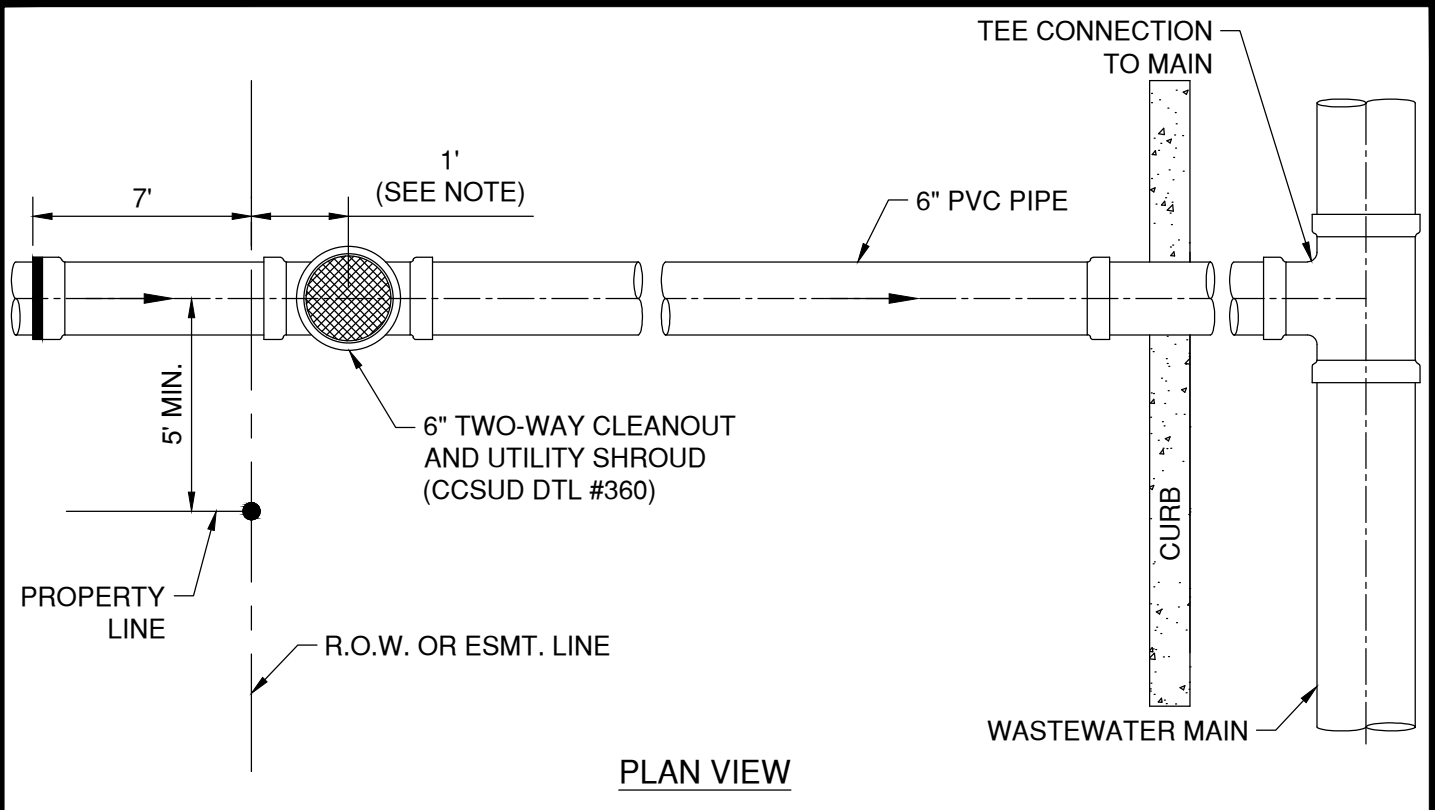


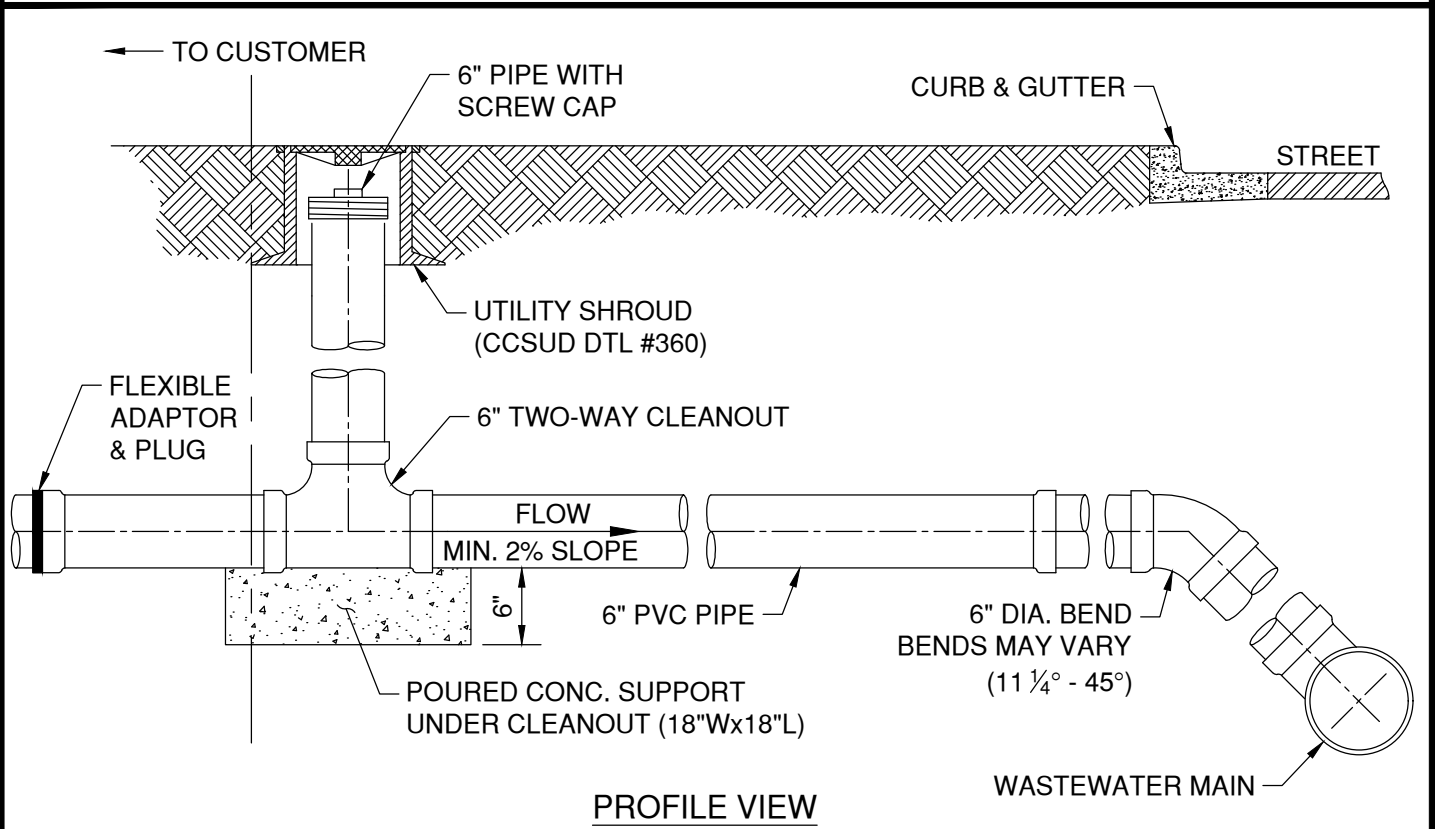


WASTEWATER DETAILS

DTL-302 Single WW Service Connection
DTL-304 WW Sampling Site 5-foot and Under
DTL-305 Control or Mini Manhole
DTL-306 WW Cleanout Adjustment to Grade in Driveways
DTL-307 Security Post Sewer Monitor Equipment
DTL-310 Concrete Encasement
DTL-320 Manhole Plan
DTL-322 New Manhole Construction and Minor MH Adjustment
DTL-324 WW Manhole w Drop Inlet on CIP Base
DTL-325 WW Manhole w Drop Inlet on Precast Base
DTL-327 WW Manhole on CIP Foundation
DTL-328 WW Manhole on Precast Base
DTL-329 MH Ring and Encasement
DTL-331 SS Manhole Cover
DTL-334 Vented SS Manhole Cover
DTL-335 Shallow MH-Precast or Mono Top Slab and Chart
DTL-340 Abandoned Manhole
DTL-350 Deflection Testing Mandrel
DTL-360 Utility Shroud Sewer Cleanout Assembly



PLAN VIEW



PROFILE VIEW

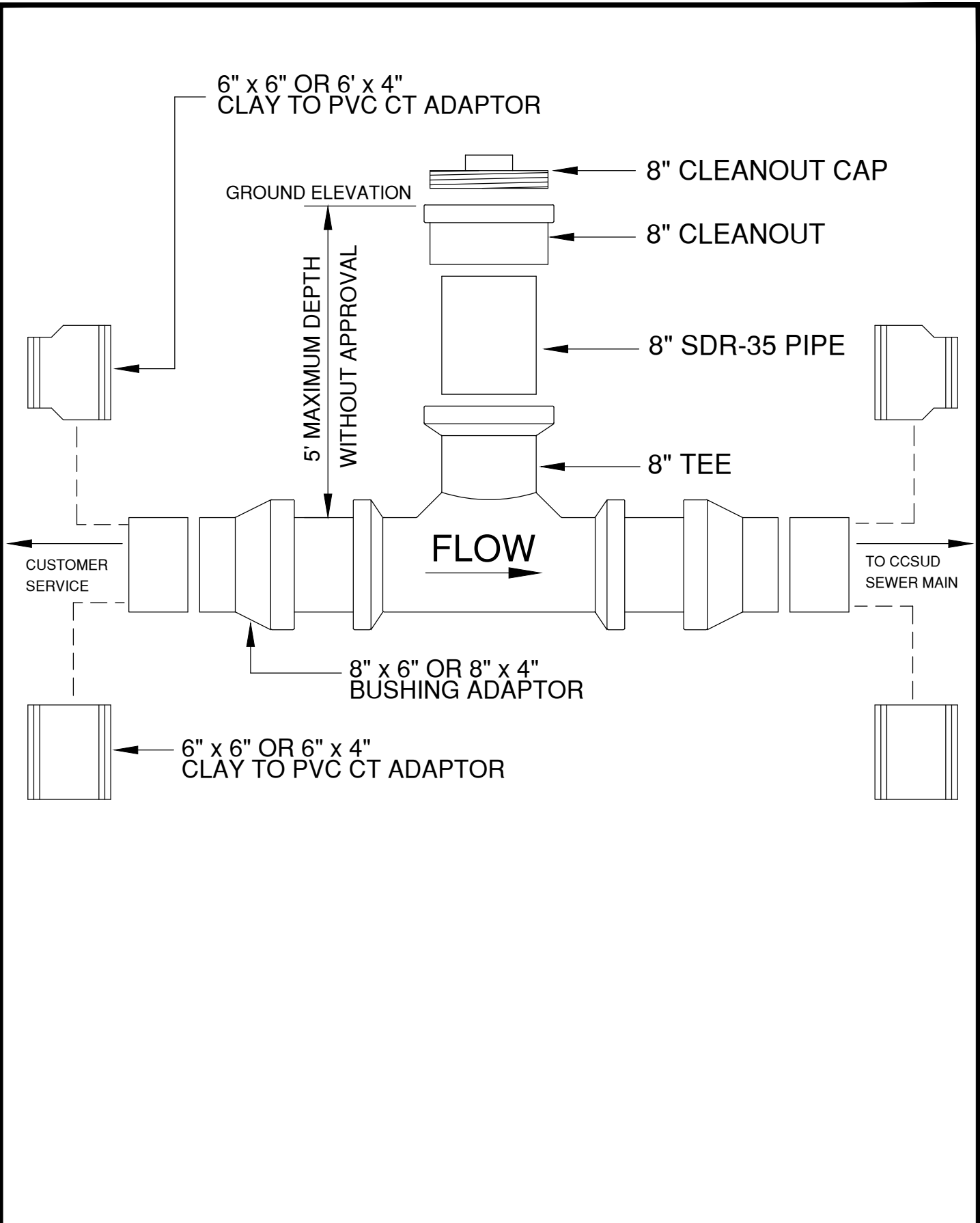
*CLEANOUT SHALL NOT BE PLACED WITHIN SIDEWALK OR DRIVEWAY. IF SIDEWALK EXISTS AT EDGE OF PROPERTY LINE, CLEANOUT CAN BE LOCATED UP TO 1' WITHIN PROPERTY. CONSISTENT PLACEMENT IS REQUIRED.


