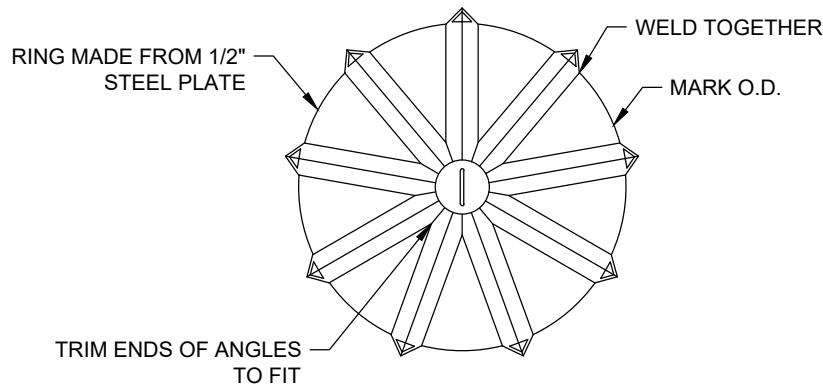
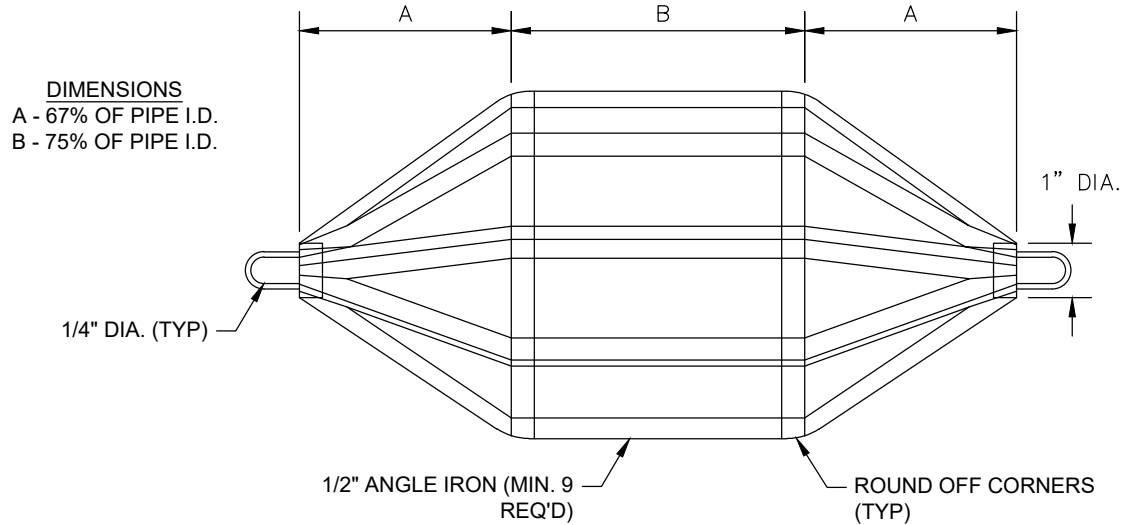


<div><div><div>PROPERTY OF</div><div>CRYSTAL CLEAR</div><div>Est. 1964</div><div>★ Special Utility District</div></div></div>	ABANDONED MANHOLE	<div><div><div><div></div><div>A</div></div></div><div><div>M&amp;S ENGINEERING</div><div>POWER &amp; UTILITY ENGINEERS</div><div>TXENG FIRM #F-1394   TBPULS FIRM #10169800</div><div>www.MSENGR.com   830-228-5446</div></div></div>	APPROVED	REVISION
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**END VIEW**



**SIDE OR TOP VIEW**

SIZE	A	B	MANDREL O.D.		RING O.D.	
			PVC (SDR-35)	PVC (SDR-26)	PVC (SDR-35)	PVC (SDR-26)
6"	4.0"	4.5"	5.62	5.50	4.91	4.79
8"	5.5"	6"	7.52	7.37	6.81	6.66
10"	7.0"	7.5"	9.41	9.21	8.70	8.50
12"	8.0"	9"	11.19	10.96	10.48	10.25
15"	10.0"	11"	13.70	13.42	12.99	12.71
18"	12.0"	13.5"	16.75	-	16.04	-
21"	14.0"	16"	19.74	-	19.03	-
24"	16.0"	18"	22.21	-	21.50	-
27"	18.0"	20"	25.03	-	24.32	-

\*MINIMUM LENGTH

**CHART**

**MANDREL REQUIREMENTS:**

1. O.D. NOT LESS THAN 95% OF THE I.D. OF THE PIPE, AS SPECIFIED BY THE ASTM, AWWA, UNI-BELL OR ANSI.
2. ABLE TO WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
3. ODD NUMBER OF RUNNERS OR LEGS.

\*THIS INFORMATION IS PROVIDED AS A REFERENCE. ALL DEFLECTION TESTING SHALL BE DONE IN ACCORDANCE WITH TCEQ CHAPTER 217.



