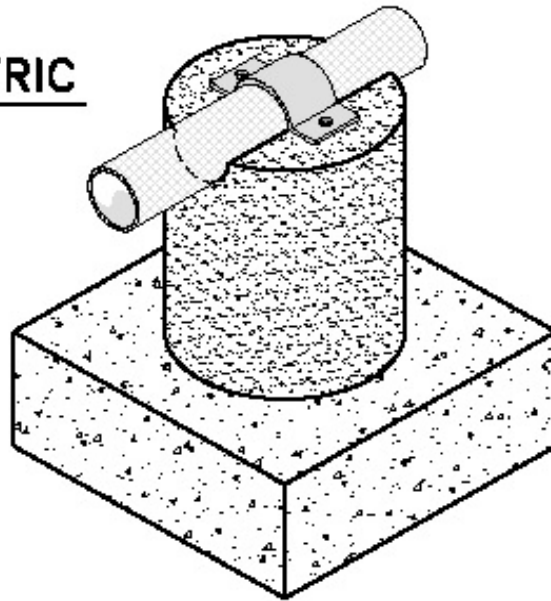


**TRANSVERSE SECTION**


Operations Division	<b>SEWER LINE UNDER STREAM BED CROSSING</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 23</b>

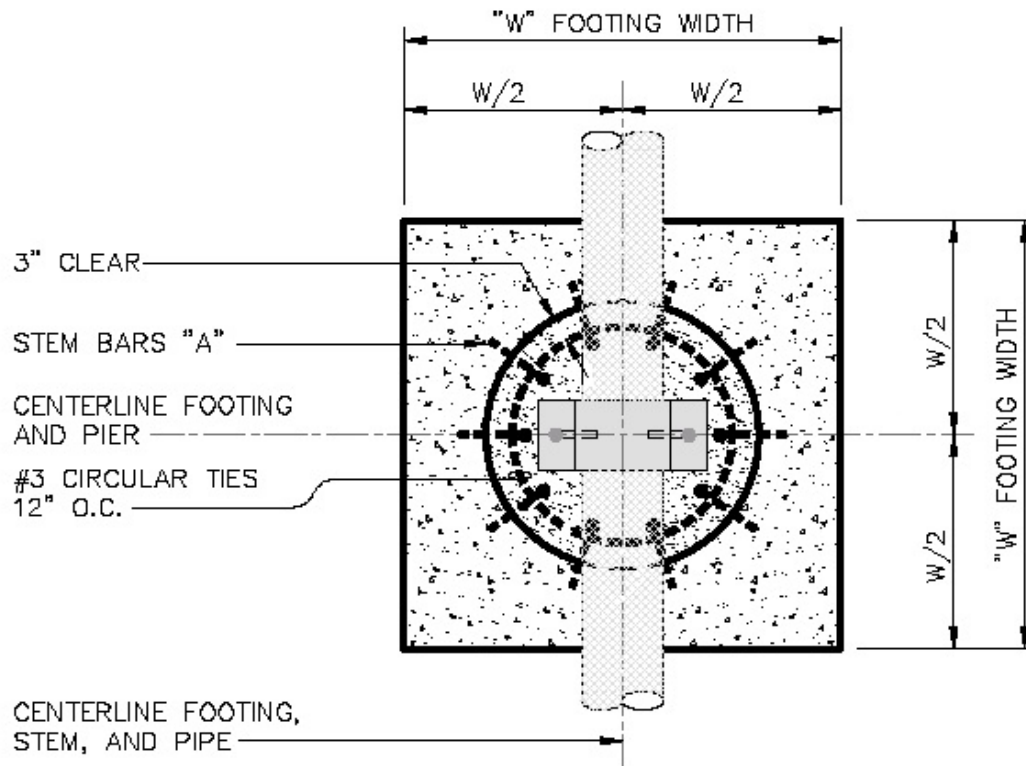


# ISOMETRIC

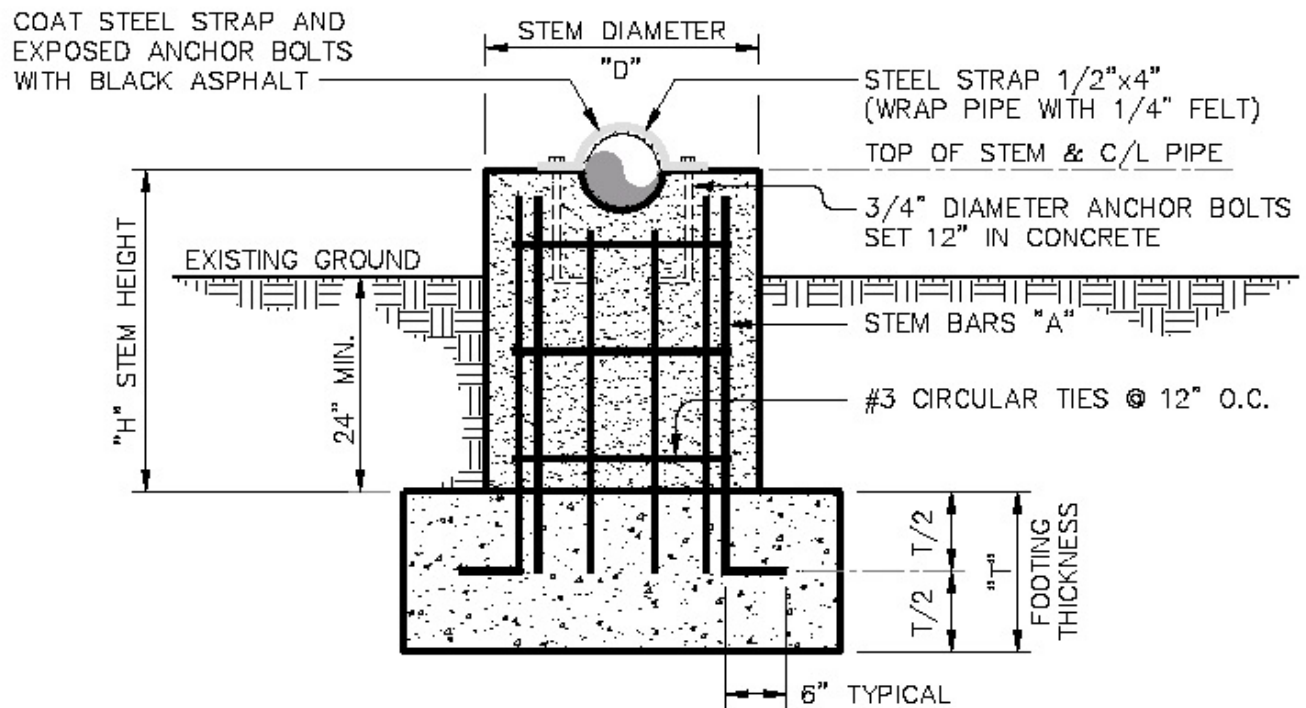


PIPE SUPPORT PIER FOR DRY LAND CROSSING									
PIPE DIAMETER	STEM DIAMETER "D"	STEM HEIGHT "H"	STEM REINF. BARS "A"	FOOTING SIZE		STEM CONC. VOL. / VERT. FT. CU. YARDS	STEM STEEL WT. / VERT. FT. POUNDS	FOOTING CONC. VOL. CU. YARDS	
				"W"	"T"				
8" TO 10"	2-6"	1'-3"	10#4	4'-0"	1'-6"	0.18	6.68	0.89	
		4'-6"	10#5	5'-0"	2'-0"				10.43
		7'-9"	10#5	6'-0"	2'-0"				10.43
		10'-12"	10#6	7'-0"	2'-6"				15.02
12" TO 16"	3'-0"	1'-3"	10#4	5'-0"	1'-6"	0.26	6.68	1.39	
		4'-6"	10#5	6'-0"	2'-0"				10.43
		7'-9"	10#6	7'-0"	2'-6"				15.02
		10'-12"	10#8	8'-0"	2'-6"				26.70
18" TO 24"	3'-6"	1'-3"	14#5	6'-0"	2'-0"	0.36	14.60	2.67	
		4'-6"	14#6	7'-0"	2'-6"				21.03
		7'-9"	14#6	8'-0"	3'-0"				21.03
		10'-12"	14#8	9'-0"	3'-0"				37.38


Operations Division	<b>ISO PIPE SUPPORT PIER FOR DRY LAND CROSSING</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 23</b>