PROPERTY OF 	DTL #302 SINGLE WASTEWATER SERVICE CONNECTION DETAIL	M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
			08/17/21	
			SHEET 1 OF 2	

NOTES:

1. CONTRACTOR, DURING SUBDIVISION CONSTRUCTION, SHALL INSTALL WASTEWATER CONNECTION TO MAIN, 6" STUB WITH 6" SERVICE BRANCH WITH 2-WAY CLEANOUT, CONCRETE SUPPORT (MIN. 18"Wx18"Lx6"H), RISER FOR CLEAN OUT (CAPPED), UTILITY SHROUD, 7' EXTENSION, AND PLUG. ALL WASTEWATER PIPING SHALL HAVE ELASTOMERIC GASKET TYPE JOINTS AND SHALL SLOPE DOWNWARD TO MAIN 2%, 1/4" PER FOOT, MINIMUM TO 45° MAXIMUM. DEPTH OF SERVICE STUB AT PROPERTY LINE WILL BE SHOWN ON PLANS BY ENGINEER OR DESIGNATED REPRESENTATIVE IF GREATER THAN 4', OTHERWISE, THE INSTALLED DEPTH WILL TYPICALLY BE 4' TO 6'. IF WASTEWATER SERVICE LINE TO MAIN REQUIRES DEFLECTION EXCEEDING 45°, REFER TO DETAIL DRAWING 301. ALL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH INFORMATION SHOWN ON APPLICABLE STANDARD DRAWINGS AND WILL BE INSPECTED BY CCSUD CONSTRUCTION INSPECTION PERSONNEL.
2. CUSTOMER SHALL REMOVE PLUG, INSTALL 4" WASTEWATER LINE [EXTEND 4" PIPE 6" MINIMUM INTO 6" PIPE AND JOINT WITH FLEXIBLE ADAPTOR]. IF WASTEWATER WILL NOT SATISFACTORILY FLOW BY GRAVITY TO SEWER MAIN ADJACENT TO PROPERTY, PUMP EQUIPMENT MUST BE PROVIDED BY THE CUSTOMER AS PART OF CUSTOMER'S WASTEWATER SYSTEM.
3. CUSTOMER IS RESPONSIBLE FOR PIPING SYSTEM UNTIL WASTEWATER IS CONNECTED. ANY MISSING OR DAMAGED PARTS SHALL BE REINSTALLED BY CUSTOMER WHO SHALL GUARANTEE, FOR A PERIOD OF TWO (2) YEARS FROM DATE OF FINAL ACCEPTANCE, THAT CONNECTIONS TO CCSUD SYSTEMS ARE FREE FROM DEFECTS IN WORKMANSHIP OR MATERIALS. CUSTOMER ALSO HAS THE RESPONSIBILITY TO ASSURE THAT 2-WAY CLEANOUTS REMAIN CLEAR OF SIDEWALKS AND OTHER OBSTRUCTIONS.
4. CCSUD'S ACTIVITY IS LIMITED TO INSPECTION OF CONNECTIONS TO THE WASTEWATER SYSTEM. FOR MAINTENANCE PURPOSES, CCSUD'S RESPONSIBILITY ENDS AT THE CUSTOMER'S WASTEWATER CONNECTION TO THE 2-WAY CLEANOUT OR THE PROPERTY LINE, WHICHEVER IS CLOSER TO WASTEWATER MAIN.
5. PIPING IN STREET RIGHT-OF-WAY AND IN EASEMENT AREA SHALL BE BEDDED IN GRANULAR MATERIALS AS REQUIRED BY CCSUD STANDARD SPECIFICATION; MATERIALS SHALL BE AS SPECIFIED; BACKFILL ABOVE THE GRANULAR BEDDING. SERVICE LINES IN THESE AREAS SHALL HAVE A MINIMUM COVER BELOW FINAL STREET GRADE OF 42"; ANY EXCEPTION MUST BE SPECIFICALLY APPROVED BY THE ENGINEER.

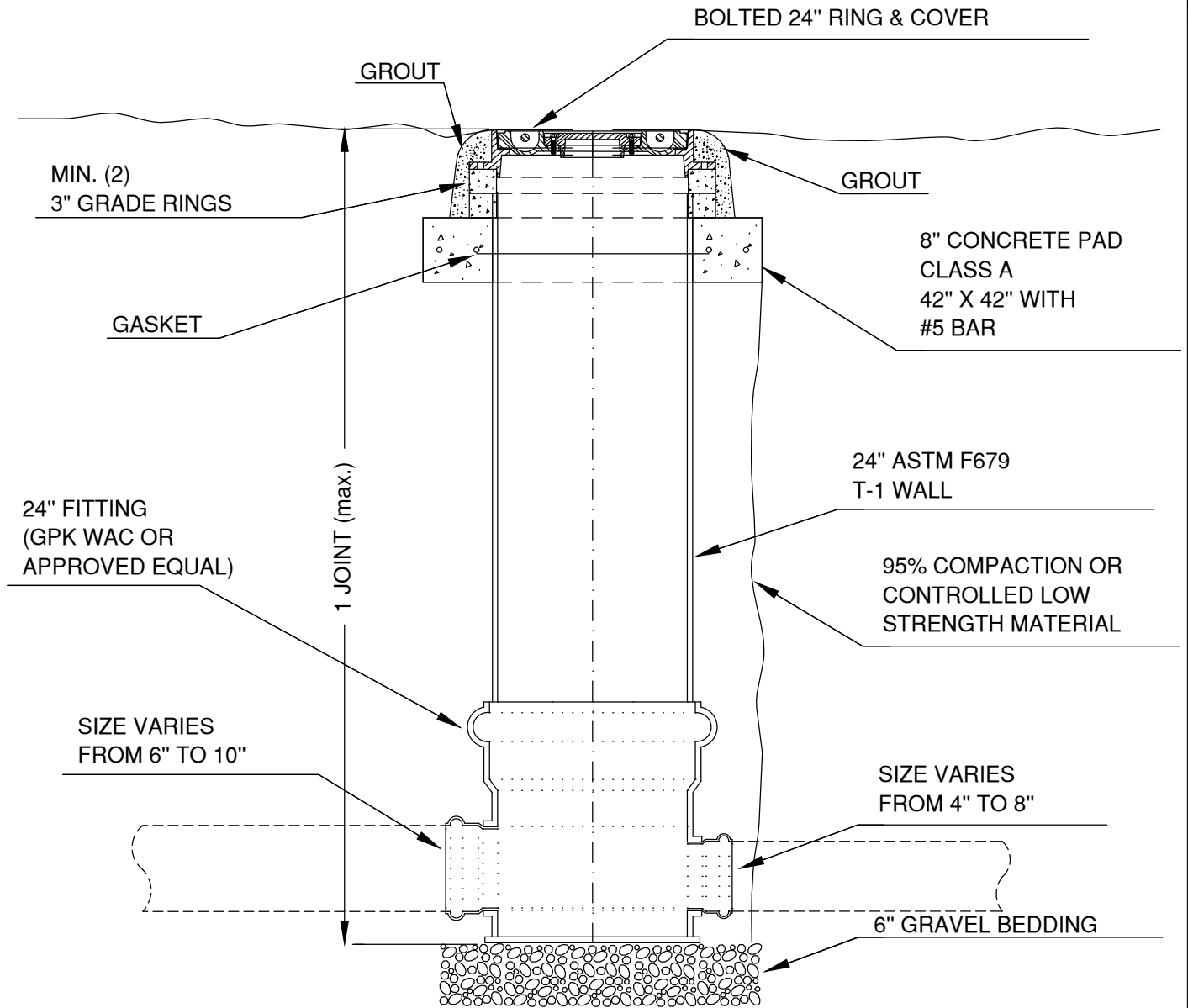
 <p>PROPERTY OF CRYSTAL CLEAR SPECIAL UTILITY DISTRICT</p>	<p>DTL #302 SINGLE WASTEWATER SERVICE CONNECTION DETAIL</p>	 <p>M&S ENGINEERING ELECTRICAL CIVIL MEP TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</p>	APPROVED	REVISION
			08/17/21	
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		2 OF 2		



PROPERTY OF 	DTL #304 WASTEWATER SAMPLING SITE FOR SERVICE 5' AND UNDER IN DEPTH (FROM GROUND ELEV.)	 M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
				04/30/03
SHEET 1 OF 1				

DISTRICT SIDE

OWNER SIDE



PROPERTY OF



DTL #305
 CONTROL OR MINI MANHOLE



M&S ENGINEERING
 ELECTRICAL | CIVIL | MEP
 TXENG FIRM # F-1394 | TBPELS FIRM #10169800
 WWW.MSENGR.COM | (830) 228-5446

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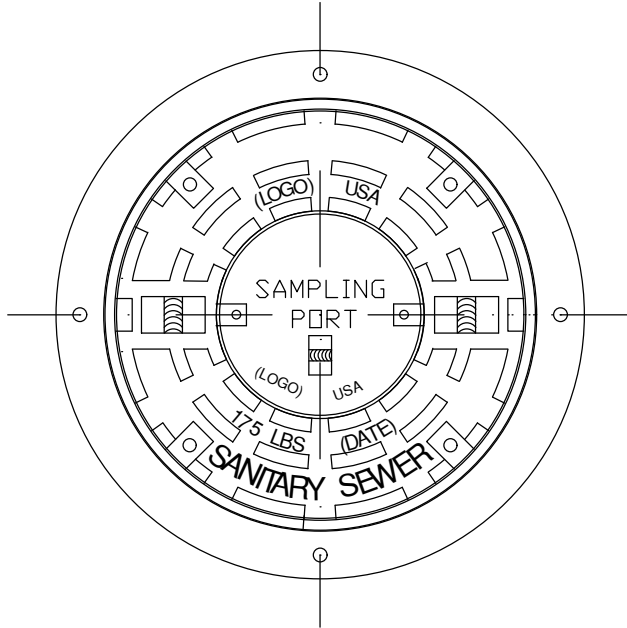
REVISION

04/16/03

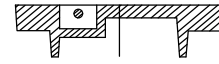
SHEET

1 OF 2

BOLTED 24" RING & COVER



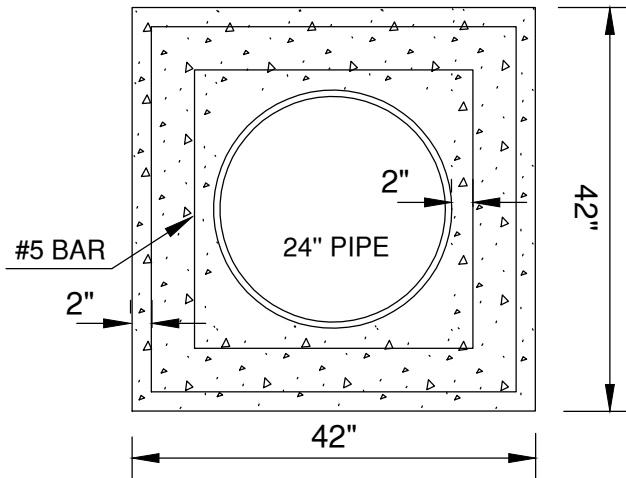
SAMPLING PORT COVER

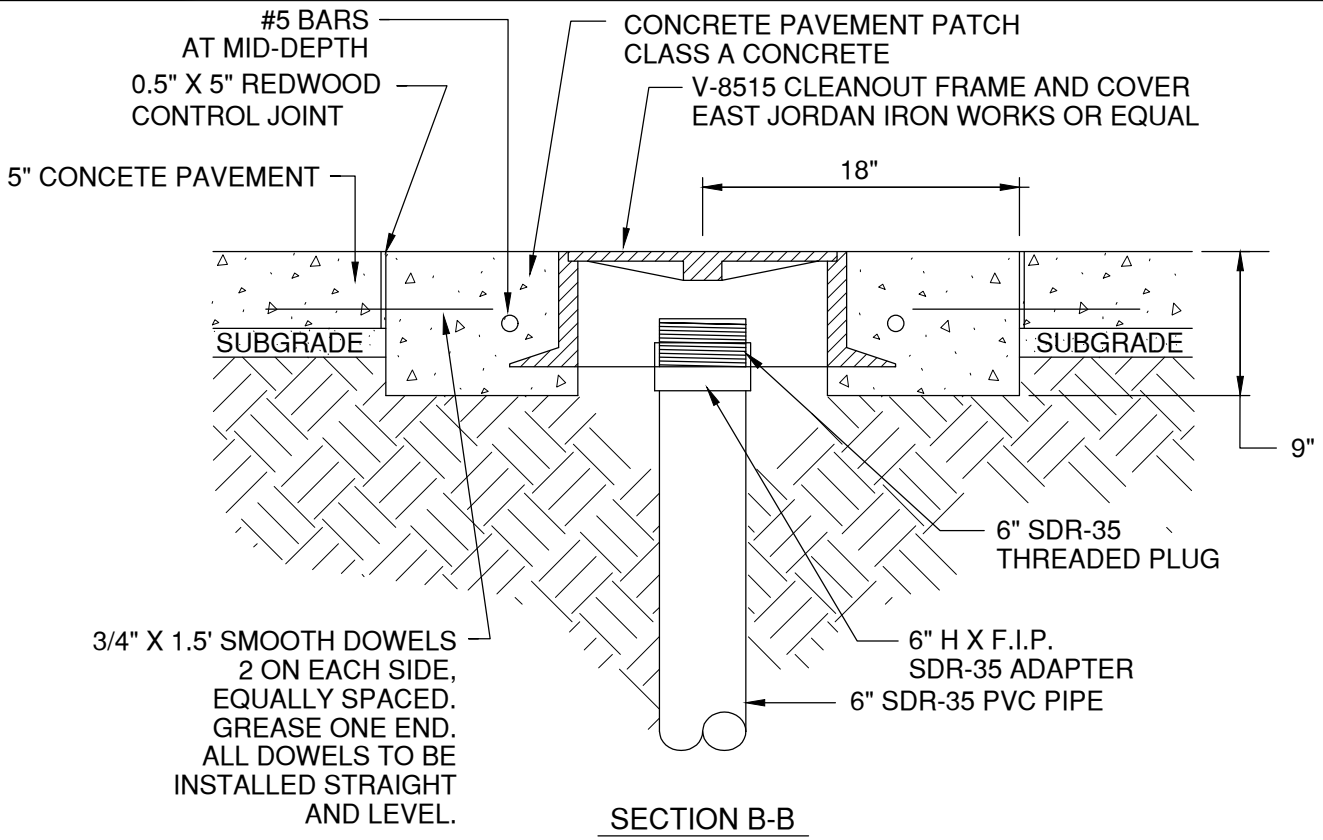


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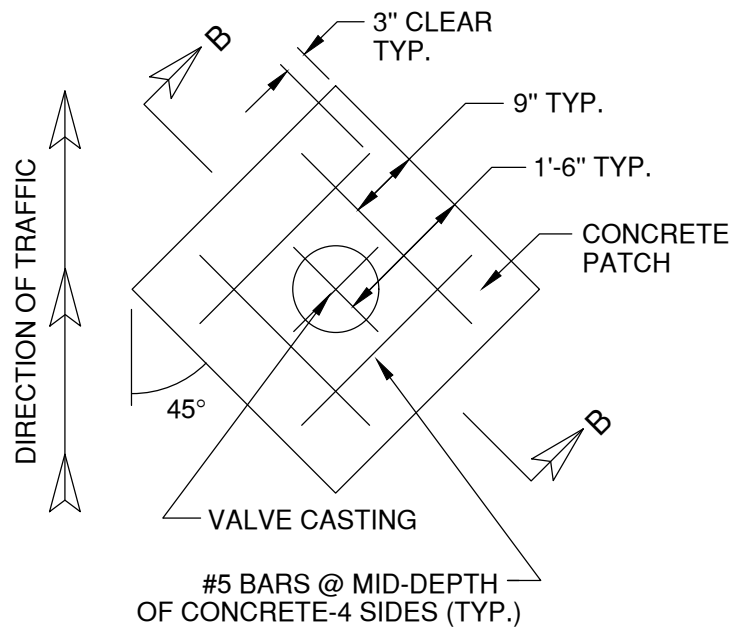
48" CONCRETE MANHOLE WITH
 24" SAMPLING PORT LID MAY BE
 USED IN PLACE OF THIS CONTROL
 MANHOLE.