DEFLECTION TESTING  
MANDREL



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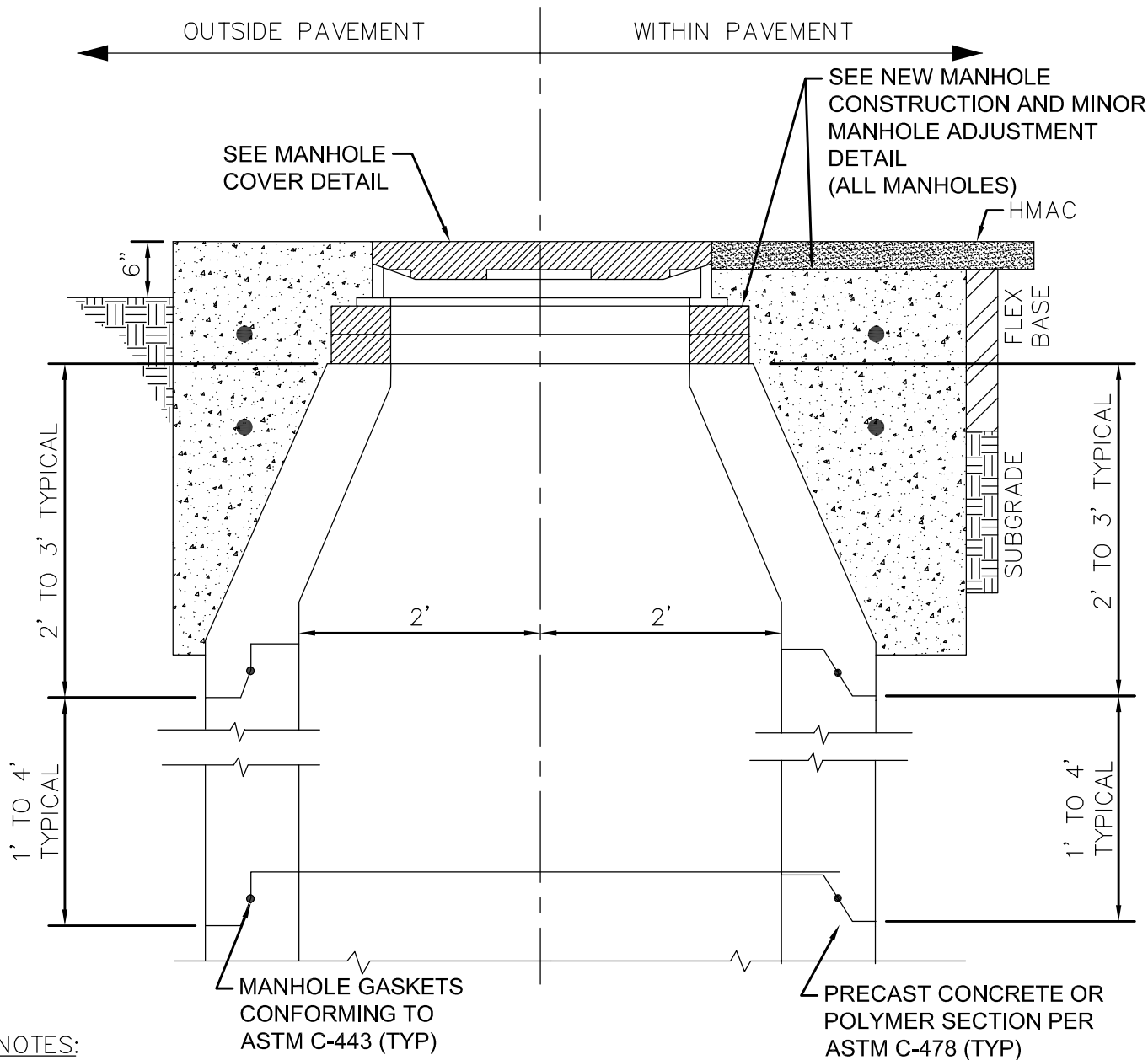
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**NOTES:**

1. MANHOLE SECTIONS TEMPORARILY REMOVED FOR ROADWAY CONSTRUCTION MAY BE REUSED ONLY WITH THE WRITTEN APPROVAL OF THE INSPECTOR. GASKETS SHALL NOT BE REUSED.
2. ANY COMBINATION OF REMOVING THE CONCRETE RINGS, AND / OR THE MANHOLE CONE, AND/OR THE STRAIGHT RISER SECTION OF THE MANHOLE SHALL BE ACCEPTABLE TO TEMPORARILY LOWER THE MANHOLE GRADE FOR ROADWAY RECONSTRUCTION.
3. WHILE THE MANHOLE IS TEMPORARILY LOWERED, A SHEET OF STEEL SUITABLE TO SUPPORT ALL IMPOSED LOADS SHALL BE USED TO COVER THE OPENING. THE STEEL PLATE SHALL BE SET IN MORTAR TO PREVENT LEAKAGE.
4. SUBGRADE AND BASE MATERIALS SHALL BE COMPACTED TO 95% AND 100% DENSITIES, RESPECTIVELY, COMPACTION SHALL BE BY MECHANICAL TAMPING TO THE DENSITIES SPECIFIED.
5. MANHOLE SHALL BE SET SO RING AND COVER MATCH STREET SLOPE.



MAJOR MANHOLE  
ADJUSTMENT



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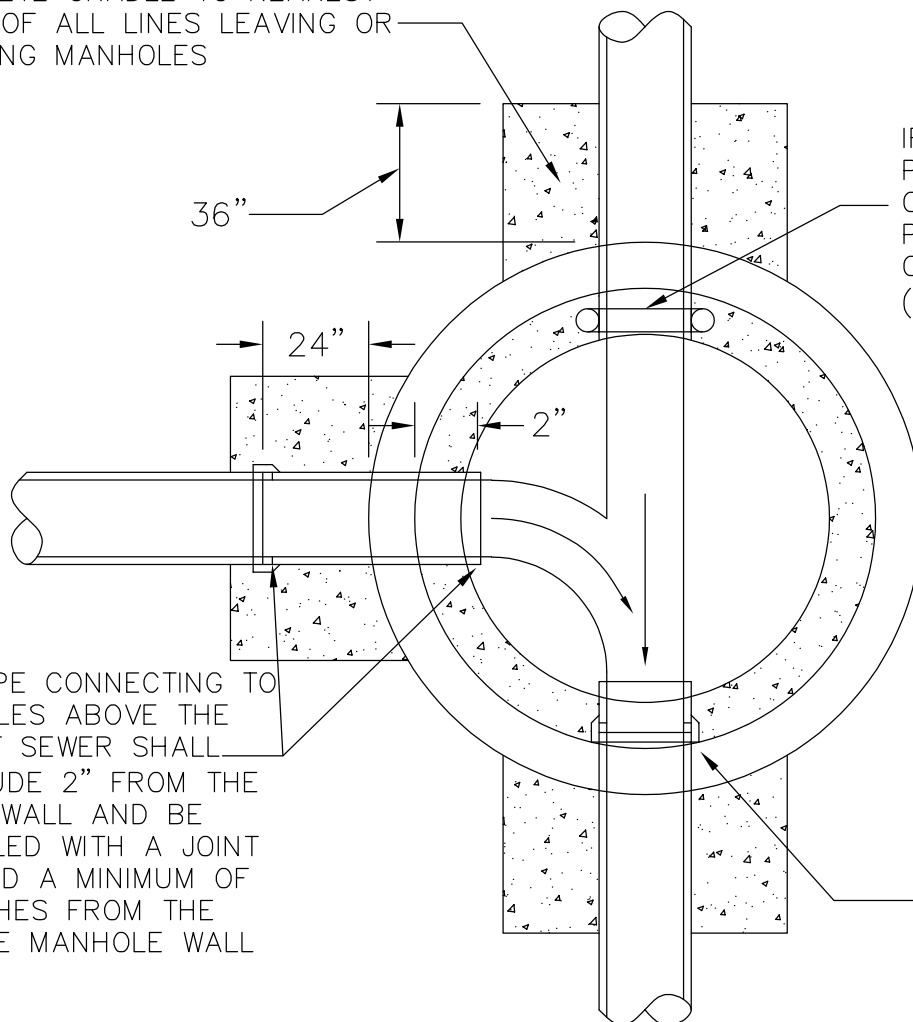
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CONCRETE CRADLE TO NEAREST  
 POINT OF ALL LINES LEAVING OR  
 ENTERING MANHOLES