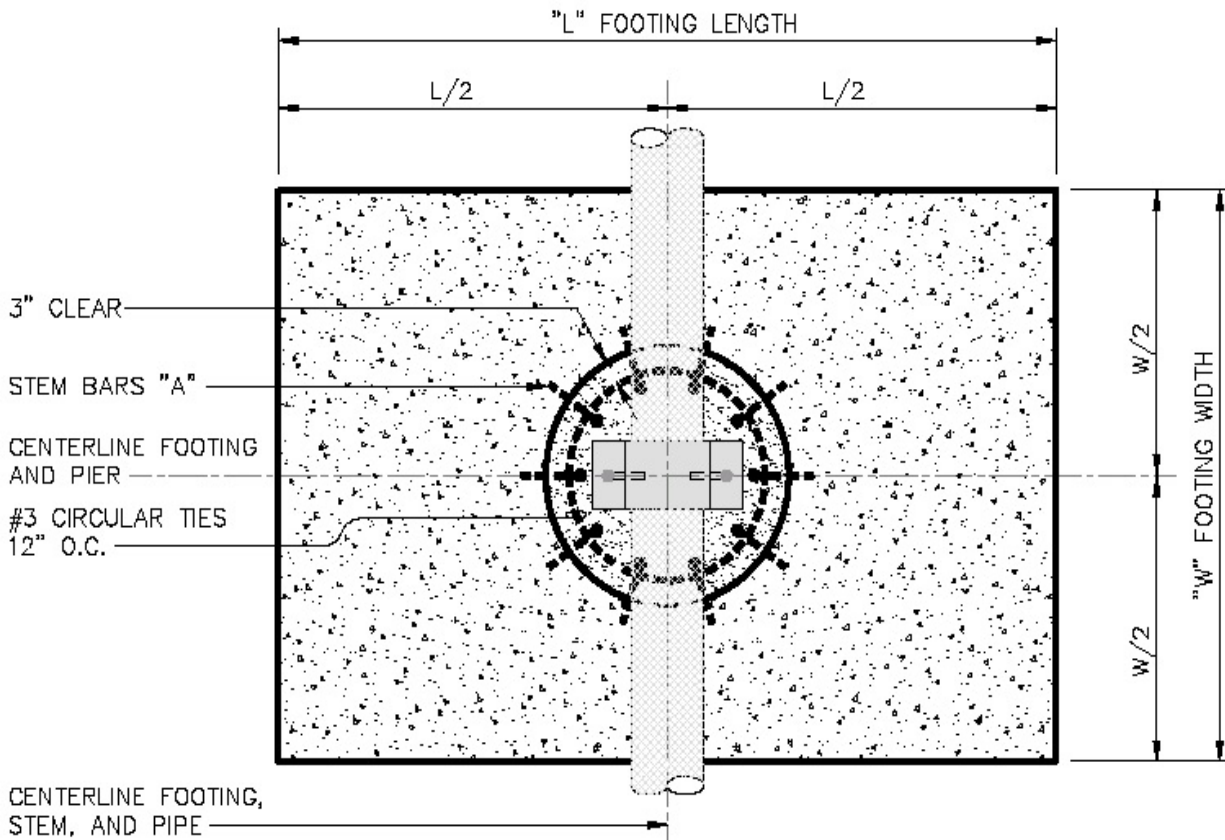


**PLAN**

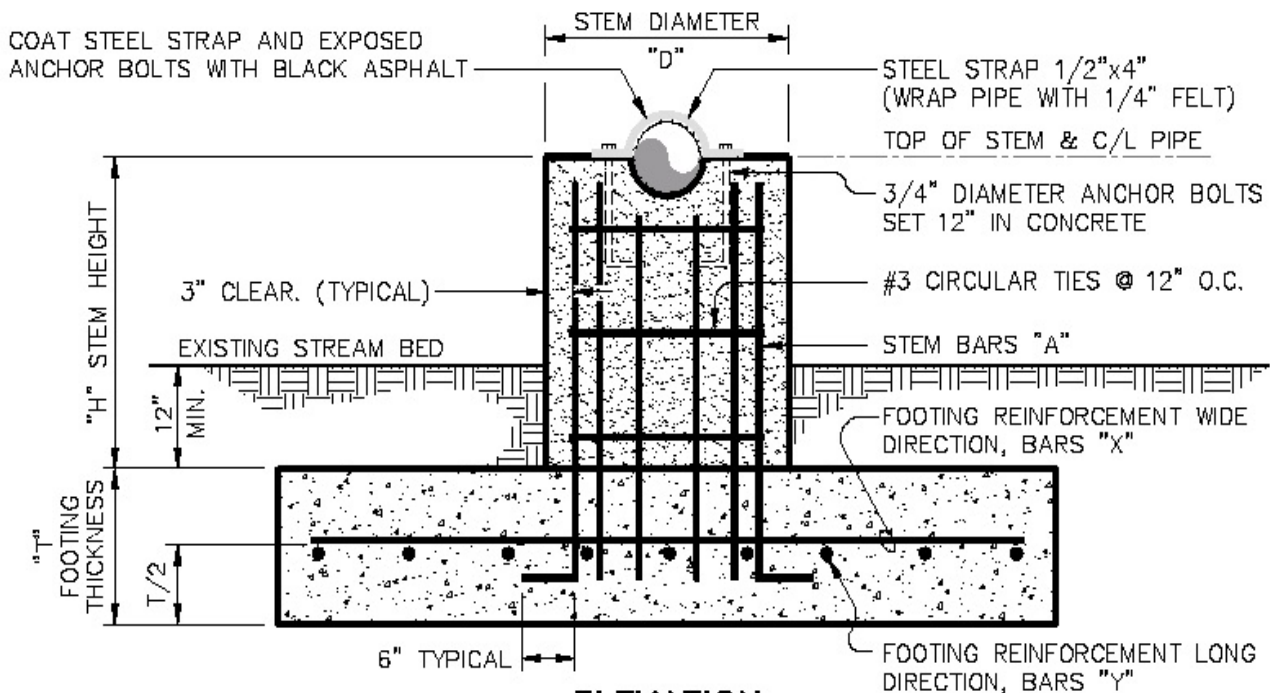


**ELEVATION**


Operations Division	<b>PIPE SUPPORT PIER FOR DRY LAND CROSSING</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 25</b>



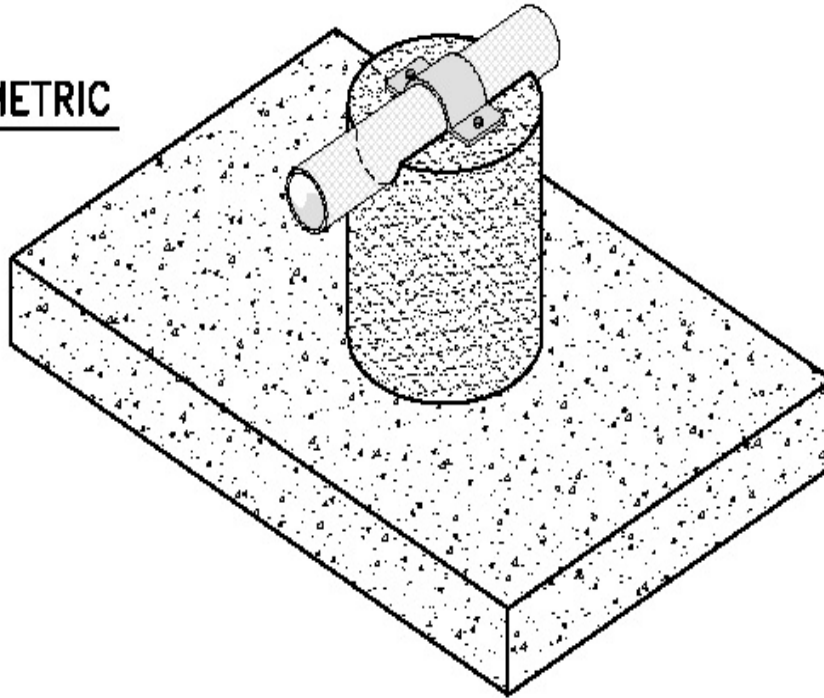
**PLAN**



**ELEVATION**

Operations Division	<b>PIPE SUPPORT PIER FOR OVER WATER CROSSING</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 27</b>