42" X 42" CONCRETE PAD





SECTION B-B

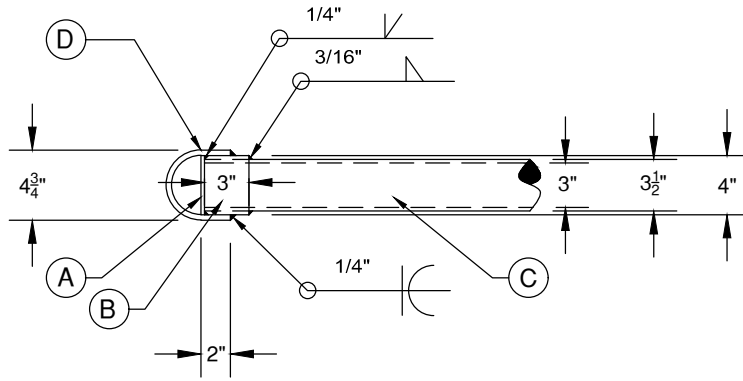


PLAN VIEW

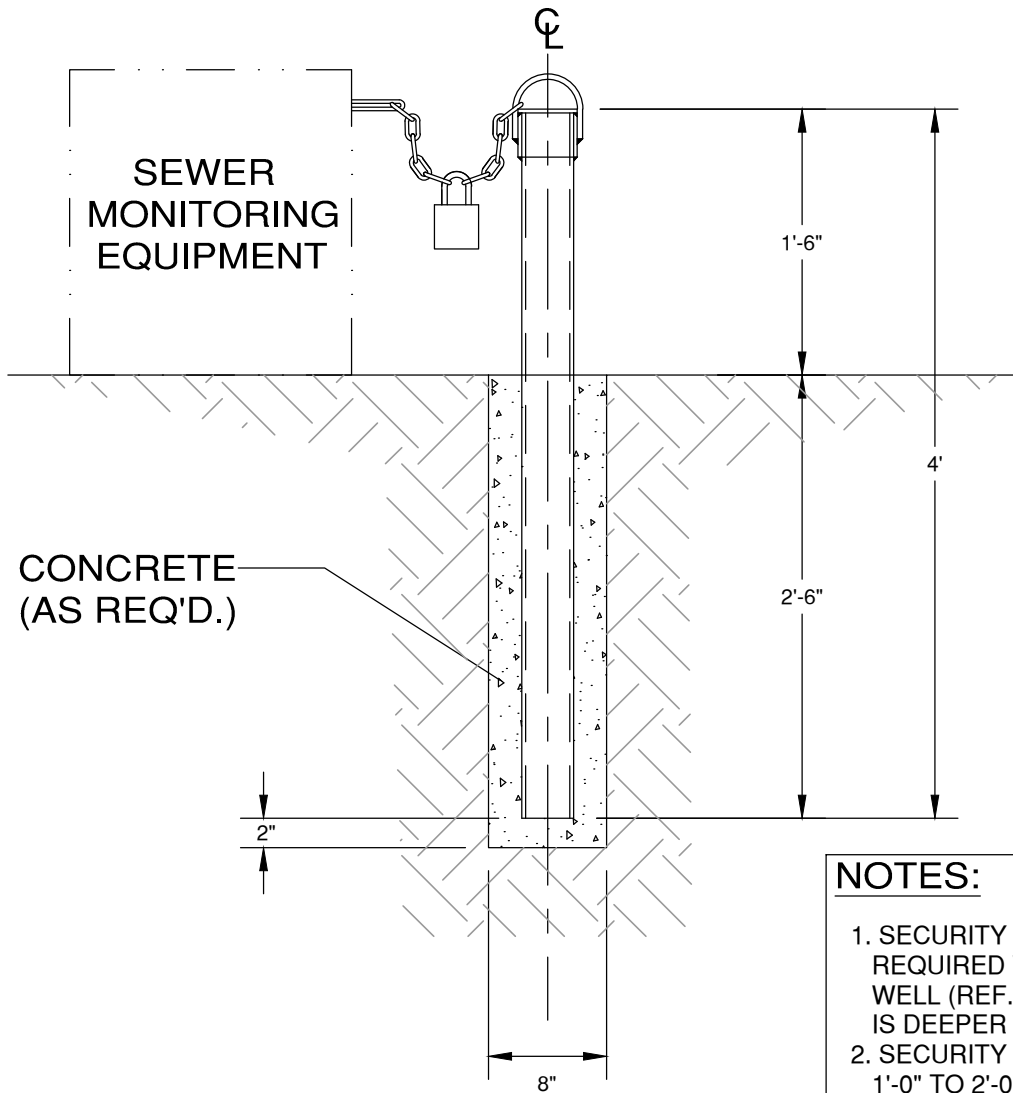
NOTES:

1. SERVICES SHOULD BE DESIGNED TO AVOID ALIGNMENT WITH DRIVEWAYS.
2. SUBGRADE SHALL BE COMPACTED AS PER, SUBGRADE PREPARATION.
3. FRAME SHALL BE ADJUSTED TO GRADE AFTER FINAL LIFT OF OVERLAY IS IN PLACE.
4. REINFORCING STEEL SHALL MEET, REINFORCING STEEL.

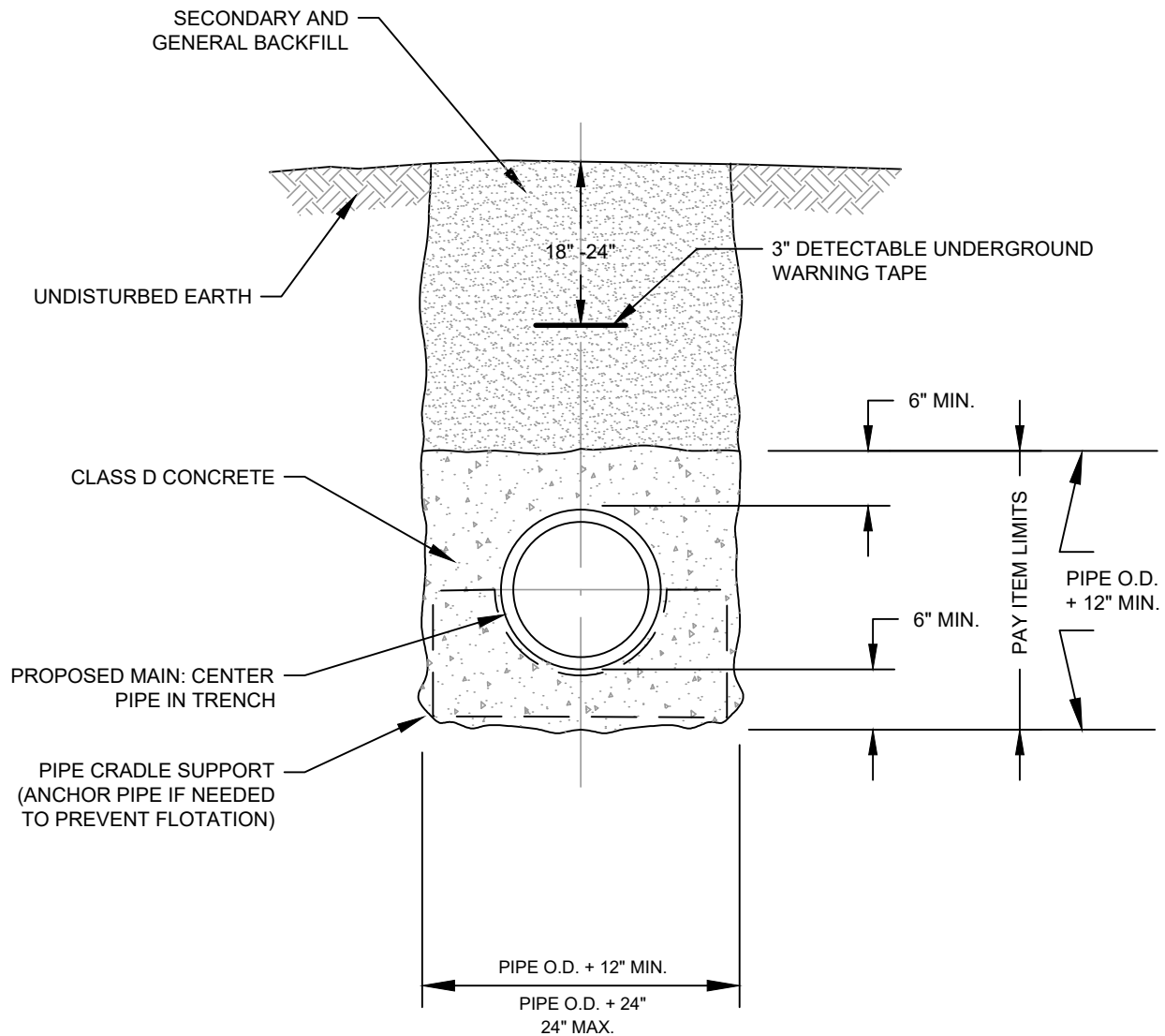
	DTL #306 WASTEWATER CLEANOUT ADJUSTMENT TO GRADE IN DRIVEWAYS	M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
				04/15/03
			SHEET 1 OF 1	



- DETIAL A (1 EA.) 1/4" X 4" DIA. STEEL PLATE
- DETIAL B (1 EA.) 4" O.D. X 3 5/8" I.D. X 3" LENGTH STD. GALV. PIPE
- DETIAL C (1 EA.) 3 1/2" O.D. X 3" I.D. X 3'-11 3/4" LENGTH STD. GALV. PIPE
- DETIAL D (1 EA.) 3/8" X 12" STEEL ROD



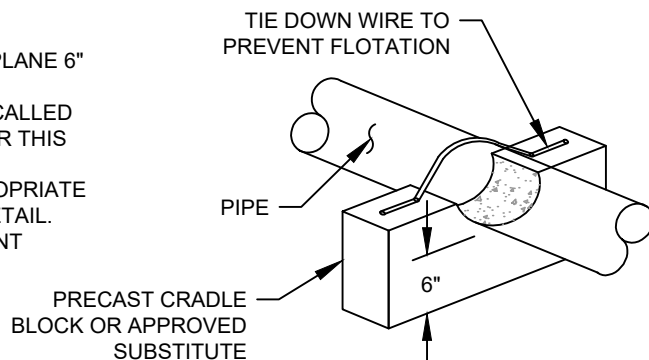
- NOTES:**
1. SECURITY POST WILL BE REQUIRED WHERE SAMPLING WELL (REF. DWG. 304) IS DEEPER THAN 5'-0"
 2. SECURITY POST TO BE LOCATED 1'-0" TO 2'-0" FROM SAMPLING WELL



CONCRETE ENCASMENT



NOTES:

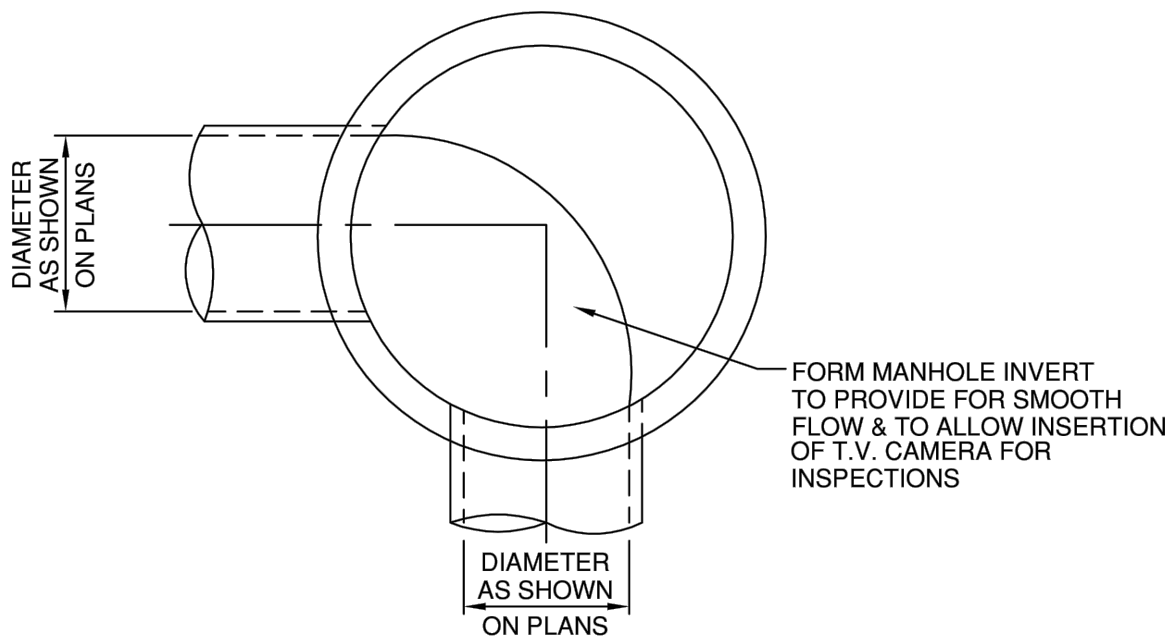
1. ALL CONCRETE ENCASMENT SHALL BE POURED AT A PLANE 6" ABOVE THE PIPE BETWEEN EXCAVATED TRENCH WALL.
2. CONCRETE ENCASMENT WILL BE USED ONLY WHERE CALLED OUT IN THE PLANS AND LIMITS OF PAYMENT WILL BE PER THIS DETAIL.
3. BACKFILL AND RESTORATION WORK WILL BE PER APPROPRIATE TRENCH DETAIL WITH EMBEDMENT FOLLOWING THIS DETAIL.
4. SUPPORTS ARE SUBSIDIARY TO CONCRETE ENCASMENT



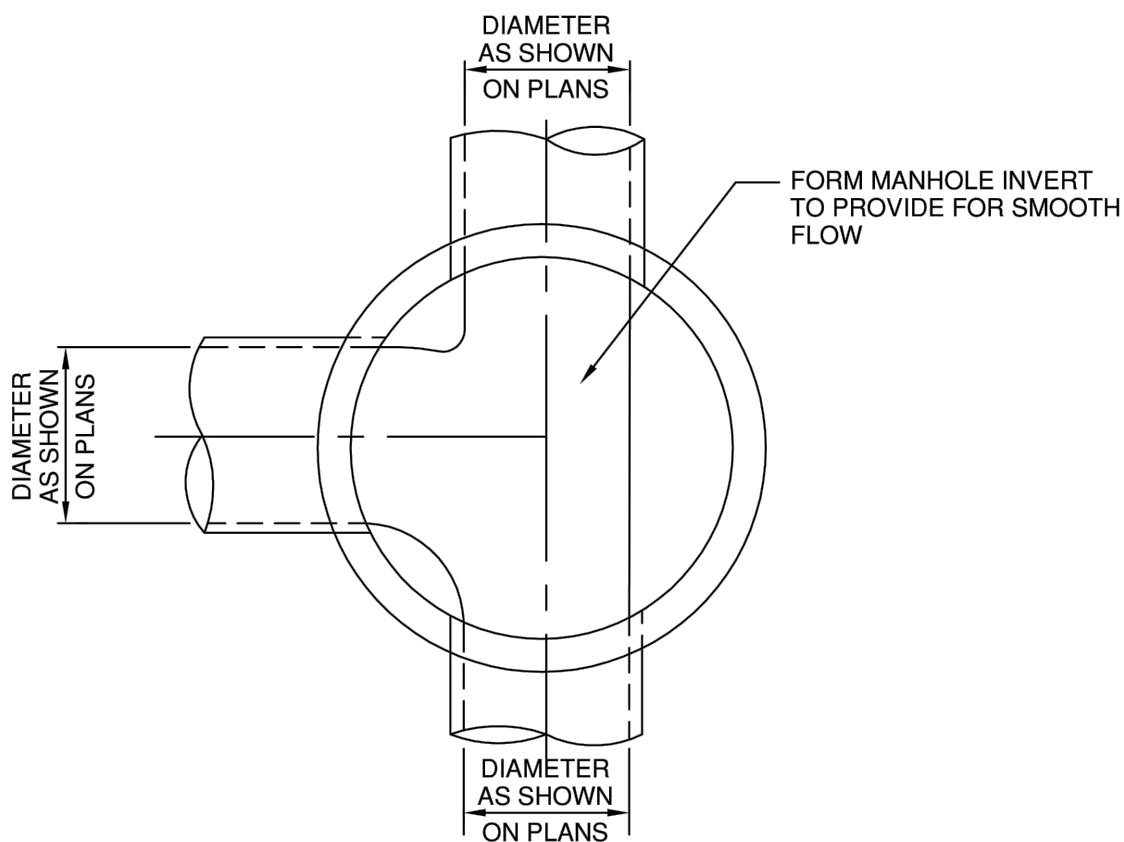
PIPE CRADLE SUPPORT

NOT TO SCALE

PROPERTY OF 	DTL #310 CONCRETE ENCASMENT	 M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
				FEB 2022
			SHEET 1 OF 1	



TYPICAL MANHOLE AT ANGLE IN SEWER



TYPICAL JUNCTION MANHOLE

PROPERTY OF



DTL #320
 MANHOLE INVERT PLAN



M&S ENGINEERING
 ELECTRICAL | CIVIL | MEP
 TXENG FIRM # F-1394 | TBPELS FIRM #10169800
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1 OF 2

STANDARD MANHOLE

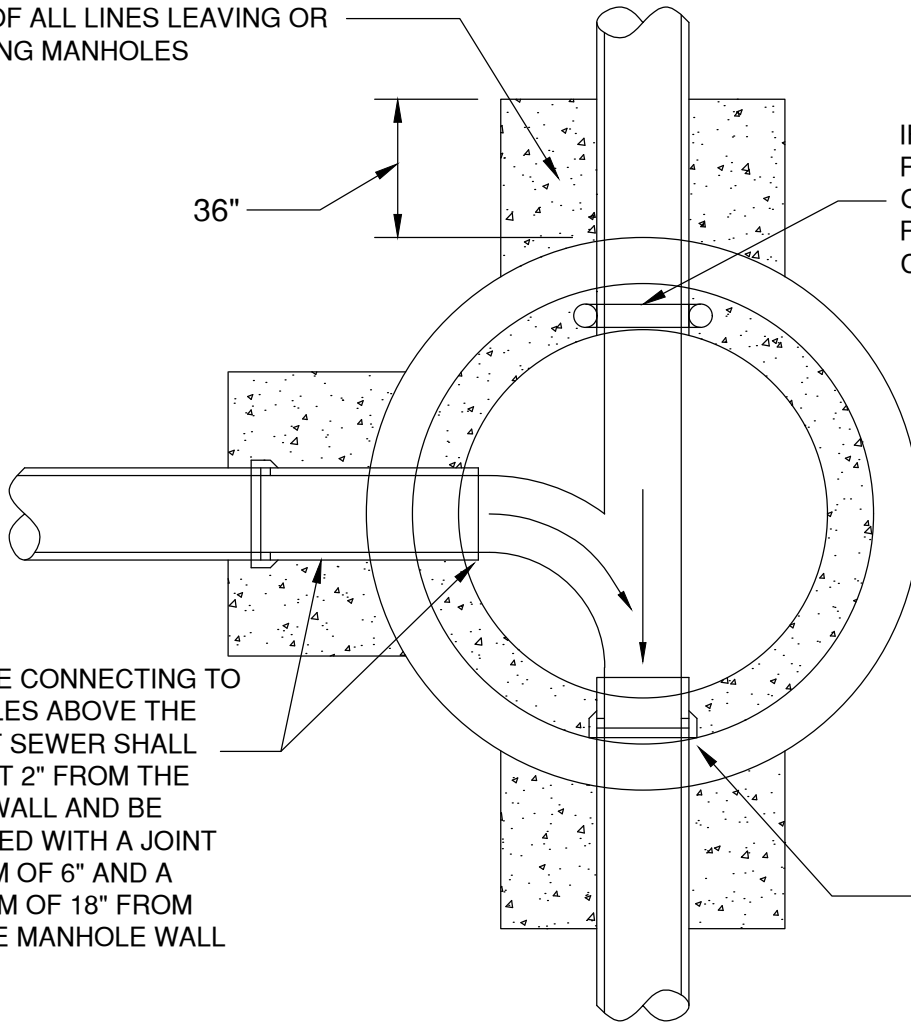
CONCRETE CRADLE TO NEAREST
 POINT OF ALL LINES LEAVING OR
 ENTERING MANHOLES

36"

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

THE PIPE CONNECTING TO
 MANHOLES ABOVE THE
 LOWEST SEWER SHALL
 PROJECT 2" FROM THE
 INSIDE WALL AND BE
 INSTALLED WITH A JOINT
 MINIMUM OF 6" AND A
 MAXIMUM OF 18" FROM
 OUTSIDE MANHOLE WALL

NO JOINTS FOR PIPE
 WILL BE ALLOWED
 WITHIN WALL SECTION



MANHOLE FLOOR PLAN

AUGUST 1998

PROPERTY OF



DTL #320
 STANDARD MANHOLE
 MANHOLE FLOOR PLAN



M&S ENGINEERING
 ELECTRICAL | CIVIL | MEP
TXENG FIRM # F-1394 | TBPELS FIRM #10169800
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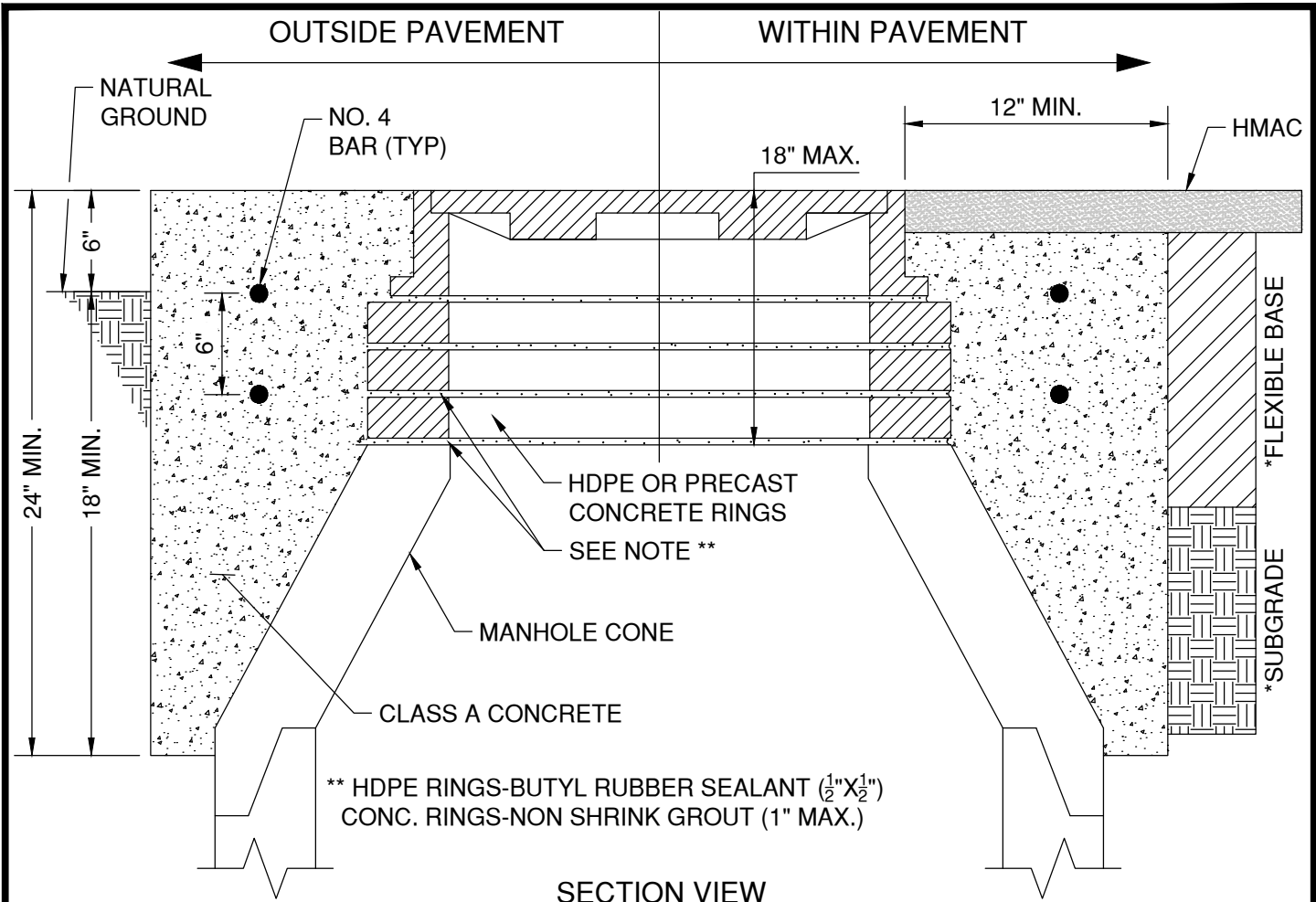
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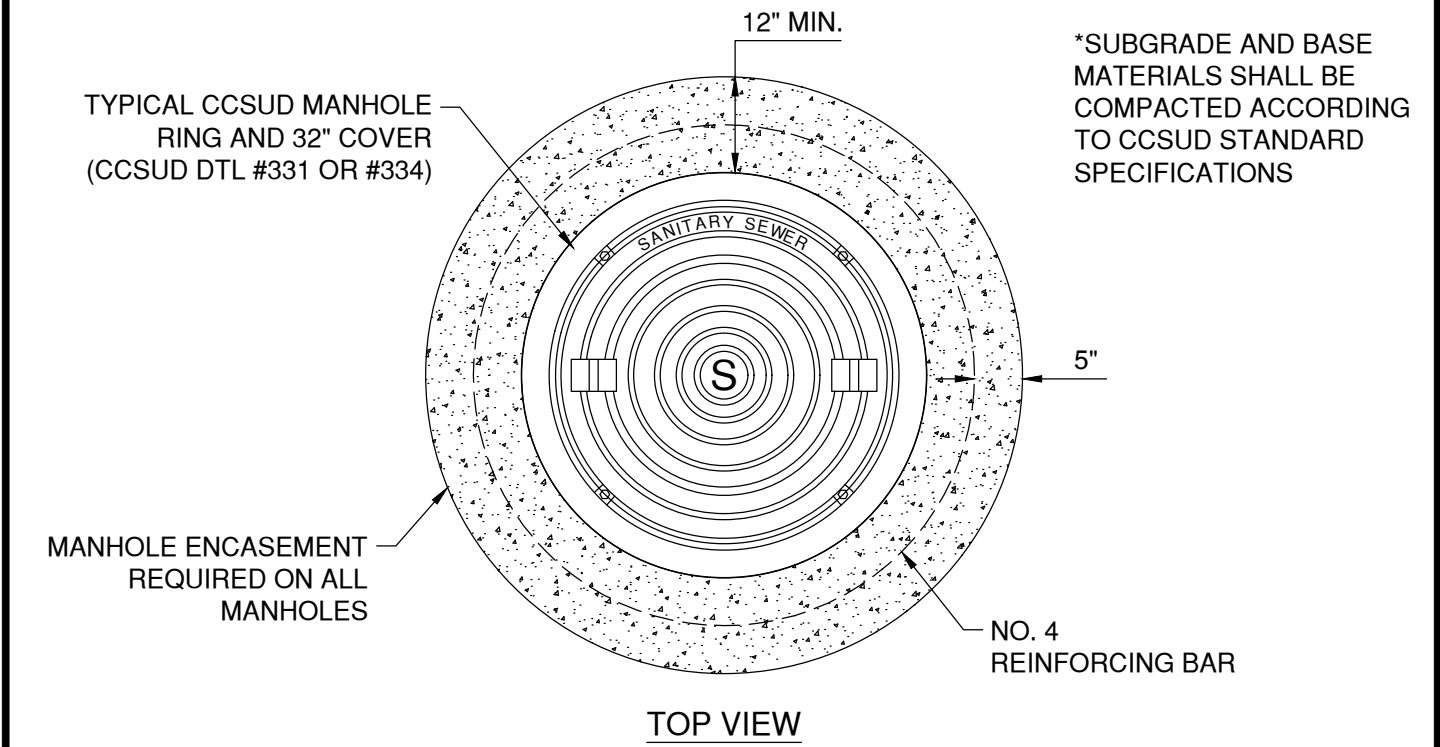
2 OF 2