IF PVC PIPE IS USED,  
 PROVIDE RUBBER GASKETS  
 ONE SIZE SMALLER THAN  
 PIPE AT EACH WALL  
 CROSSING OF MANHOLE  
 (ASTM C923)

THE PIPE CONNECTING TO  
 MANHOLES ABOVE THE  
 LOWEST SEWER SHALL  
 PROTRUDE 2" FROM THE  
 INSIDE WALL AND BE  
 INSTALLED WITH A JOINT  
 LOCATED A MINIMUM OF  
 24 INCHES FROM THE  
 OUTSIDE MANHOLE WALL

NO JOINTS FOR PIPE  
 WILL BE ALLOWED  
 WITHIN WALL SECTION

## MANHOLE FLOOR PLAN

### NOTES:

1. THE MINIMUM ANGLE OF FLOW FROM A CONNECTING SEWER TO THE DIRECTION OF FLOW IS 90 DEGREES.



STANDARD MANHOLE  
 FLOOR PLAN



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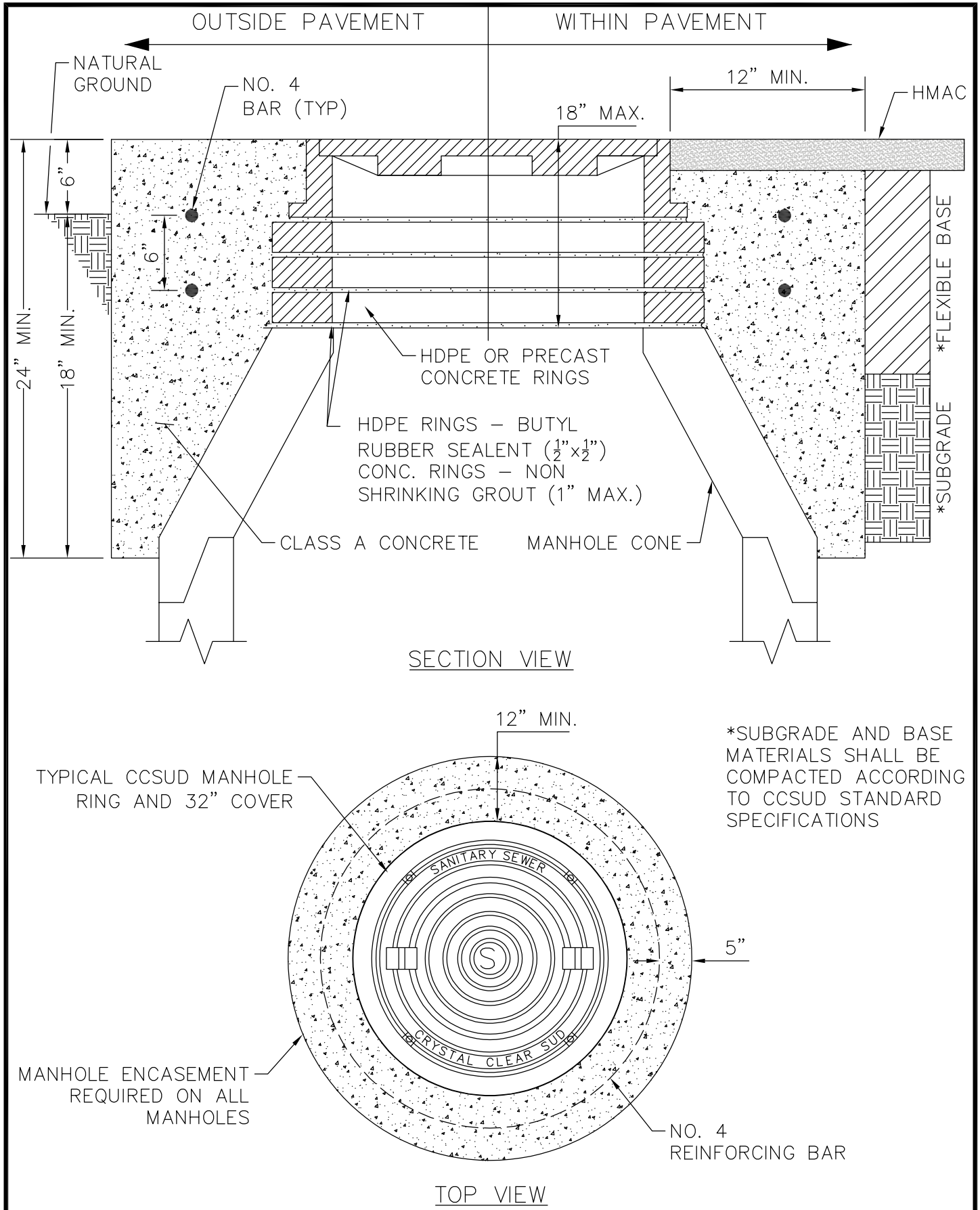
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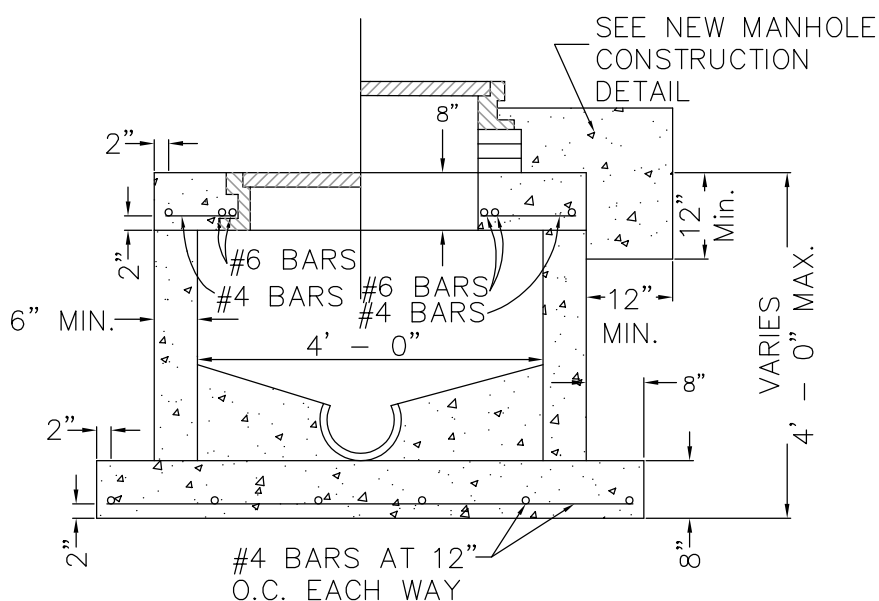
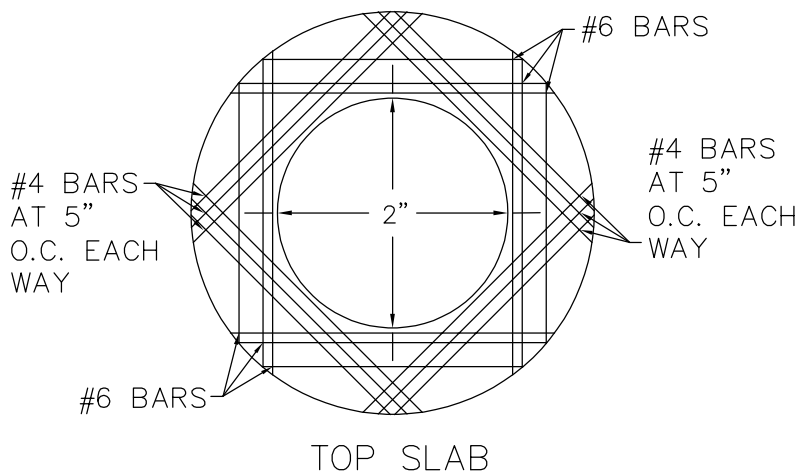
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SHALLOW MANHOLE  
PRECAST OR MONOLITHIC