# ISOMETRIC



PIPE SUPPORT PIER FOR WATER CROSSING

PIPE DIAMETER	STEM DIAMETER "D"	STEM HEIGHT "H"	STEM REINF. BARS "A"	FOOTING SIZE			FOOTING REINF. BARS "X" (L)	FOOTING REINF. BARS "Y" (W)	STEM CONC. VOL. / VERT. FT. CU. YARDS	STEM STEEL WT. / VERT. FT. LBS.	FOOTING CONC. VOL. CU. YARDS	FOOTING STEEL WT. / VERT. FT. LBS.
				"L"	"T"	"W"						
8" TO 10"	2-6"	1'-3"	10#4	8'-0"	2'-0"	5'-6"	6#5	9#4	0.18	9.04	3.26	77.0
		4'-6"	10#5	10'-0"	2'-6"	5'-0"	6#5	11#4				
		7'-9"	10#5	11'-0"	2'-8"	6'-0"	7#6	12#5				
		10'-12'	10#6	12'-0"	3'-0"	7'-0"	8#6	13#5				
12" TO 16"	3'-0"	1'-3"	10#4	10'-0"	2'-6"	5'-0"	6#5	11#4	0.26	9.63	4.63	92.5
		4'-6"	10#5	12'-0"	2'-8"	5'-0"	6#6	13#5				
		7'-9"	10#6	13'-0"	3'-0"	6'-0"	7#7	14#5				
		10'-12'	10#8	14'-0"	3'-0"	6'-0"	7#8	15#6				
18" TO 20"	3'-6"	1'-3"	14#5	11'-0"	2'-6"	5'-0"	6#5	12#5	0.36	18.14	5.09	122.0
		4'-6"	14#6	12'-0"	3'-0"	6'-0"	7#6	13#5				
		7'-9"	14#6	14'-0"	3'-0"	6'-0"	7#7	15#6				
		10'-12'	14#8	15'-0"	3'-6"	6'-0"	7#8	16#6				
24"	3'-6"	1'-3"	14#5	11'-0"	2'-6"	6'-0"	7#5	12#5	0.36	18.14	6.11	145.5
		4'-6"	14#6	13'-0"	3'-0"	6'-0"	7#6	14#6				
		7'-9"	14#6	14'-0"	3'-4"	7'-0"	8#7	15#6				
		10'-12'	14#8	15'-0"	4'-0"	7'-0"	8#8	16#6				

Operations Division

## PIPE SUPPORT PIER FOR OVER WATER CROSSING



Adopted : 01/13/2008

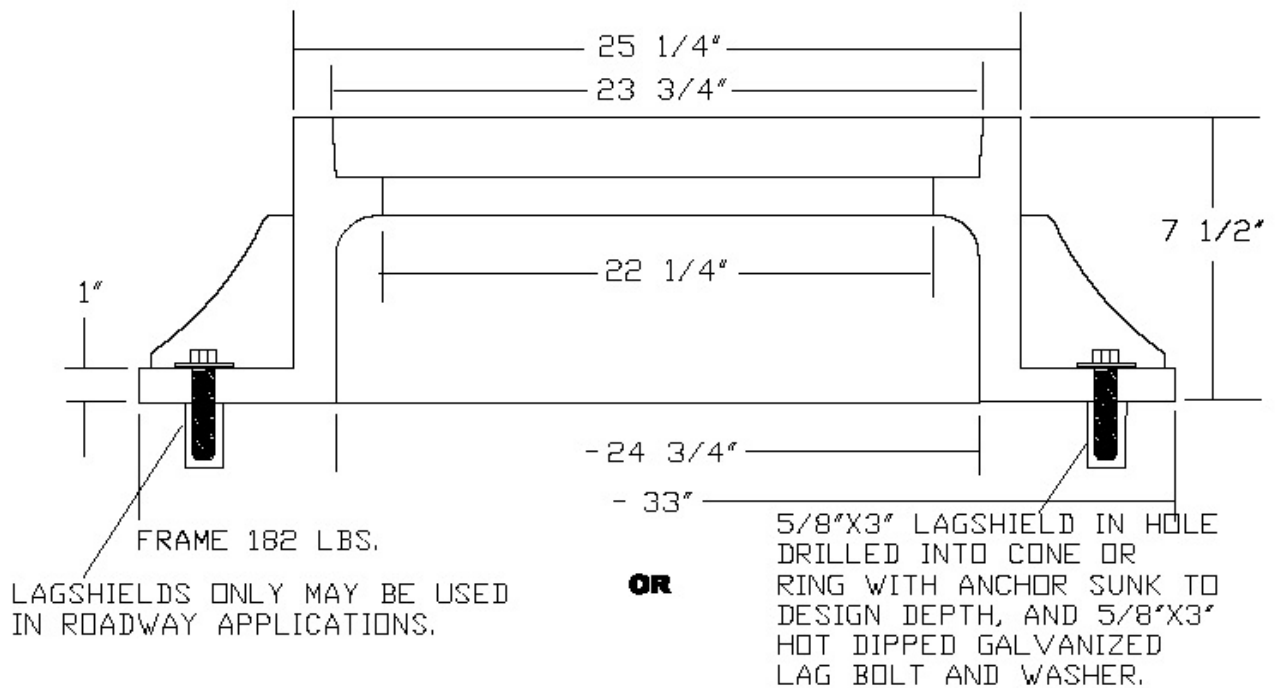
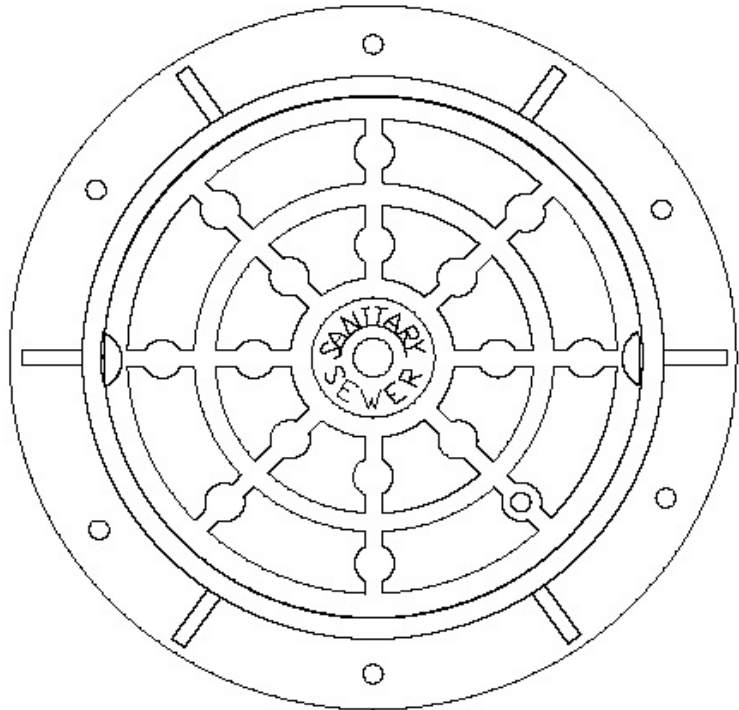
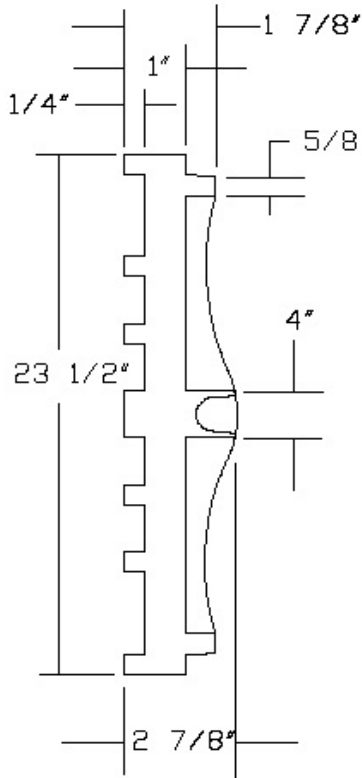
Approved:


Revised:

Detail Number: **SEW - 26**

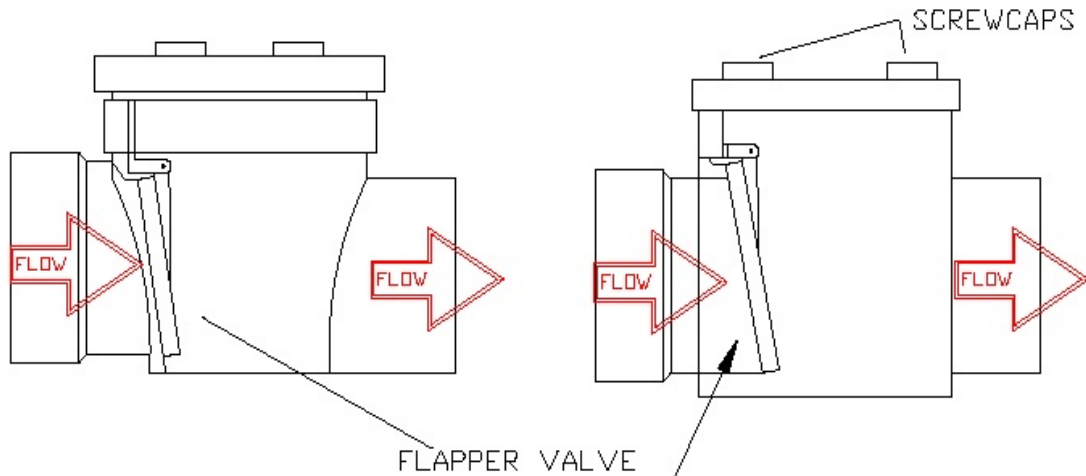
# MANHOLE FRAME AND COVER

COVER 120 LBS. MINIMUM

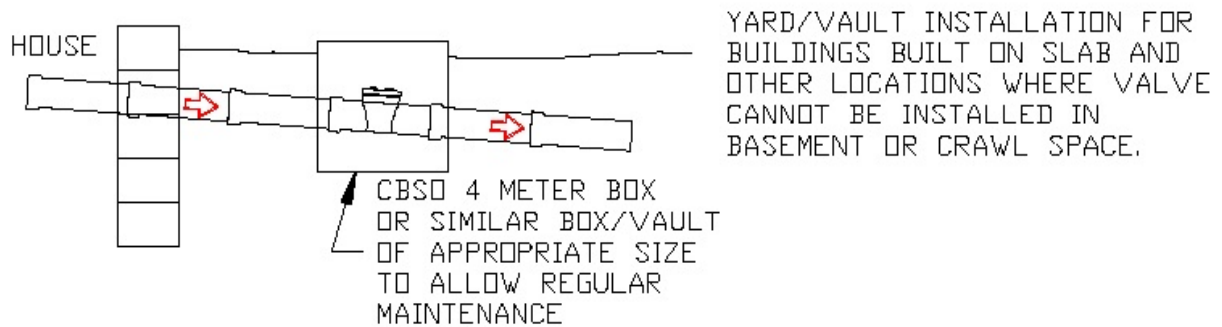
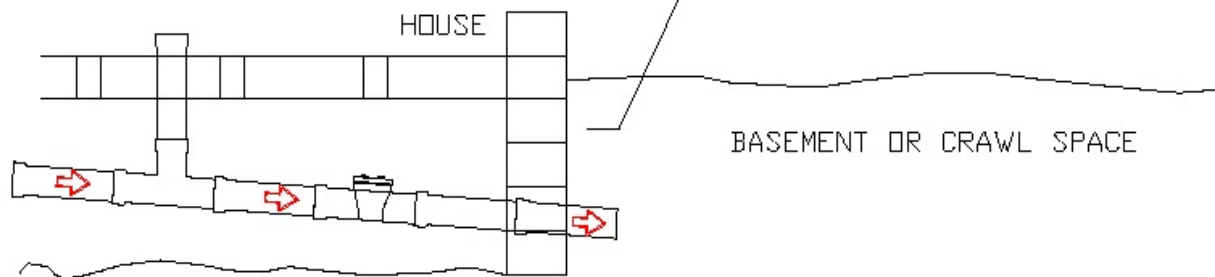


Operations Division	<b>STANDARD MANHOLE FRAME AND COVER</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 28</b>

TYPICAL SANITARY SEWER SERVICE BACKWATER VALVE STYLES:




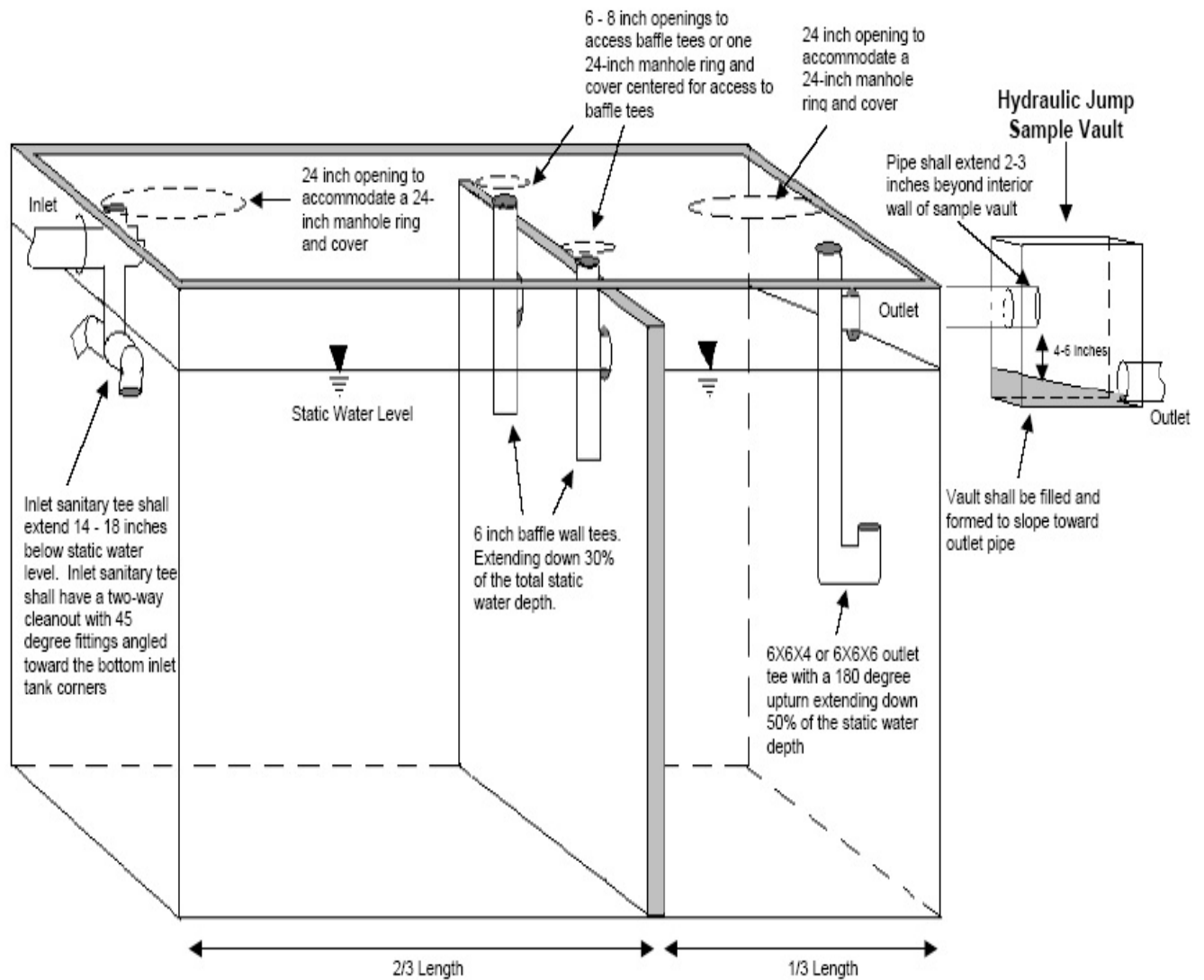
TYPICAL BACKWATER VALVE INSTALLATIONS:




NOTES:

1. INSTALLATIONS OF GREATER THAN 4' IN DEPTH MAY REQUIRE MANHOLE.
2. VALVES MUST BE INSTALLED IN A LOCATION AT WHICH THEY CAN BE CLEANED AND SERVICED REGULARLY.