SECTION VIEW

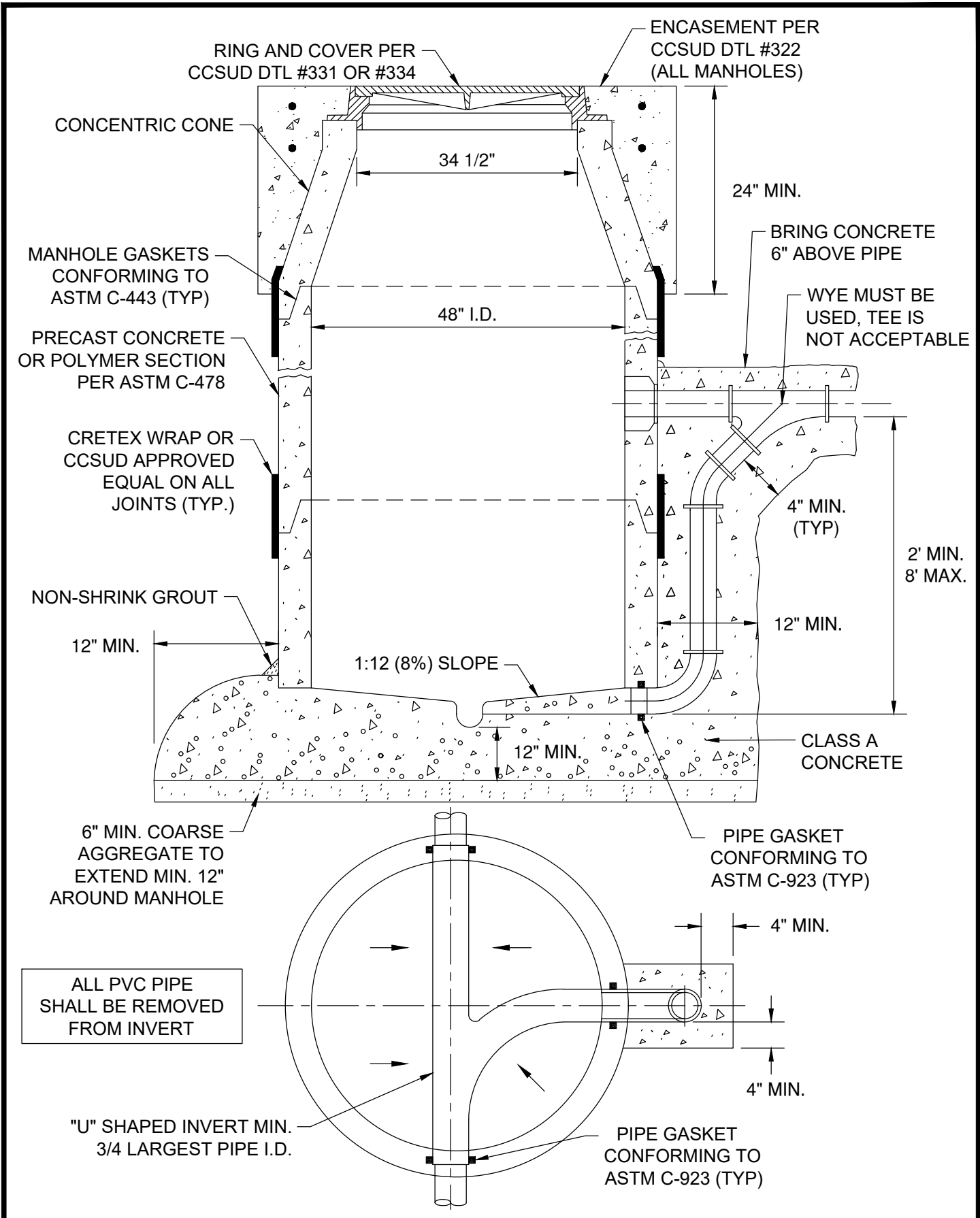
** HDPE RINGS-BUTYL RUBBER SEALANT (1/2"X1/2")
 CONC. RINGS-NON SHRINK GROUT (1" MAX.)

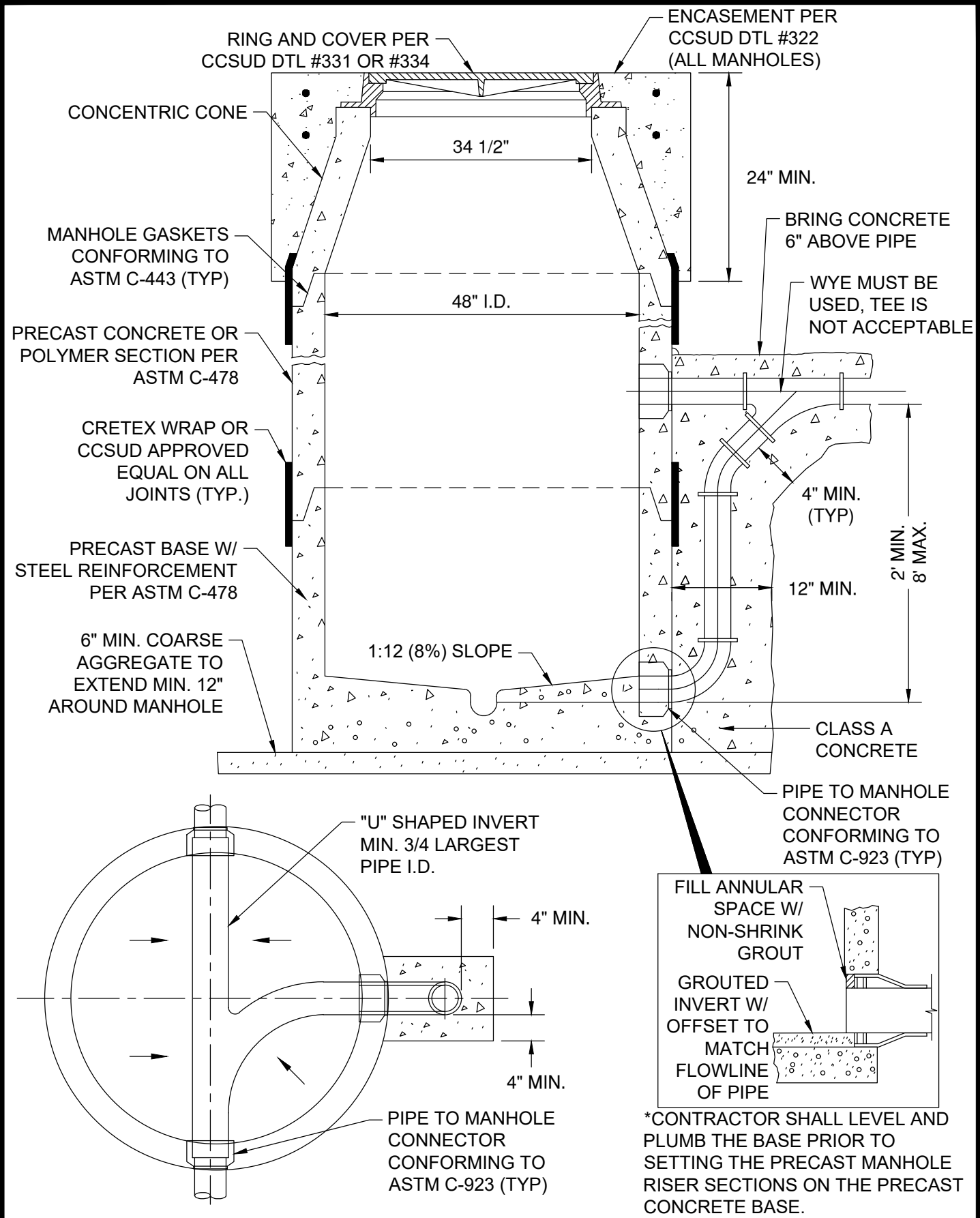
*SUBGRADE AND BASE MATERIALS SHALL BE COMPACTED ACCORDING TO CCSUD STANDARD SPECIFICATIONS

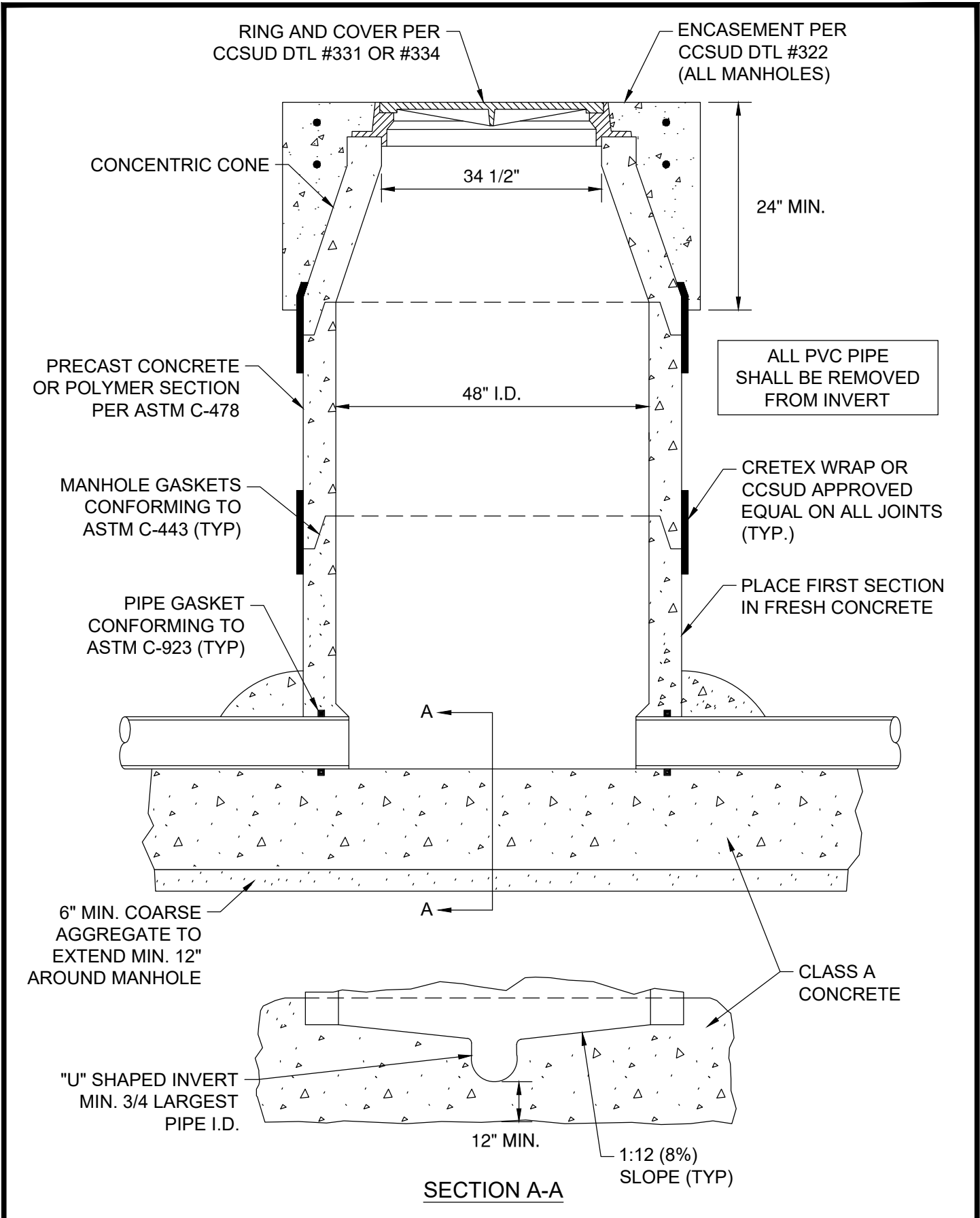


TOP VIEW



	DTL #322 NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT	M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
			08/17/21	
			SHEET 1 OF 1	