NOTE:

1. PVC PIPES AND FITTINGS SIX (6") TO FIFTEEN INCHES (15") IN DIAMETER SHALL CONFORM TO ASTM D3034
2. PVC PIPES AND FITTINGS EIGHTEEN INCHES (18") TO TWENTY-SEVEN INCHES (27") IN DIAMETER SHALL CONFORM TO ASTM F679.
3. THIS INFORMATION IS PROVIDED AS A REFERENCE. ALL DEFLECTION TESTING SHALL BE DONE IN ACCORDANCE WITH TCEQ CHAPTER 317.



SHALLOW MANHOLE:  
PRECAST OR MONOLITHIC,  
TOP SLAB & CHART



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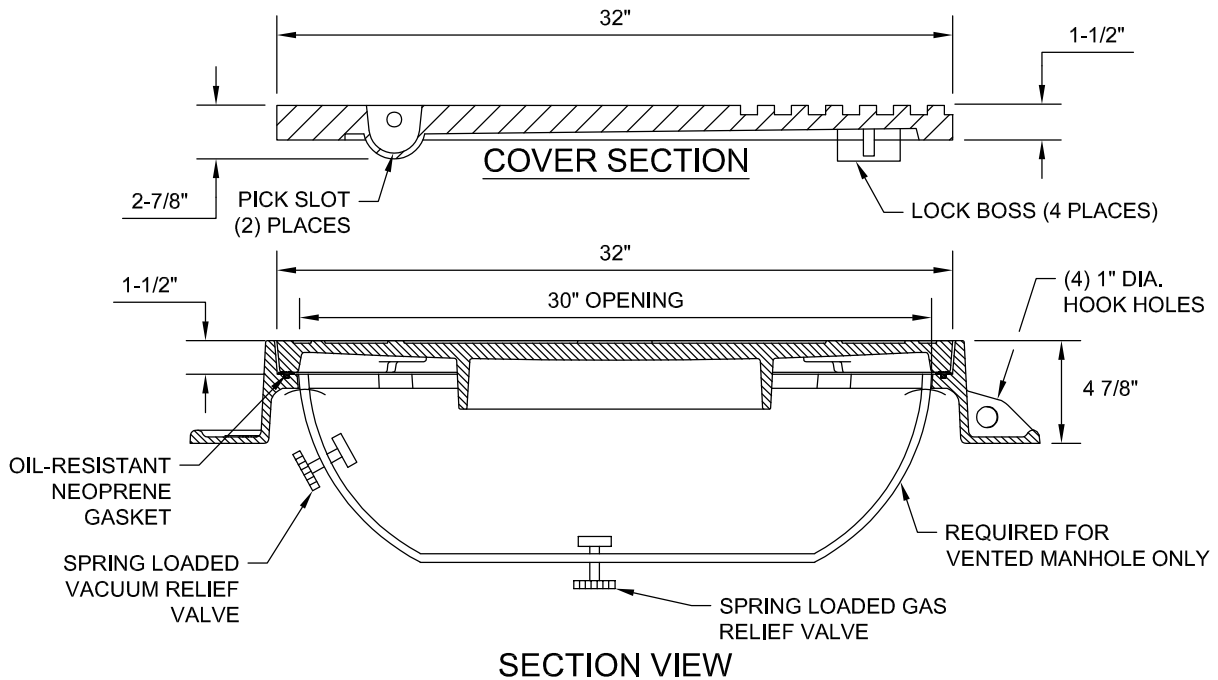
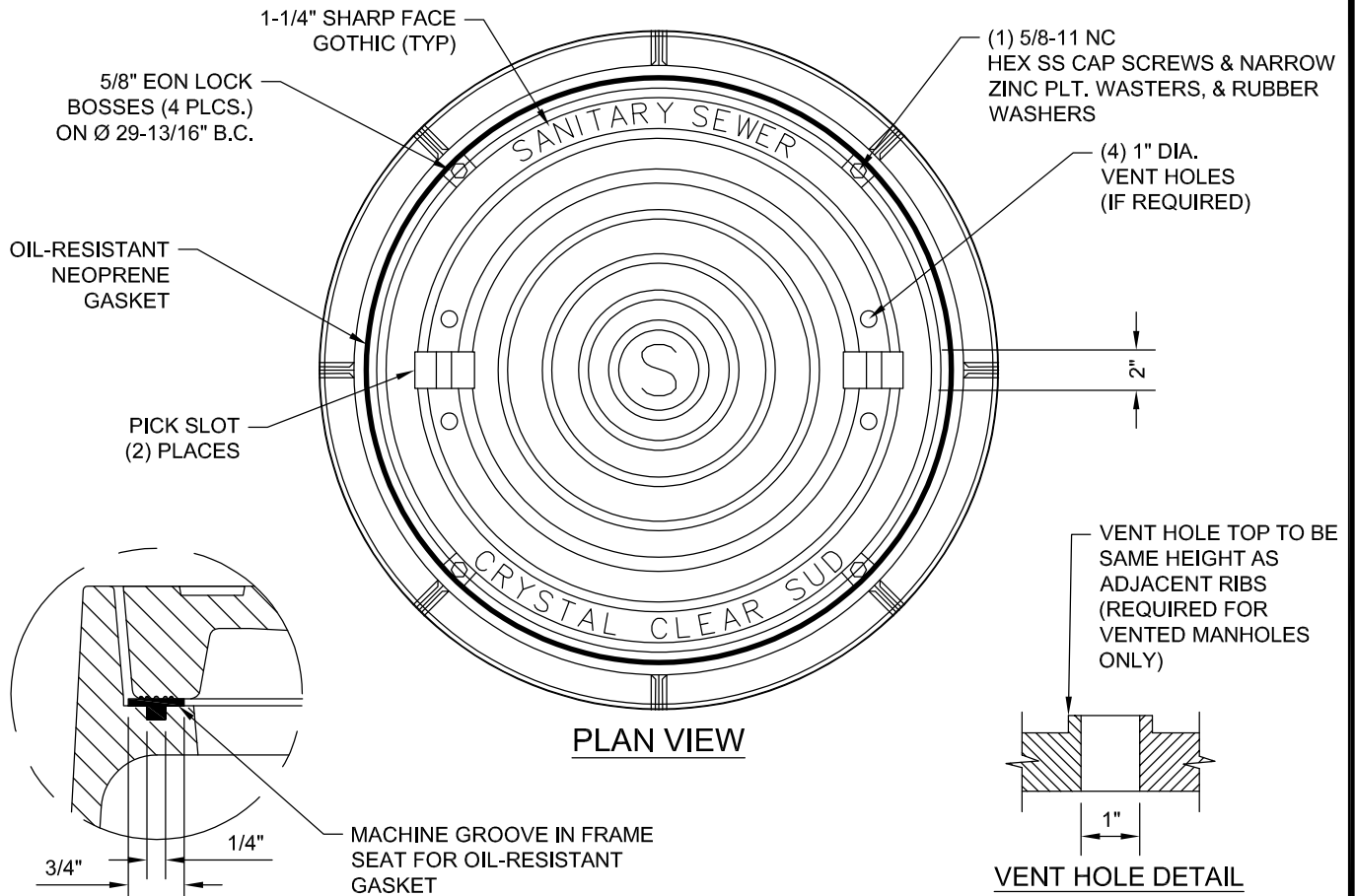
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**NOTES:**

- STANDARD MANHOLE RING AND COVER. ALL APPLICABLE DIMENSIONS SHALL CONFORM TO THE DIMENSIONS SHOWN HERE.
- THE BEARING SURFACES AND GASKET GROOVE SHALL BE MACHINED GROUND.