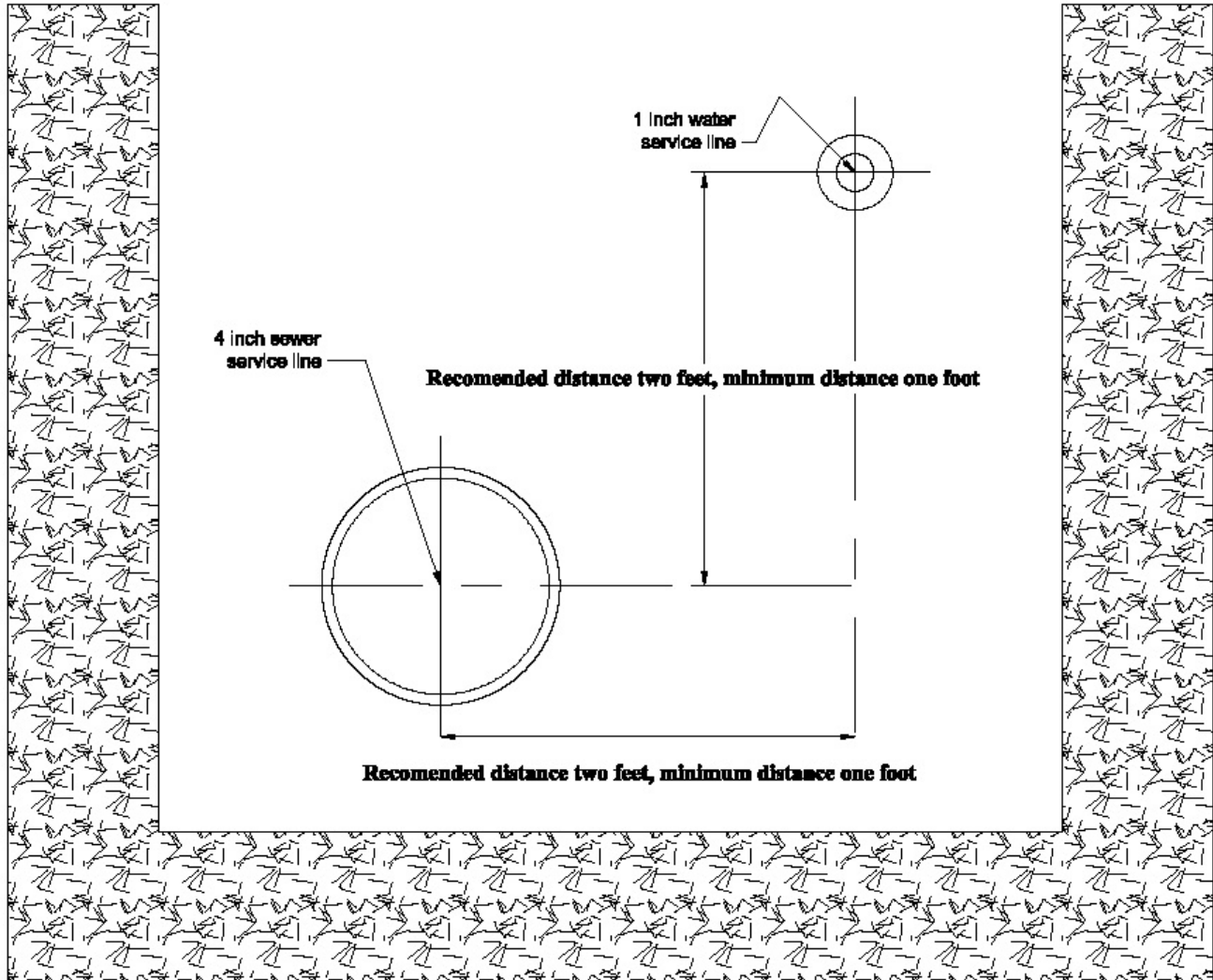
Operations Division	<b>SANITARY SEWER BACKWATER VALVE</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 29</b>




INTERCEPTOR SHALL BE SIZED IN ACCORDANCE WITH CHAPTER 10 "TRAPS, INTERCEPTORS AND SEPARATORS" OF THE INTERNATIONAL PLUMBING CODE (IPC).

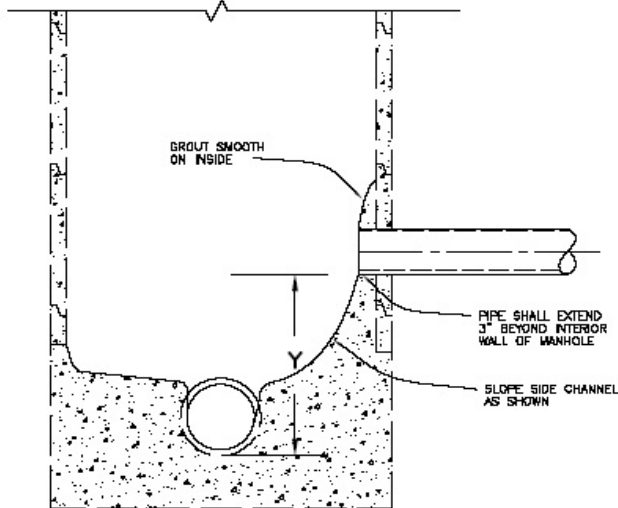
Operations Division	<b>TYPICAL GREASE INTERCEPTOR DETAIL</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 03</b>

This Drawing depicts a common trench utility detail. When the water and sewer are in the same trench the water shall be a minimum of one foot above and one foot over from the sewer.



Operations Division	<b>RESIDENTIAL TRENCH WATER &amp; SEWER</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 30</b>





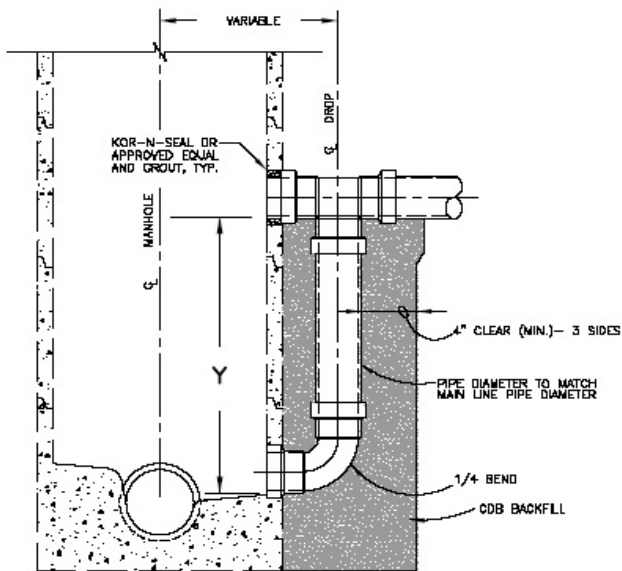
**TYPE 'A'**  
**MAX. "Y" DIMENSION = 24"**

**TABLE**

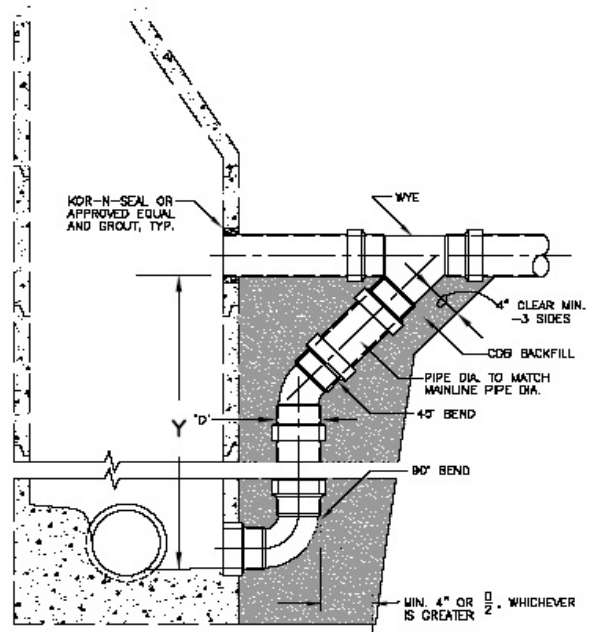
INLET PIPE SIZE	8"	10"	12"	15"
TYPE 'A'	24" OR LESS	24" OR LESS	24" OR LESS	24" OR LESS
TYPE 'B'	24" AND GREATER	31" AND GREATER	35" AND GREATER	42" AND GREATER
TYPE 'C'	30" AND GREATER	57" AND GREATER	65" AND GREATER	84" AND GREATER

**NOTES:**

1. SEE STANDARD PLAN 101 FOR ADDITIONAL MANHOLE DETAILS.
2. TYPE 'C' DROP MAY BE REQUIRED OVER TYPE 'B' IN LOCATIONS OF HIGH FLOW AND/OR STEEP GRADES.
3. ALL PIPE IS P.V.C.
4. CONSTRUCTION OF ADDITIONAL MANHOLE IS REQUIRED WHEN COMBINATION OF INLET PIPE SIZE AND "Y" DIMENSIONS ARE OUTSIDE PARAMETERS OF ABOVE TABLE.