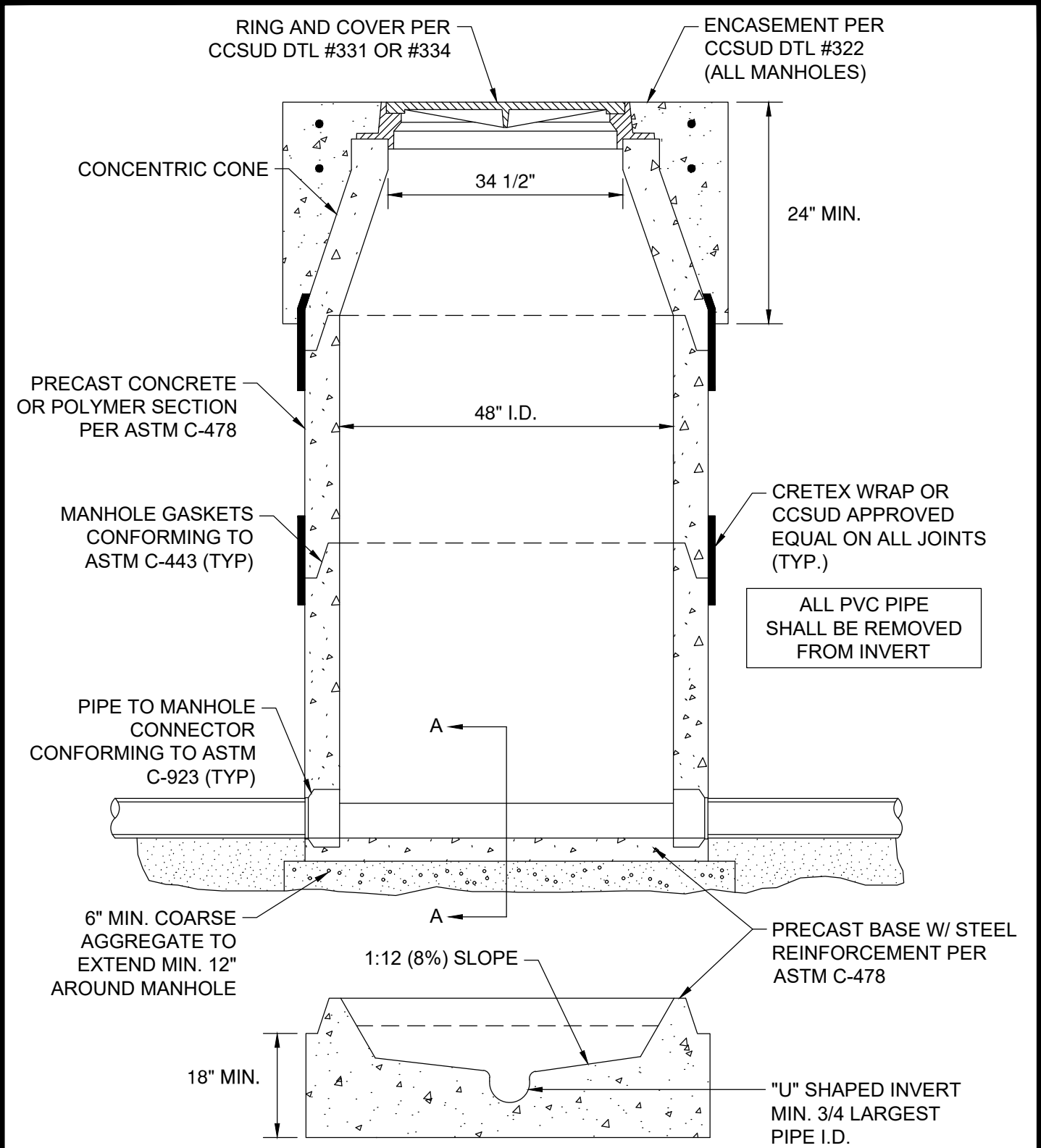






SECTION A-A

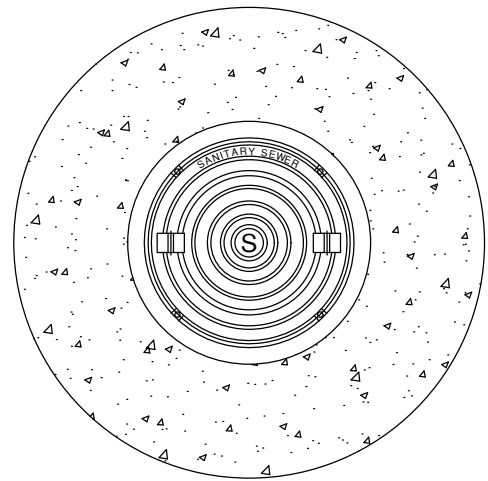
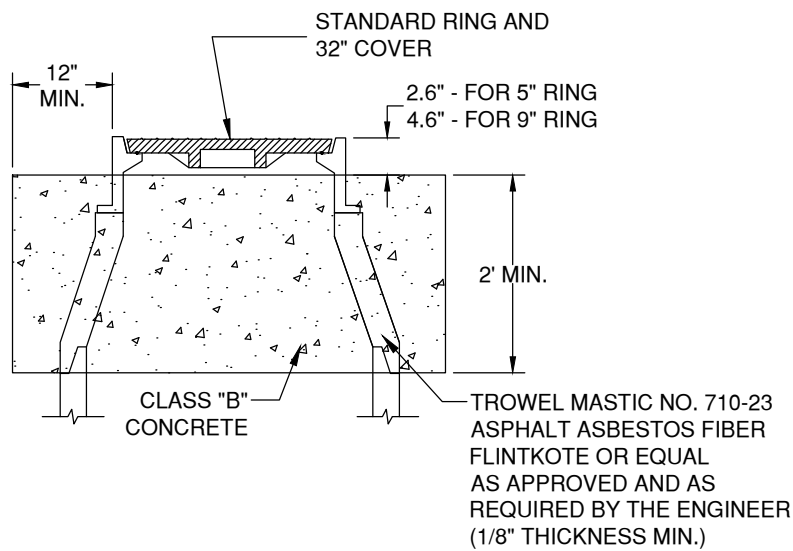
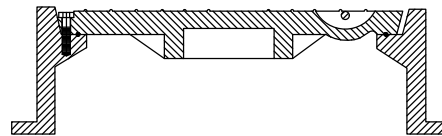
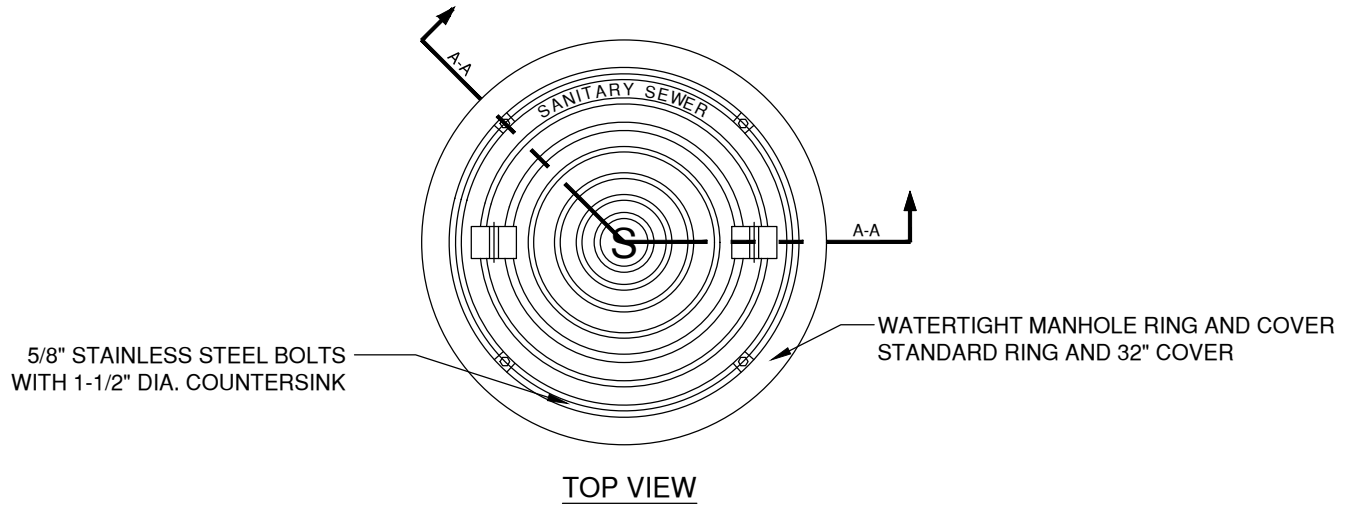
PROPERTY OF 	DTL #327 WASTEWATER MANHOLE ON CAST IN PLACE FOUNDATION	 M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
			08/17/21	
			SHEET 1 OF 1	



SECTION A-A

*CONTRACTOR SHALL LEVEL AND PLUMB THE BASE PRIOR TO SETTING THE PRECAST MANHOLE RISER SECTIONS ON THE PRECAST CONCRETE BASE.

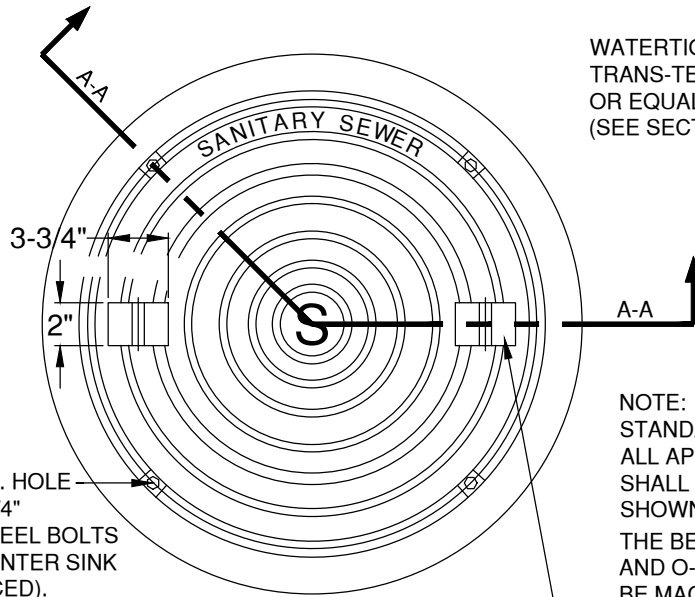
PROPERTY OF 	DTL #328 WASTEWATER MANHOLE ON PRECAST BASE	M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
			08/17/21	
			SHEET 1 OF 1	



ENCASEMENT DETAIL
(ALL MANHOLES)

NOTE:
 MANHOLE RING ENCASEMENT IS REQUIRED ON ALL MANHOLES EXCEPT MANHOLES IN NEW OR EXISTING STREETS WHERE AS DIRECTED BY THE ENGINEER.

WATERTIGHT MANHOLE RING AND COVER.
 TRANS-TEX A-77 O.R.
 OR EQUAL AS SHOWN
 (SEE SECTION "A-A")

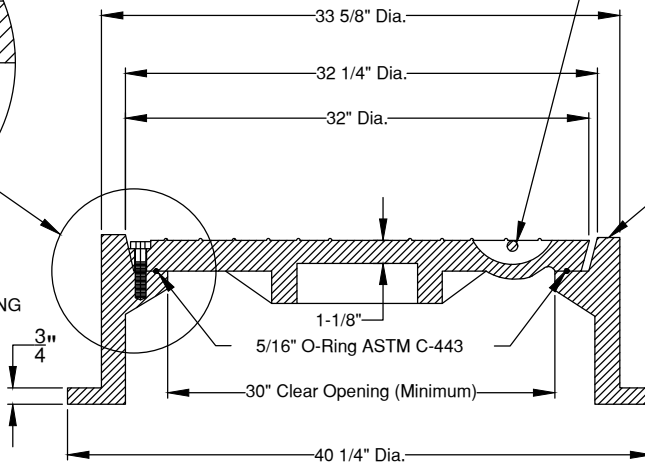
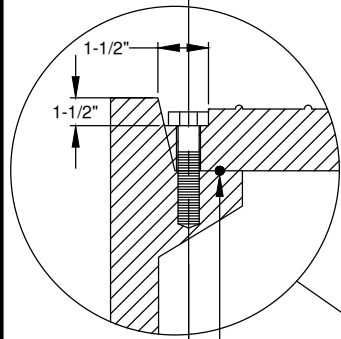


NOTE:
 STANDARD MANHOLE RING AND COVER
 ALL APPLICABLE DIMENSIONS
 SHALL CONFORM TO THE DIMENSIONS
 SHOWN HERE.
 THE BEARING SURFACES
 AND O-RING GROOVE SHALL
 BE MACHINED GROUND.