SANITARY SEWER  
MANHOLE COVER  
DETAIL



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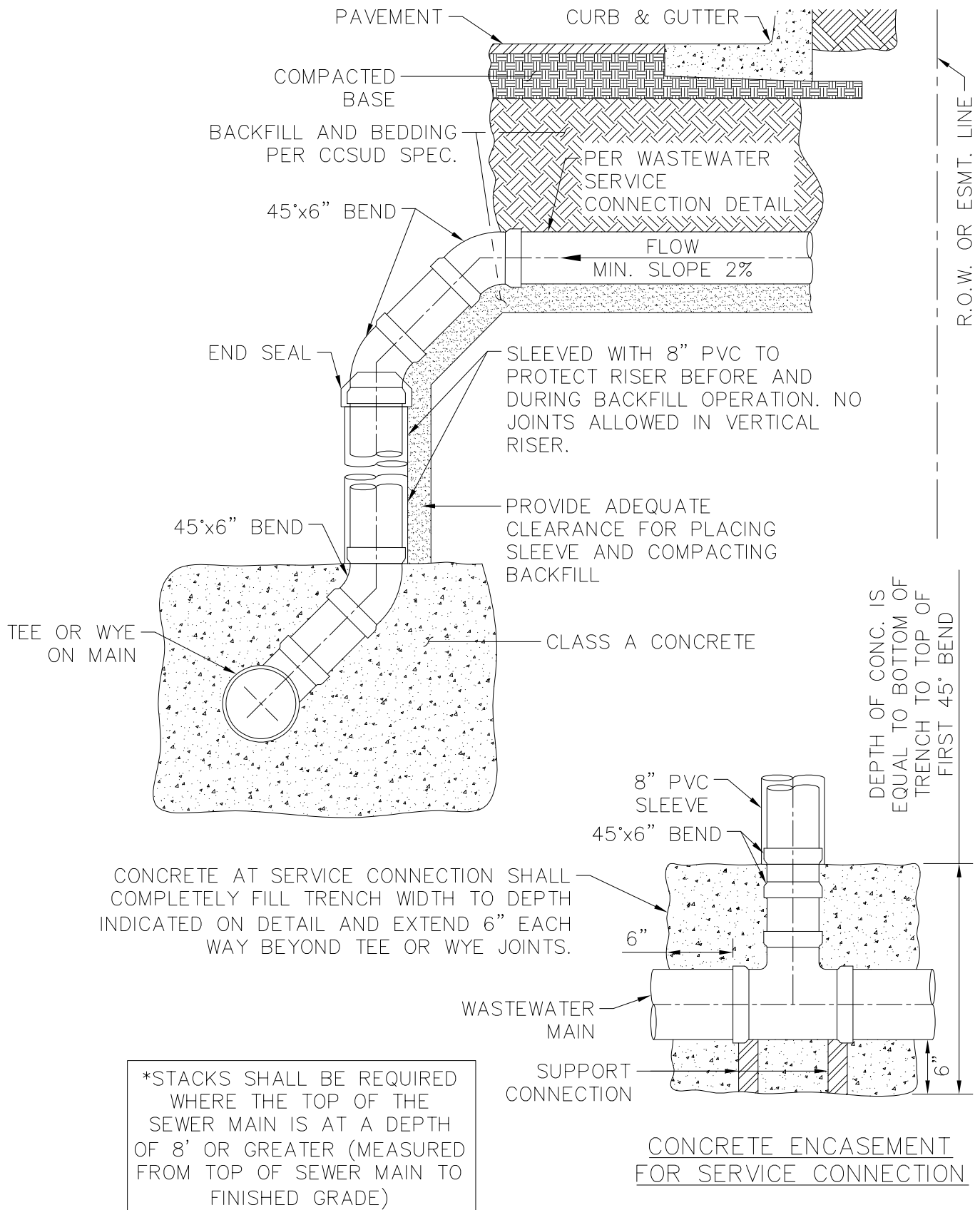
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