**TYPE 'B'**



**TYPE 'C'**

Operations Division

**DROP INLET MANHOLE DETAILS**

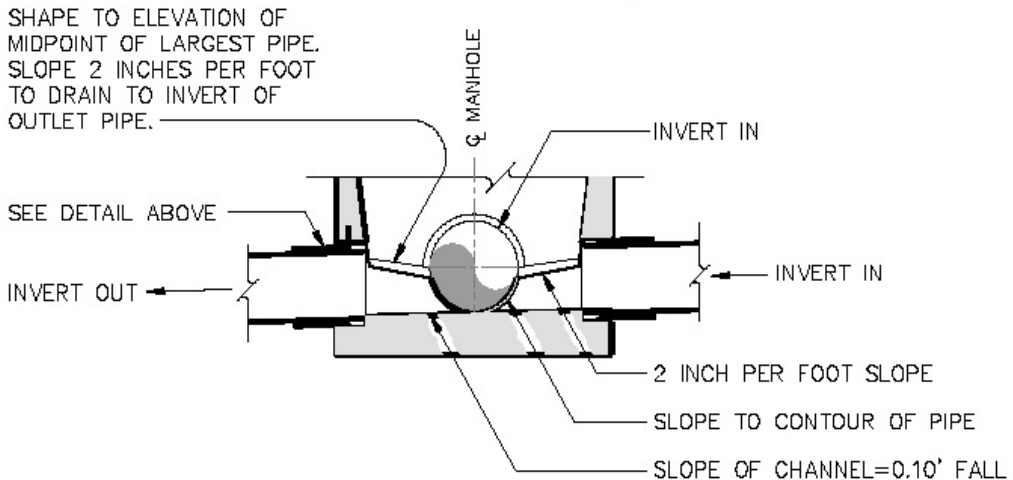
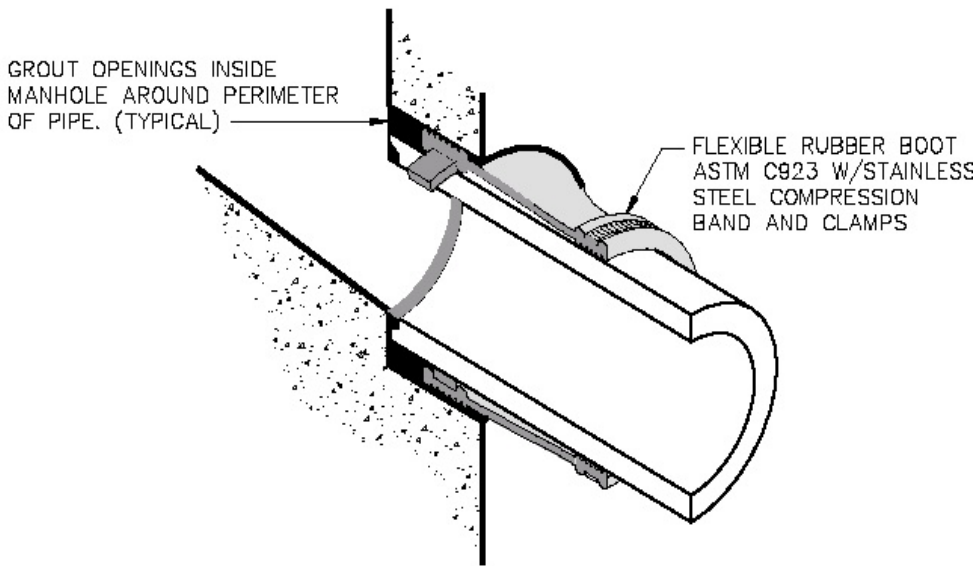


Adopted : 01/13/2008

Approved:

Revised:

Detail Number: **SEWER - 31**

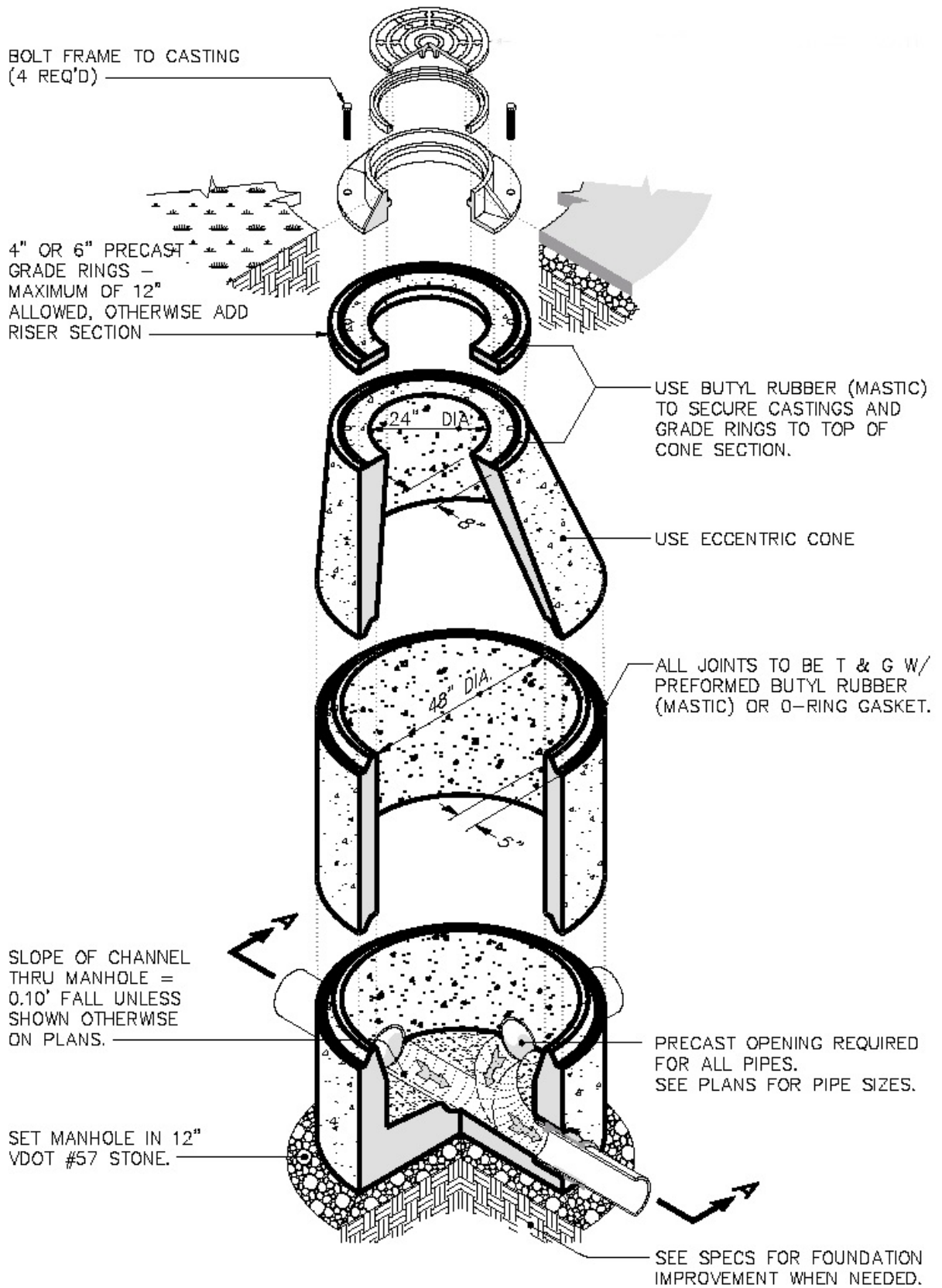



**SECTION A-A**

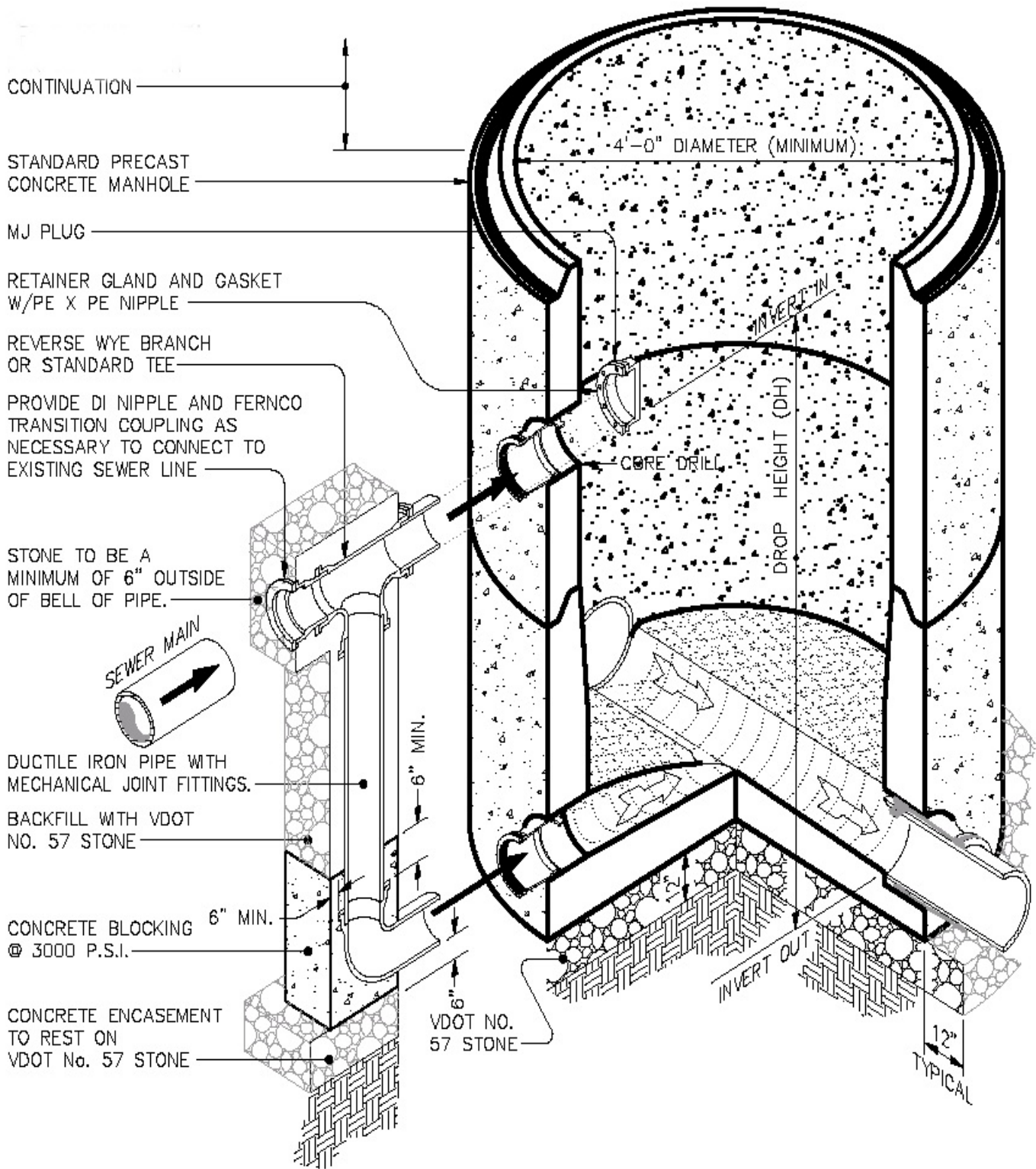
**NOTES:**


1. ALL SERVICE LATERALS INTO MANHOLE TO BE CORE DRILLED AND BOOTED.
2. MAXIMUM DEPTH 4' DIAMETER MANHOLE = 20' (SEE SEWER DESIGN SECTION FOR OTHER REQUIREMENTS / LIMITATIONS).
3. THE INVERT SHAPING AS SHOWN SHALL CONSIST OF 3,000 PSI CONCRETE TROWELLED TO A SMOOTH SURFACE WITH NO AGGREGATE EXPOSED.
4. DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE IS TO BE SHAPED INDIVIDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.
5. WHEN DIFFERENT DIAMETER PIPES ARE USED FROM INVERT IN TO INVERT OUT, PROVIDE A SMOOTH TRANSITION THROUGH THE INVERT.

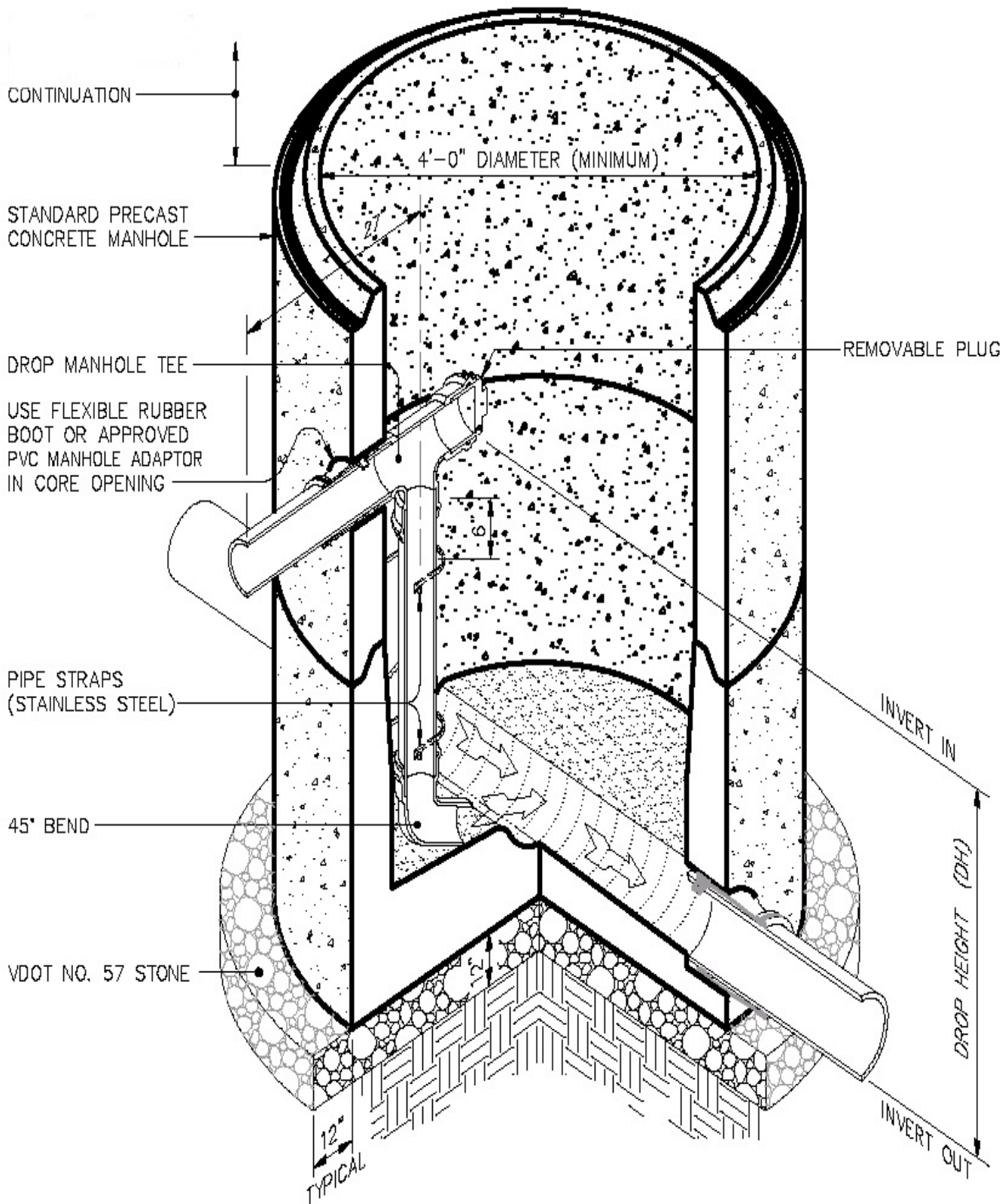
Operations Division	<b>4' PRECAST CONCRETE MANHOLE - STANDARD</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER -04</b>