(4 EA.) 3/4" DIA. HOLE
 FOR 5/8" X 1-3/4"
 STAINLESS STEEL BOLTS
 1-1/2" SQ. COUNTER SINK
 (EVENLY SPACED).

TOP VIEW

PICK SLOT (1-1/8" VERTICAL CLEAR SPACE)
 WITH LIFTING BAR (1" DIAMETER).



MANUFACTURER'S
 IDENTIFICATION
 ON THIS SURFACE

NOTE:
 DEPTH AND GRADE OF SERVICE
 LATERALS AS SHOWN, ARE TYPICAL
 ONLY. ACTUAL DEPTH, ALIGNMENT
 AND GRADE OF SERVICE LATERALS
 SHALL BE AS DETERMINED BY THE
 ENGINEER BASED ON ELEVATIONS
 OF THE SEWER MAIN, STREET,
 NATURAL GROUND AND BUILDING TO
 BE SERVICED.

Section "A-A"

NOTE:
 ALL DIMENSIONS MAY VARY EXCEPT THE DIAMETER OF THE LID, AND THE DIAMETER
 OF THE CENTER LINE OF THE BOLT HOLES, AND THE MINIMUM DIAMETER OF THE CLEAR
 OPENING. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 400 LBS.

MANHOLE RING & COVER DETAIL



DTL #329
 MANHOLE RING &
 ENCASEMENT DETAIL



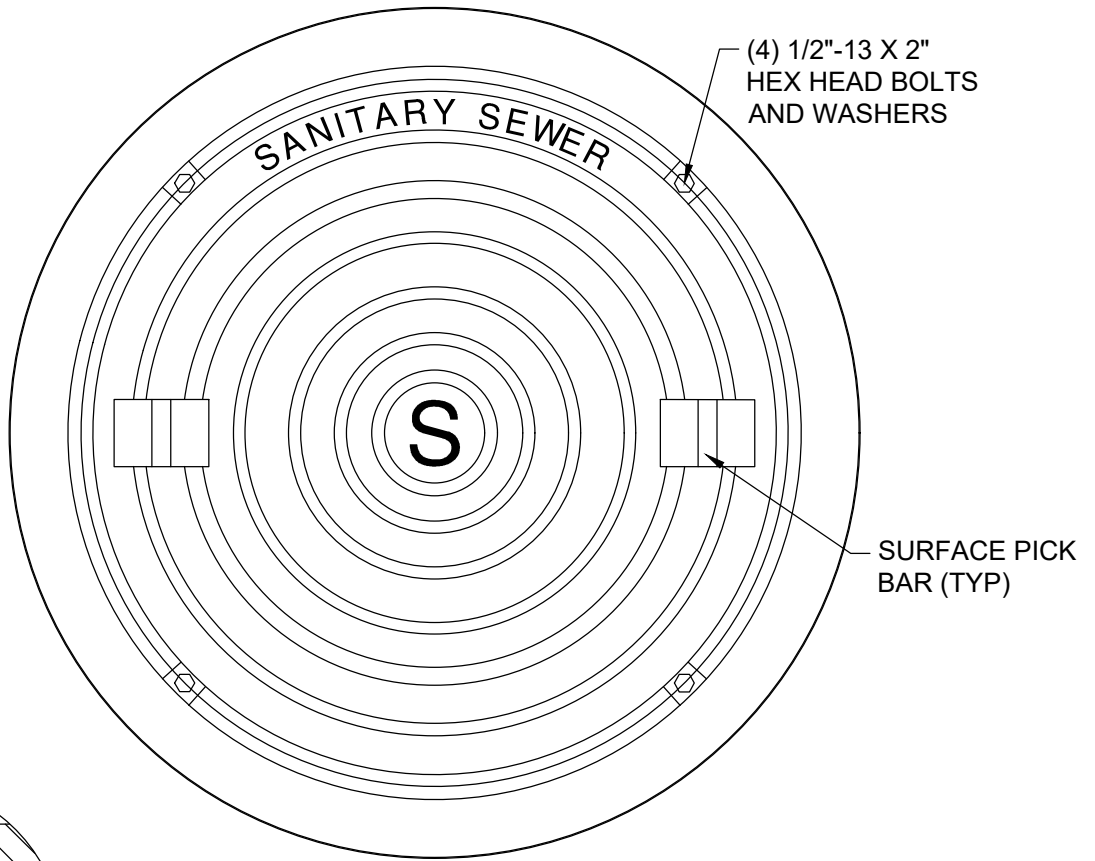
APPROVED

REVISION

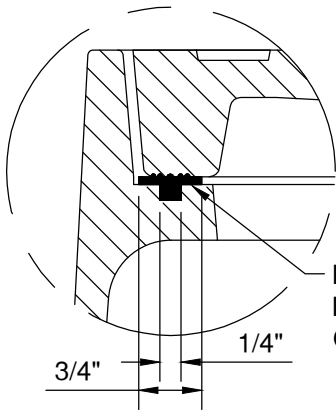
12/06/10

SHEET

2 OF 2

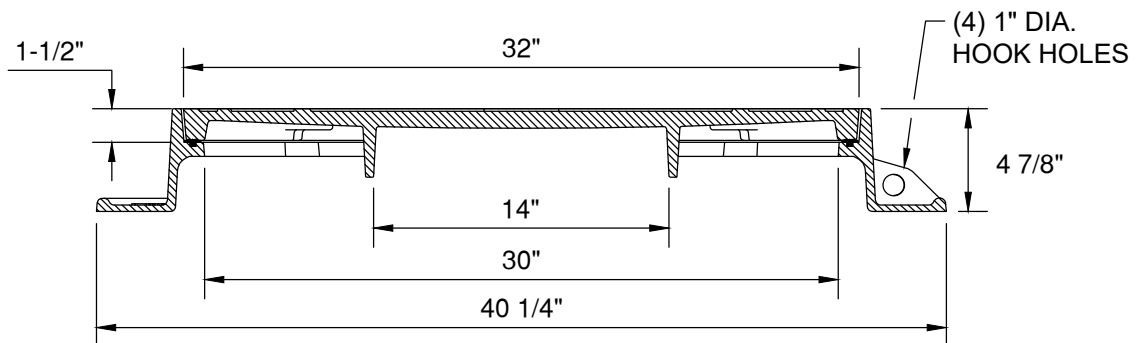


PLAN VIEW



GASKET DETAIL

MACHINE GROOVE IN
 FRAME SEAT FOR
 OIL-RESISTANT GASKET



SECTION VIEW

MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B



DTL #331
 SANITARY SEWER
 MANHOLE COVER

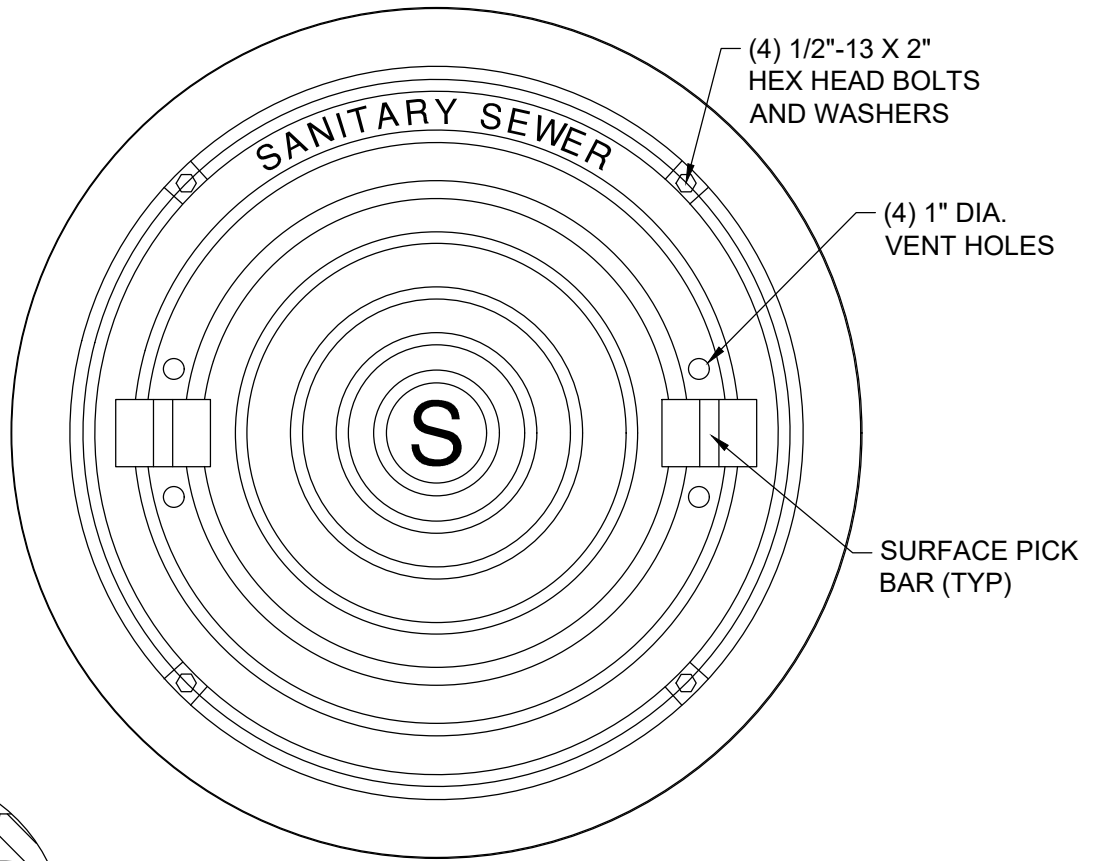


APPROVED	REVISION
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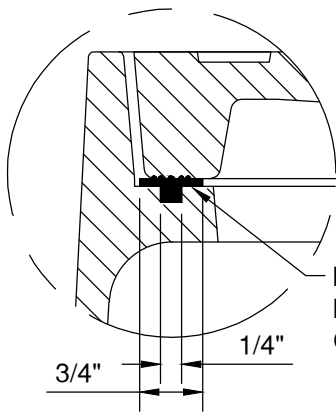
08/17/21	
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SHEET

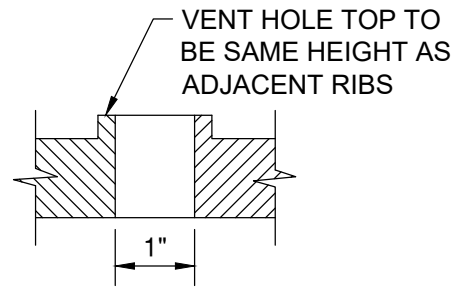
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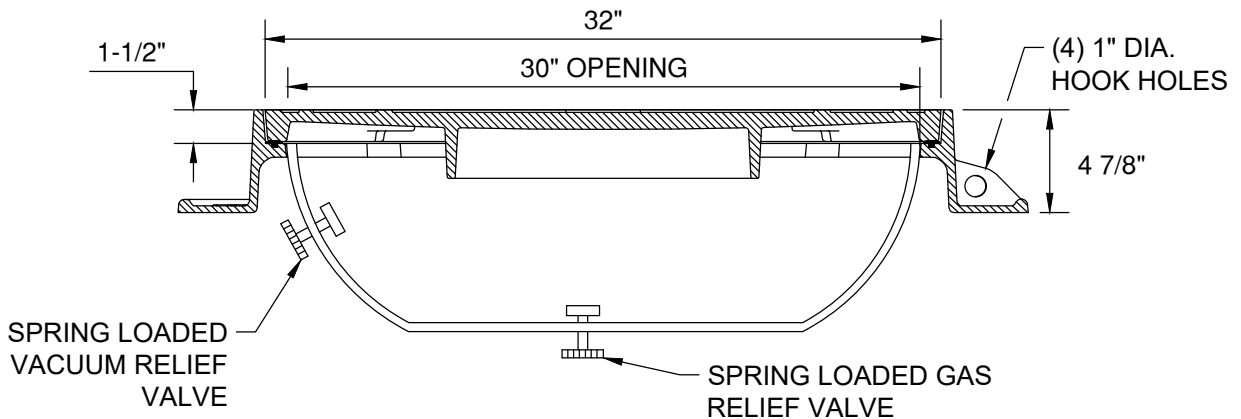
PLAN VIEW



GASKET DETAIL



VENT HOLE DETAIL



SECTION VIEW

MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B



DTL #334
 VENTED SANITARY SEWER
 MANHOLE COVER

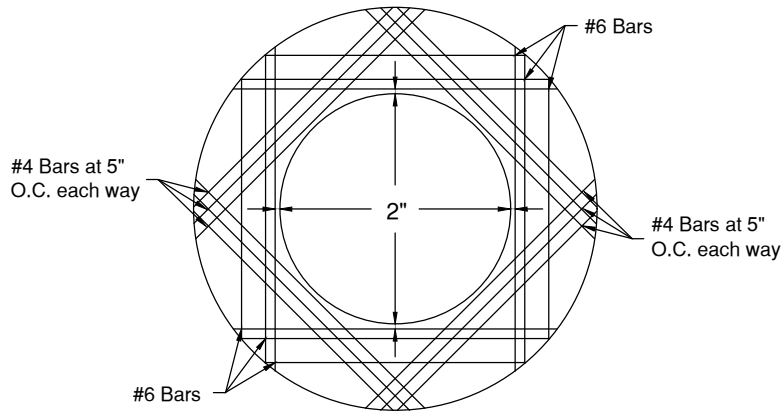


APPROVED	REVISION
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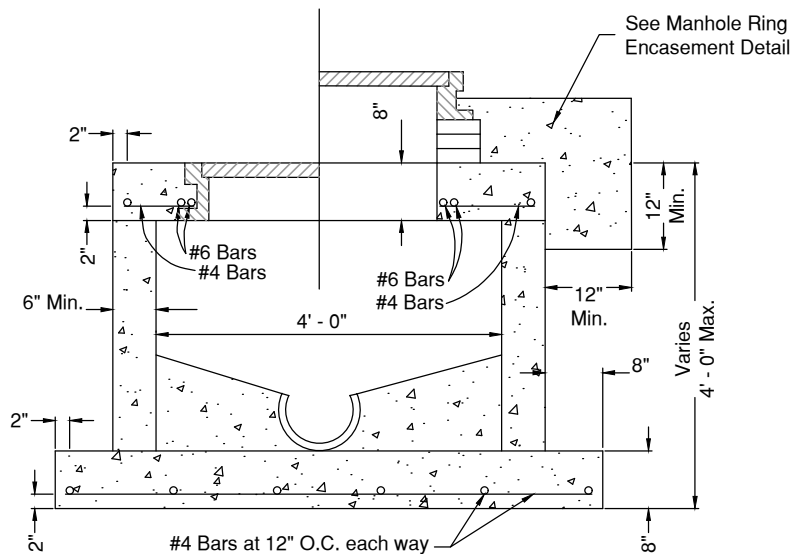
08/17/21	
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SHEET

