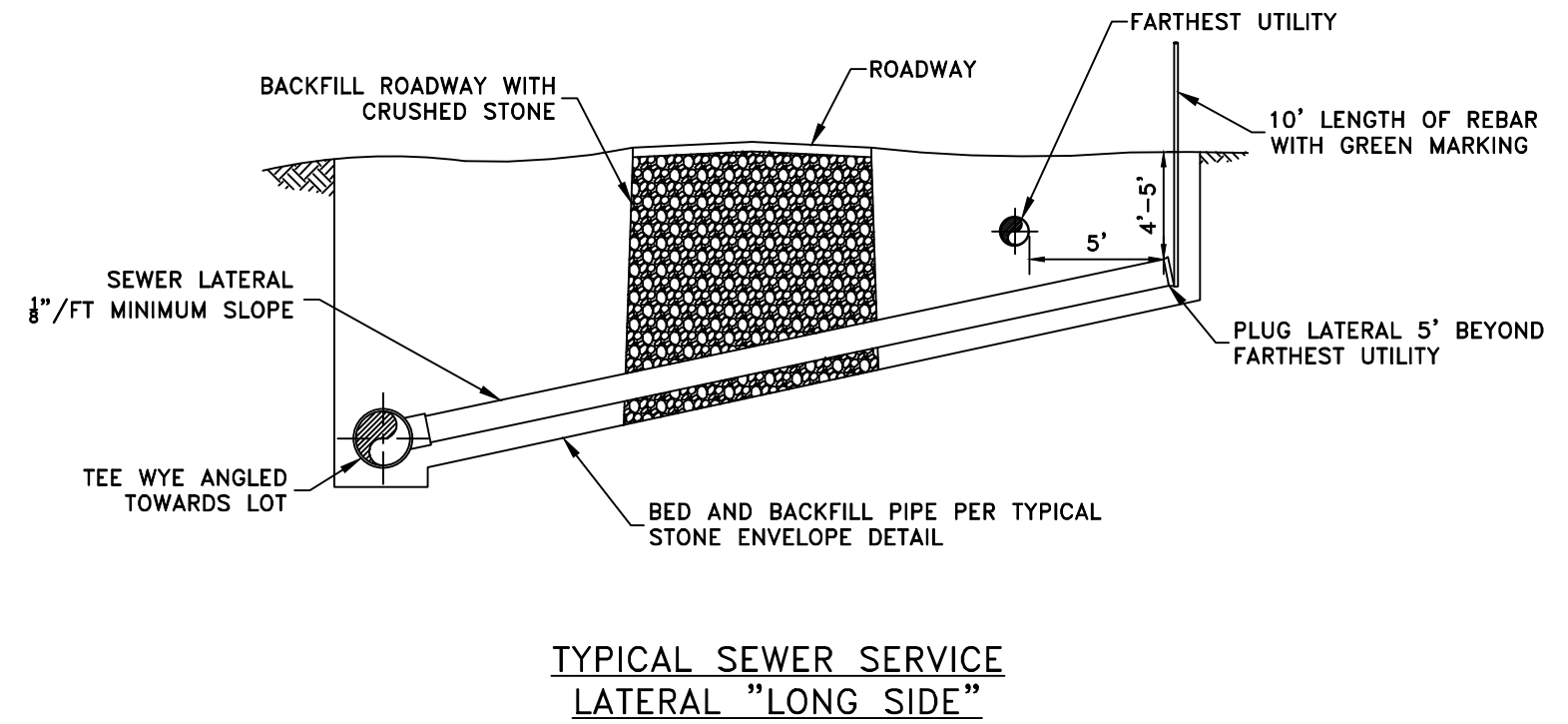
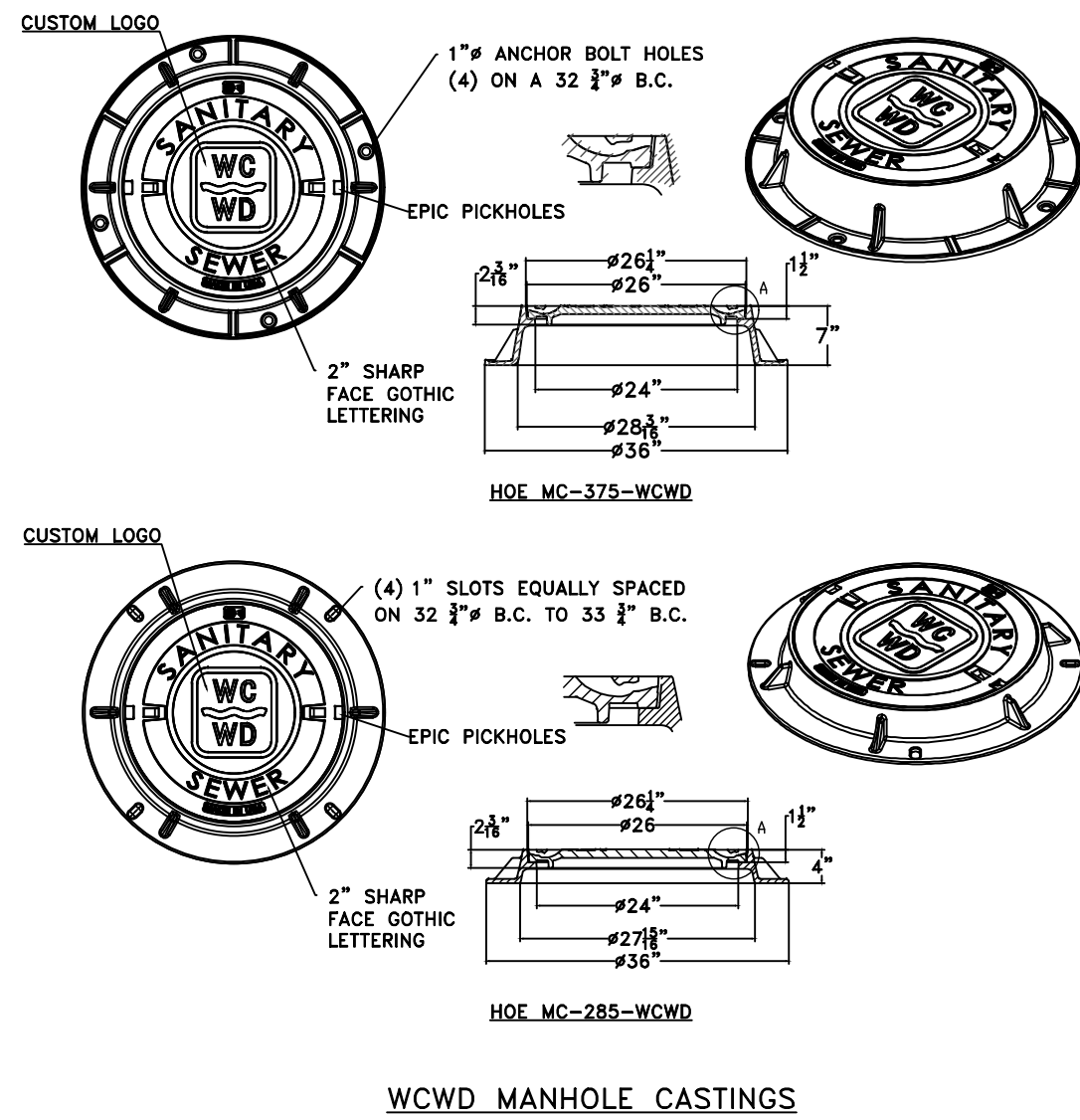
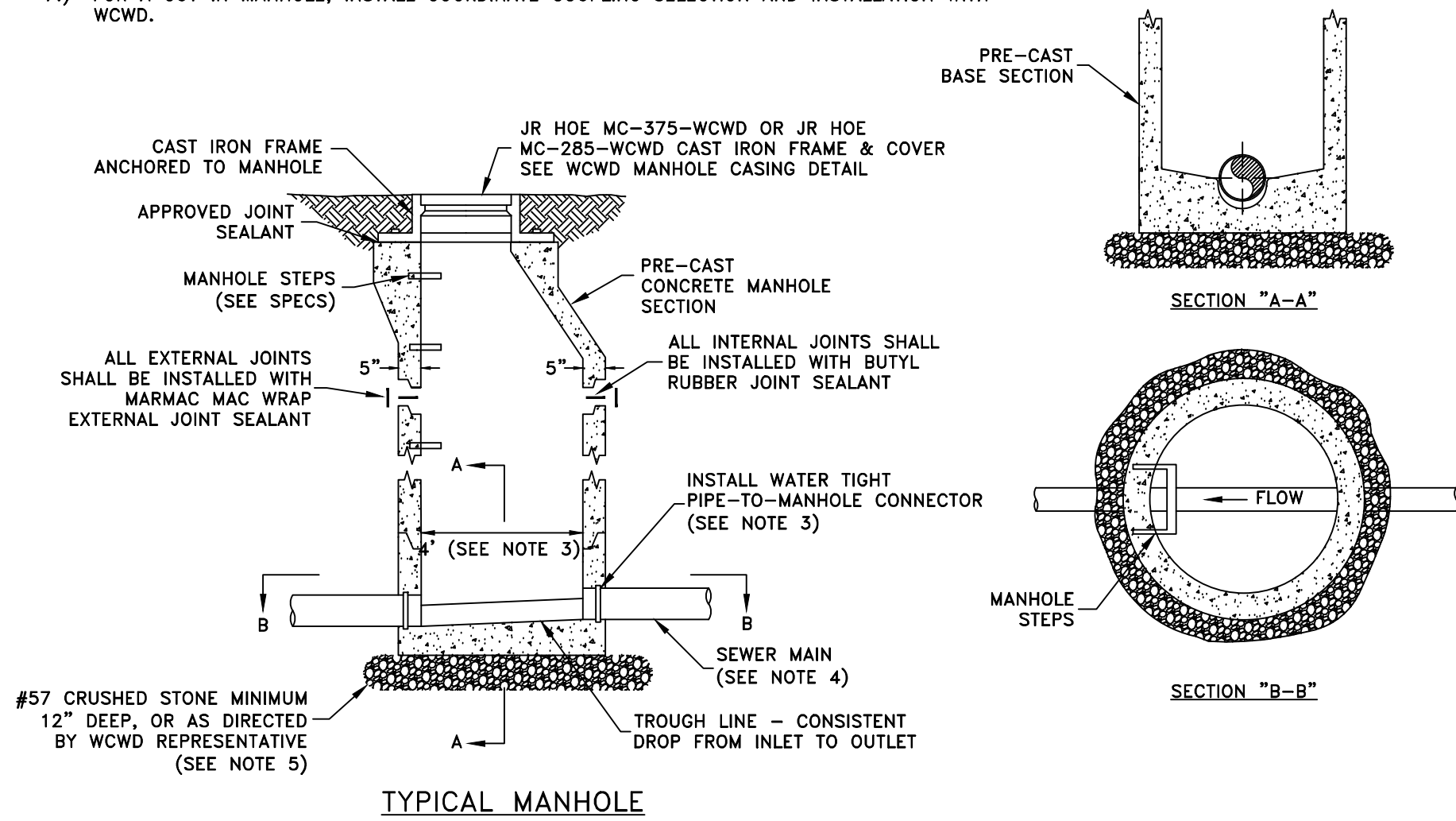
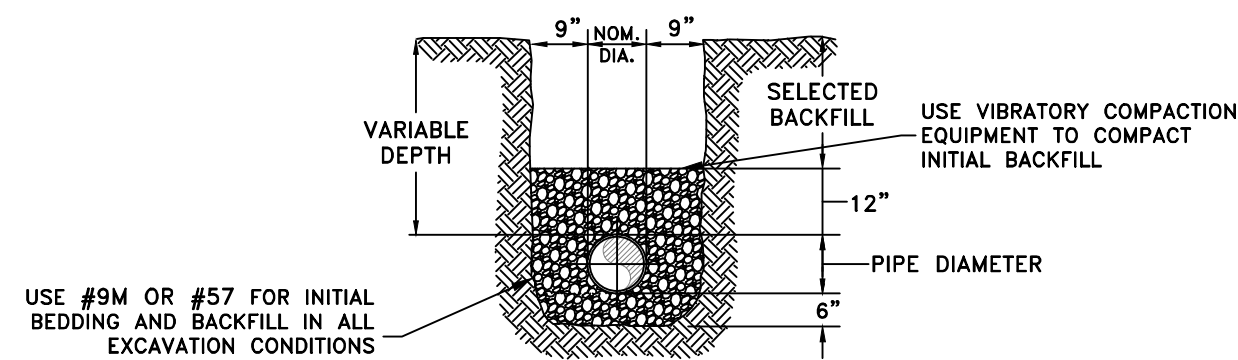


- NOTES:
- 1.) WHILE INSTALLING NEW SEWER MAINS, THE PROPOSED SEWER SHALL REMAINED PLUGGED TO PREVENT INFILTRATION TO EXISTING SEWER UNTIL ACCEPTED BY WCWD.
 - 2.) NO MORE THAN TWO CONCRETE GRADE RINGS SHALL BE USED UNDER CAST IRON FRAME.
 - 3.) INSTALL A-LOK PREMIUM GASKETS ON NEW CONSTRUCTION. INSTALL FLEXIBLE PIPE-TO-MANHOLE CONNECTOR WITH STAINLESS STEEL WEDGE STYLE BAND WHEN TYING TO EXISTING MANHOLES.
 - 4.) FOR SEWER PIPES LARGER THAN 21" IN DIAMETER, COORDINATE MANHOLE DESIGN WITH WCWD.
 - 5.) IF STRUCTURES ARE PROPOSED TO BE INSTALLED IN DISTURBED SOIL, COORDINATE WITH WCWD FOR DESIGN TO PREVENT SETTLING ISSUES.