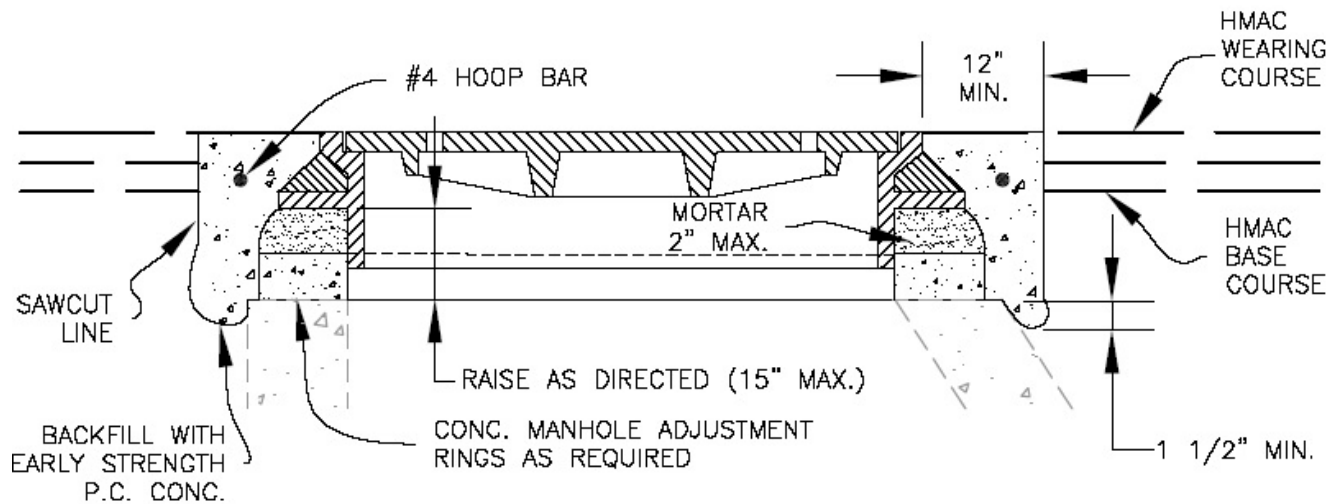
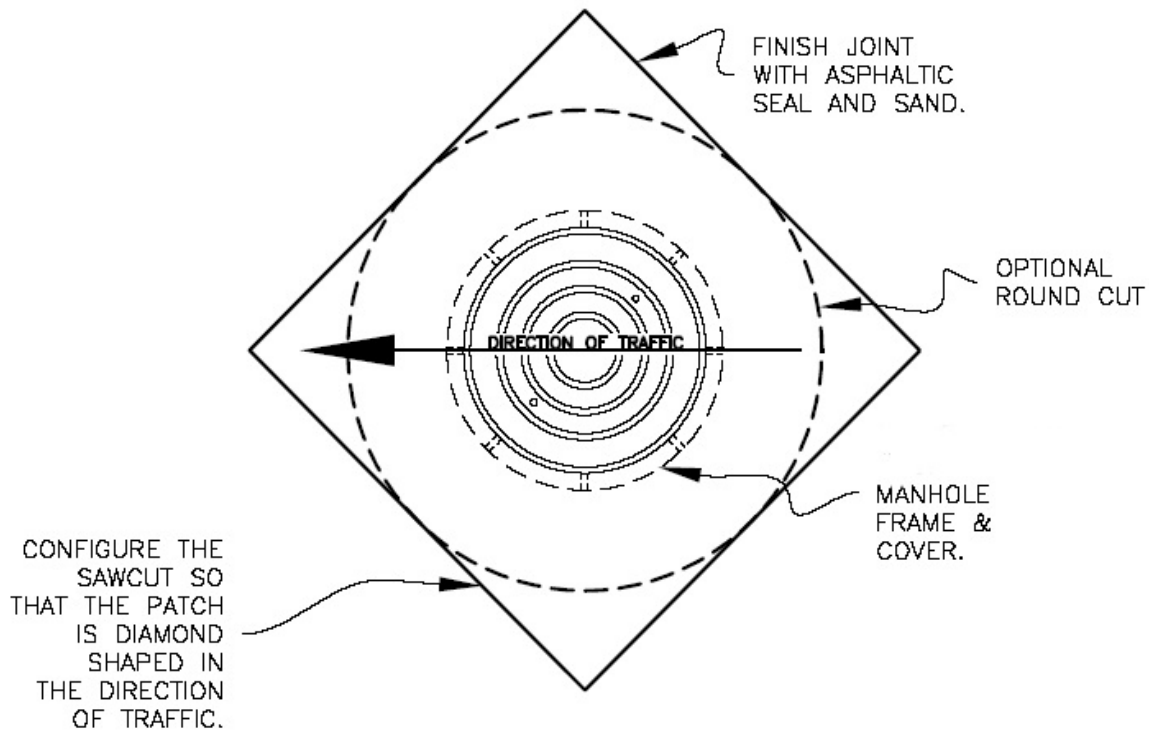
Operations Division	<b>4' PRECAST CONCRETE MANHOLE - STANDARD</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER -05</b>




Operations Division	<b>OUTSIDE - DROP MANHOLE DETAILS</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 06</b>

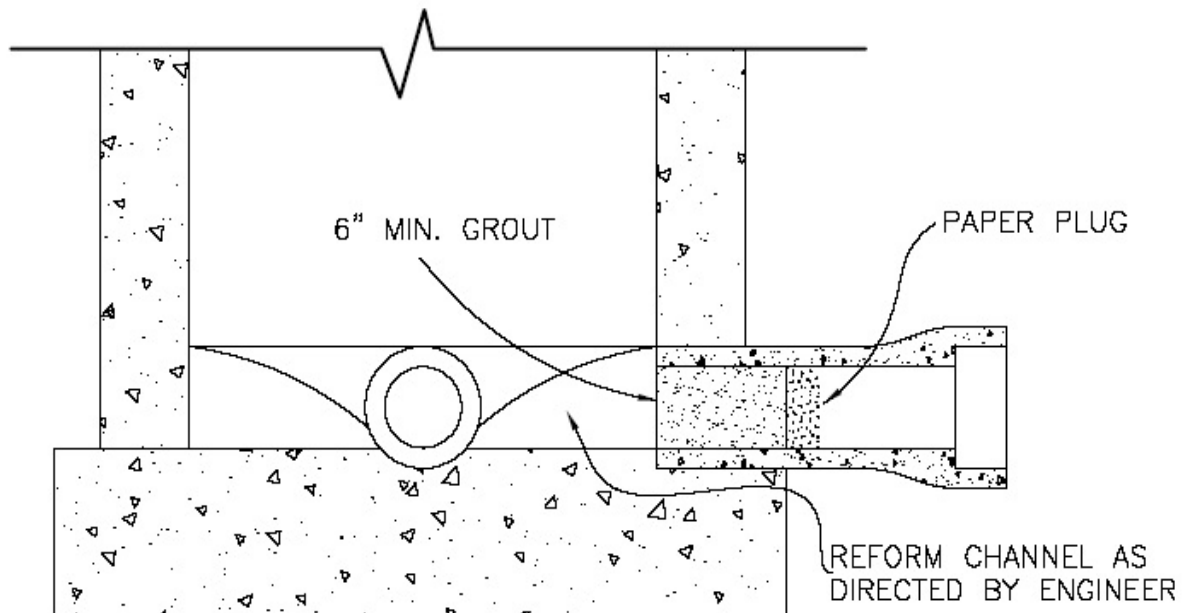
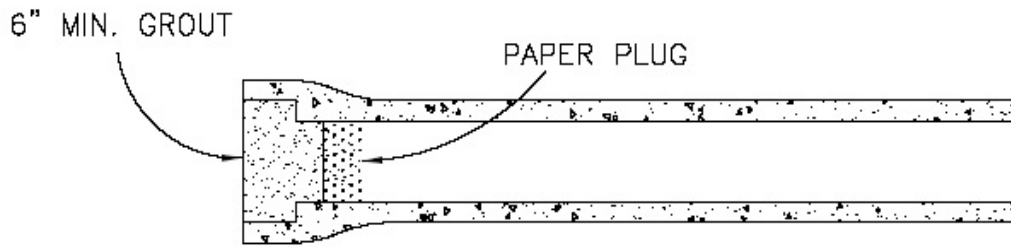


Operations Division	<b>INSIDE - DROP MANHOLE DETAILS</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 07</b>




1. COVER MANHOLE WITH BUILDING PAPER AND CONSTRUCT HMAC BASE AND WEARING COURSES.
2. SAWCUT SQUARE OR CIRCULAR EXCAVATION AROUND MANHOLE 12" MINIMUM FROM MANHOLE FRAME.
3. RAISE MANHOLE FRAME AND COVER TO FINISH GRADE BY INSTALLING CONCRETE RINGS AND LEVELING MORTAR.
4. BACKFILL WITH EARLY STRENGTH P.C.C. TO FINISH GRADE.

Operations Division	<b>MANHOLE ADJUSTMENT SEQUENCE</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 08</b>



NOTE:  
 THIS DRAWING DEPICTS CONCRETE PIPE.  
 USE MECHANICAL PLUGS WHEN ABANDONING PLASTIC PIPES.

Operations Division	<b>PLUGS FOR CONCRETE SEWER PIPE ABANDONMENT</b>	
	Adopted : 01/13/2008	Approved:
	Revised:	Detail Number: <b>SEWER - 09</b>