1 OF 1



TOP SLAB



**SHALLOW MANHOLE
 PRECAST OR MONOLITHIC**

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	---

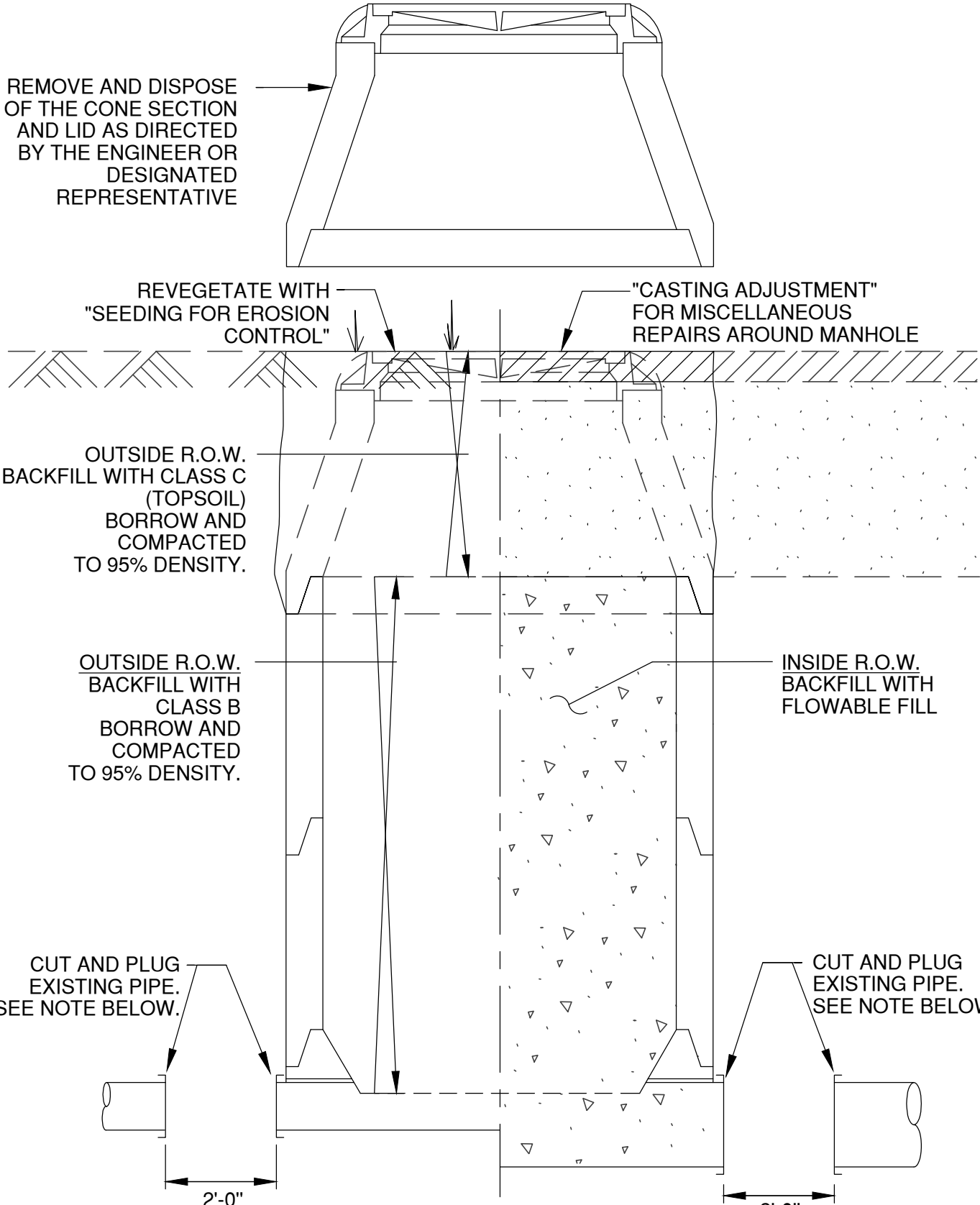
* MINIMUM LENGTH

Note:
 PVC pipes and fittings six inches (6") to fifteen inches (15") in diameter shall conform to ASTM D-3034.
 PVC pipes and fittings eighteen inches (18") to twenty-seven (27") in diameter shall conform to ASTM F-679.



This information is provided as a reference. All deflection testing shall be done in accordance with TCEQ Chapter 317.

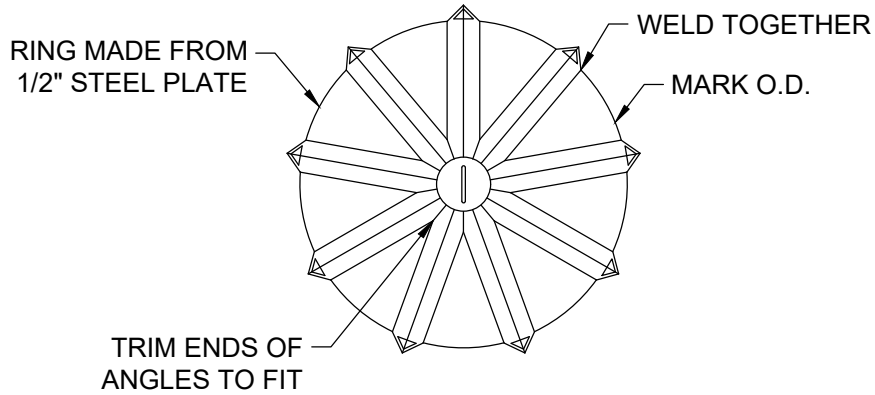
CHART

PROPERTY OF 	DTL #335	M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
	SHALLOW MANHOLE: PRECAST OR MONOLITHIC, TOP SLAB & CHART		05/02/03	
	SHEET 1 OF 1			



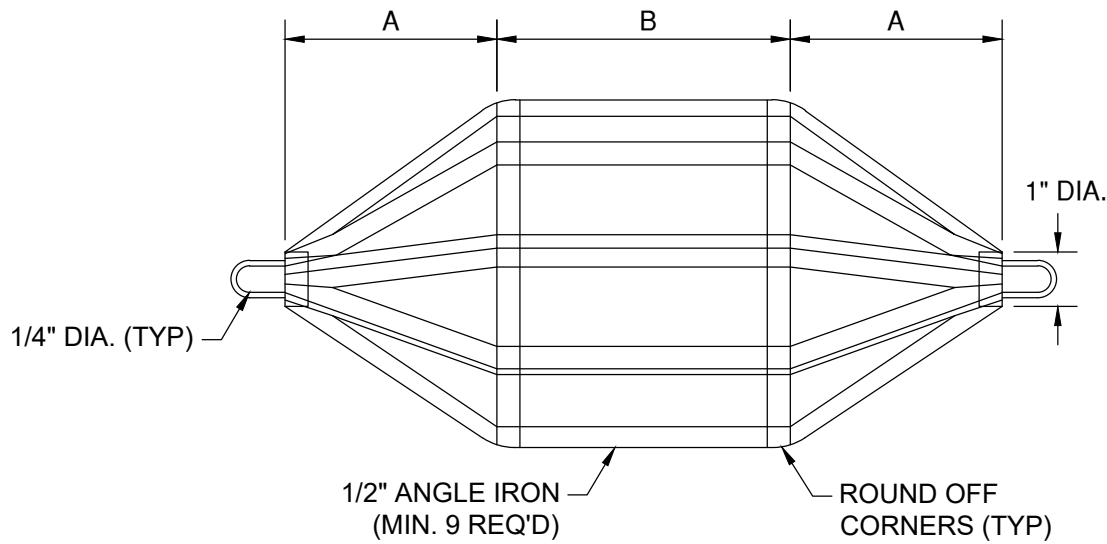
NOTE:
 THE PLUG SHOULD BE COMPOSED OF A MATERIAL SIMILAR TO THE EXISTING PIPE AS INSTRUCTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.

PROPERTY OF 	DTL #340 ABANDONED MANHOLE	 M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
				04/24/03
			SHEET 1 OF 1	



END VIEW

DIMENSIONS
 A - 67% OF PIPE I.D.
 B - 75% OF PIPE I.D.





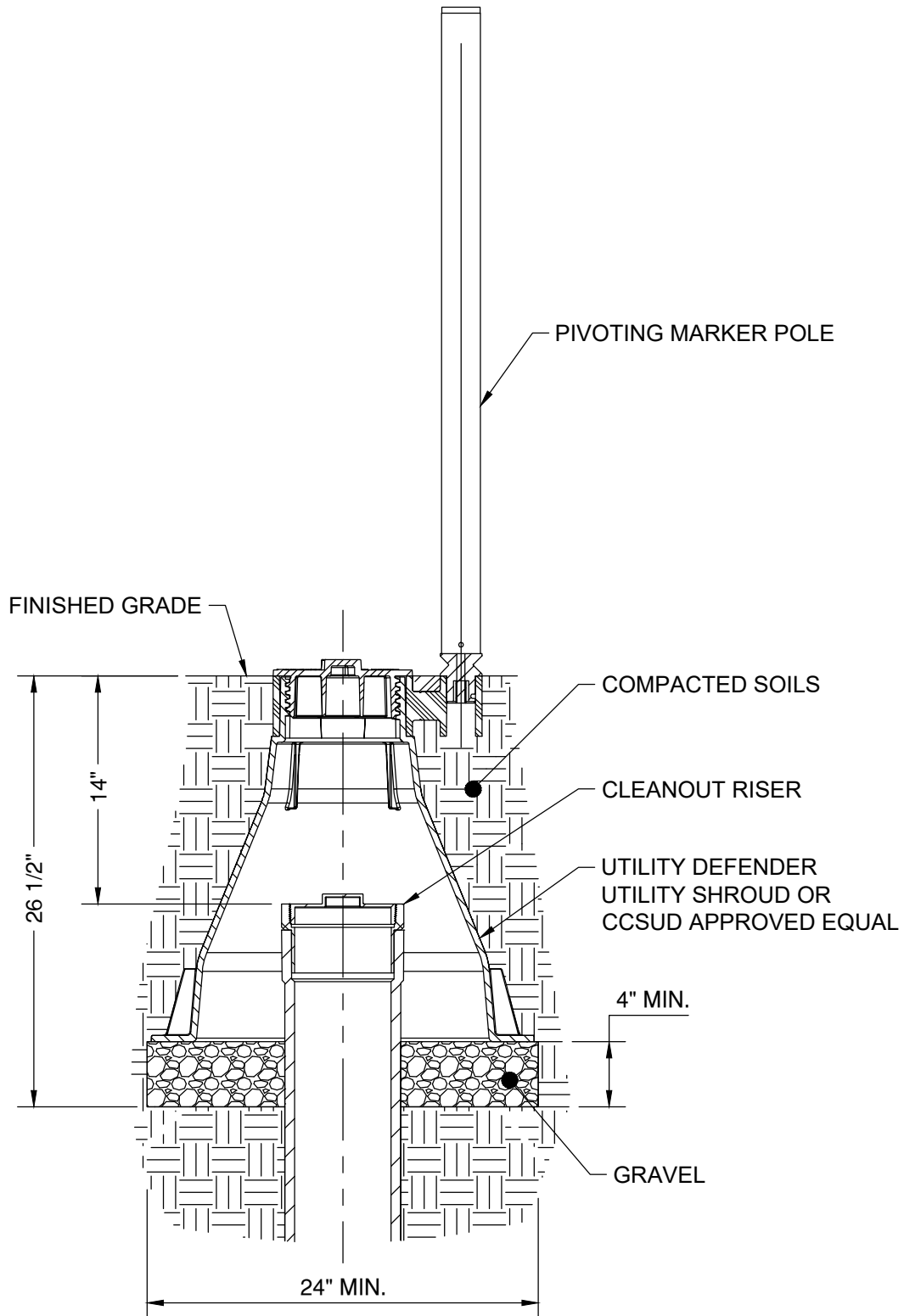
SIDE OR TOP VIEW

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.

PROPERTY OF 	DTL #350 GO, NO GO DEFLECTION TESTING MANDREL	 M&S ENGINEERING ELECTRICAL CIVIL MEP <small>TXENG FIRM # F-1394 TBPELS FIRM #10169800 WWW.MSENGR.COM (830) 228-5446</small>	APPROVED	REVISION
			08/17/21	
			SHEET 1 OF 1	



DTL #360
 UTILITY SHROUD FOR SEWER
 CLEANOUT ASSEMBLY



APPROVED	REVISION
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08/17/21	
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SHEET

1 OF 1