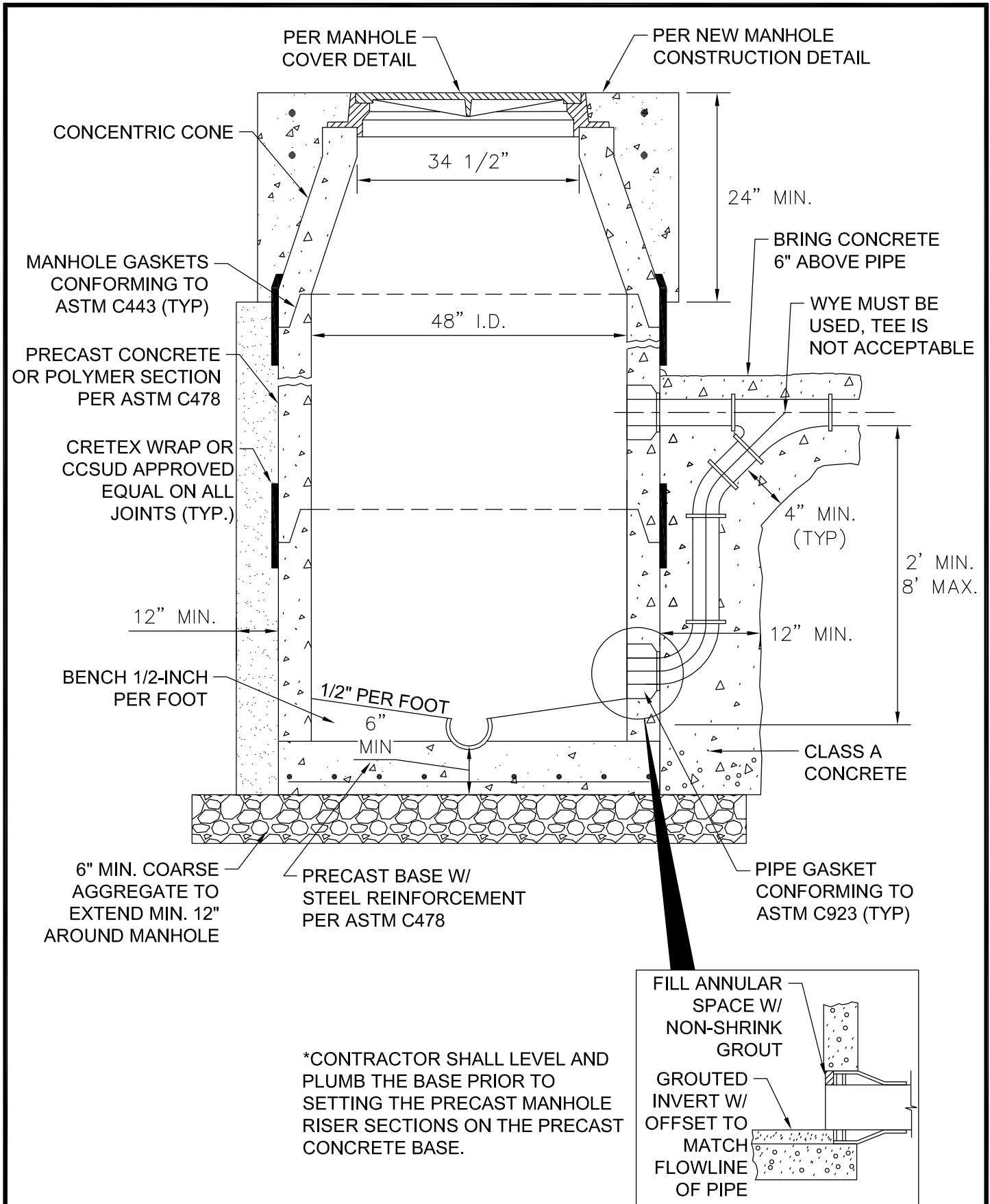
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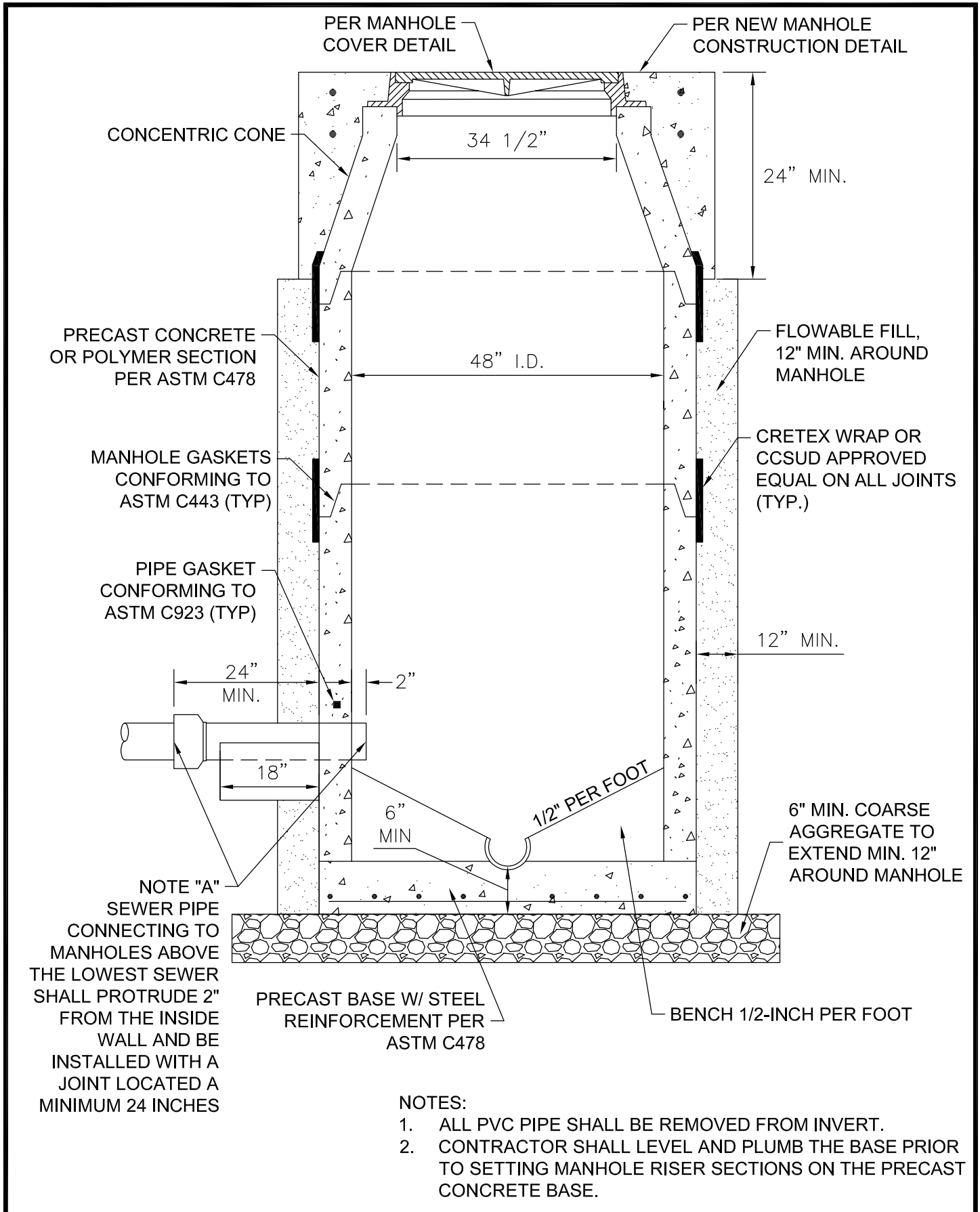
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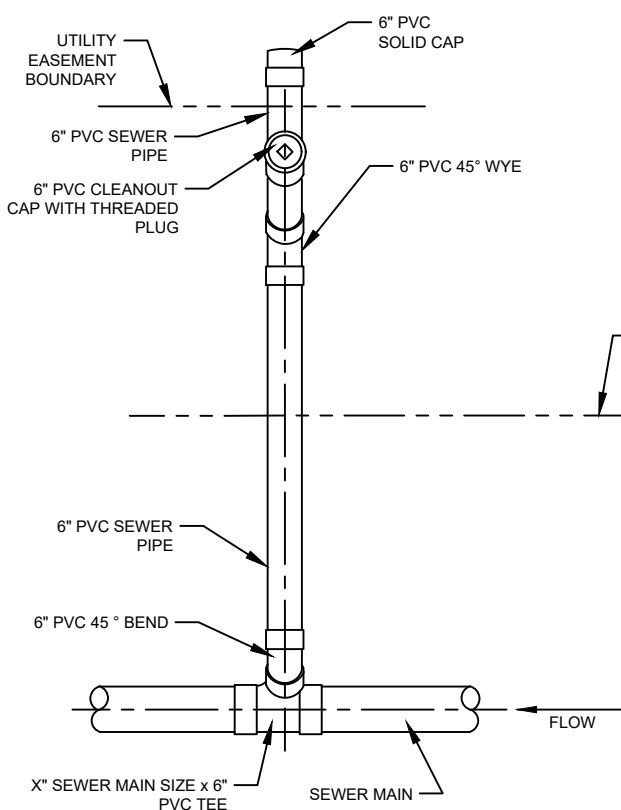
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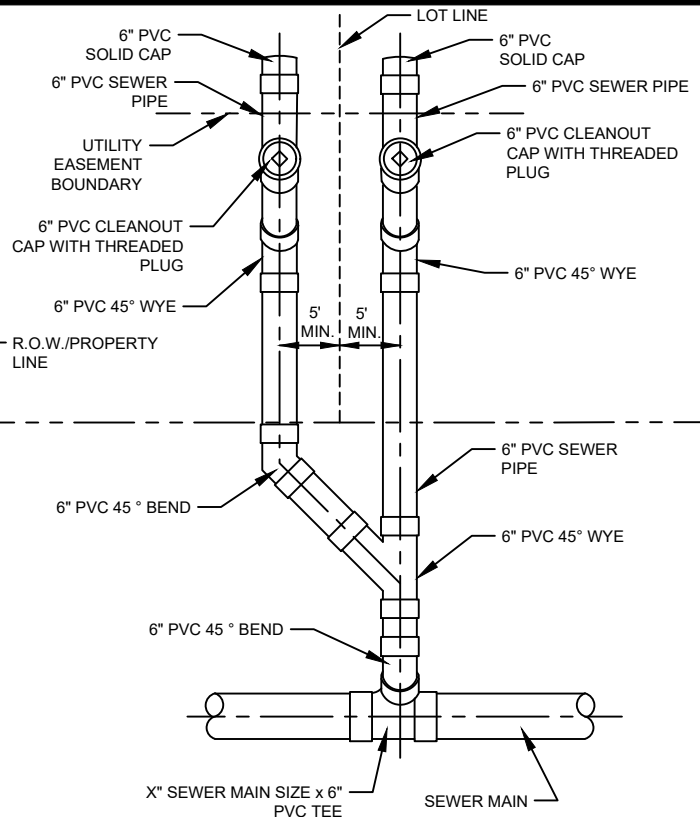




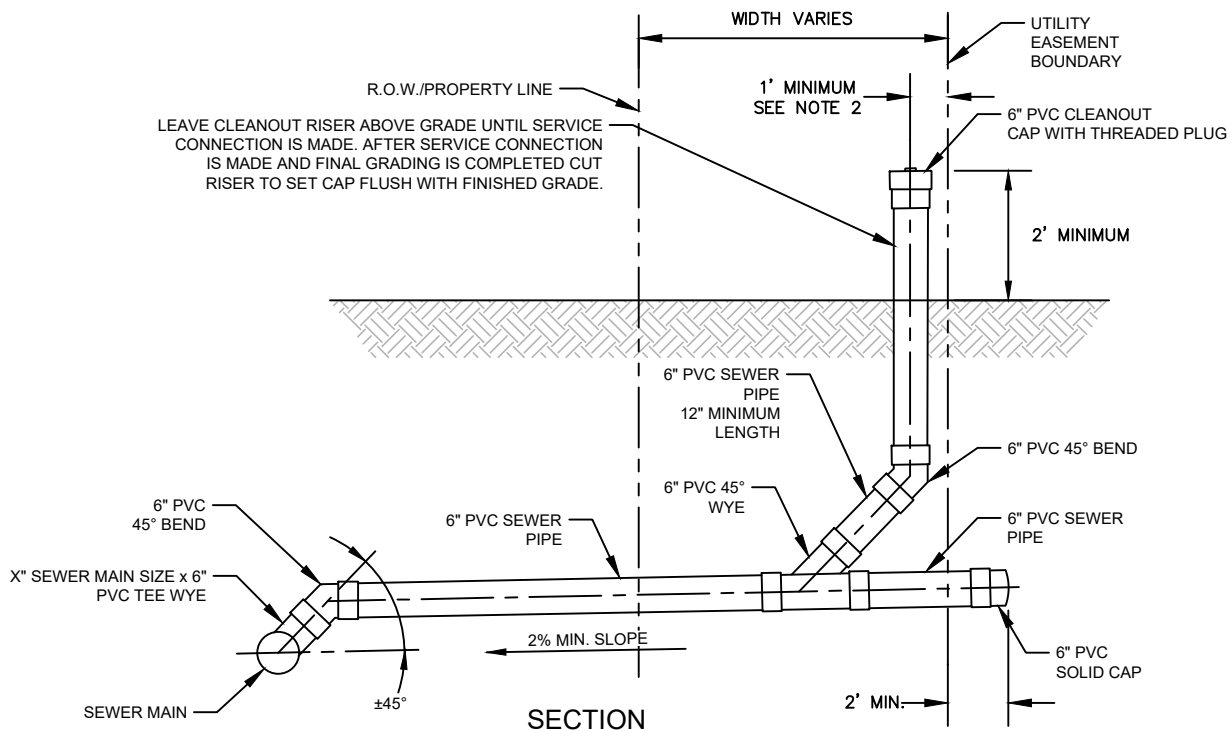




**SINGLE SERVICE PLAN**



**DOUBLE SERVICE PLAN**



**SECTION**

**NOTES:**

- FOR NEW DEVELOPMENTS, CLEANOUTS MAY NOT BE PLACED IN PAVED AREAS (I.E. SIDEWALKS, DRIVEWAYS, OR PARKING LOTS) AND MUST BE LOCATED A MINIMUM OF 6" FROM ALL PAVED AREAS.
- SEWER CLEANOUTS SHALL BE HORIZONTALLY PLACED A MINIMUM OF 5' FROM LOT LINE AND MEET MINIMUM SPACING REQUIREMENTS FROM ALL WATER MAINS PER TAC §290.44.
- SEWER LATERALS SHALL BE INSTALLED BENEATH OTHER UTILITIES (IF POSSIBLE) WITH A MINIMUM VERTICAL CLEARANCE OF 1' ABOVE AND BELOW THE SEWER LATERALS. WATER PIPES REQUIRE 2' OF VERTICAL SEPARATION.
- WHEN MINIMUM SEPARATION REQUIREMENTS FOR LATERALS AND CLEANOUTS CANNOT BE MET, PROTECTION REQUIREMENTS SHALL BE PER TAC §217.53 AND TAC §290.44.



WASTEWATER SERVICE  
CONNECTION DETAIL



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