 - 6.) IF MANHOLE IS INSTALLED IN A ROADWAY, BACKFILL WITH 100% CRUSHED STONE.
 - 7.) FOR A CUT IN MANHOLE, INSTALL COORDINATE COUPLING SELECTION AND INSTALLATION WITH WCWD.

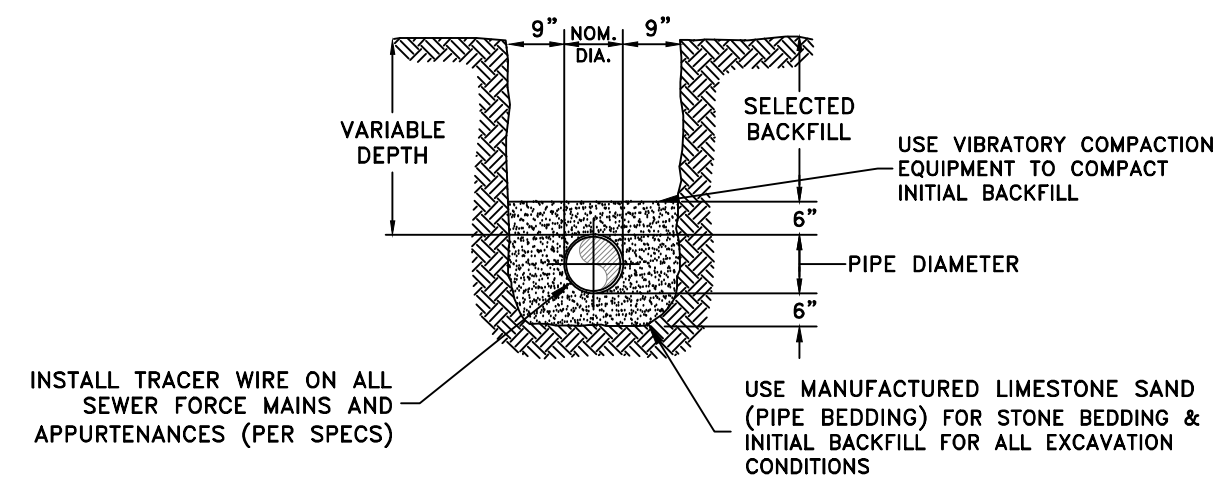


- NOTES:
- 1.) WHEN INSTALLING SEWER MAIN UNDER A ROADWAY, PIPE SHOULD BE BACKFILLED WITH 100% #9M OR #57 STONE TO SUBGRADE OR BY 48" OF #9M OR #57 STONE AND COMPACTED SOIL TO SUBGRADE IF APPROVED BY CCPC.

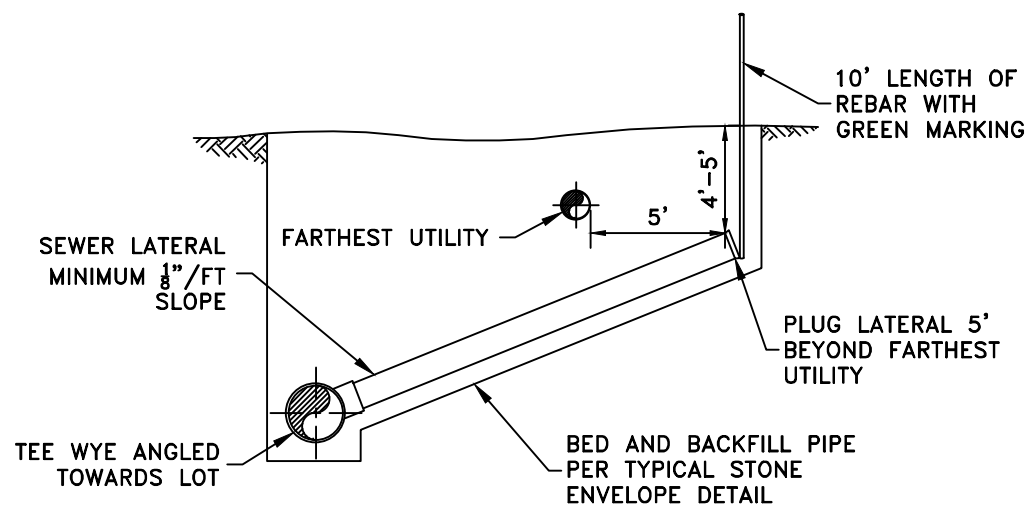


TYPICAL STONE ENVELOPE - SEWER

- NOTES:
- 1.) WHEN INSTALLING FORCE MAIN UNDER A ROADWAY, PIPE SHOULD BE BEDDED AND BACKFILLED WITH 100% #9M OR #57 STONE TO SUBGRADE.

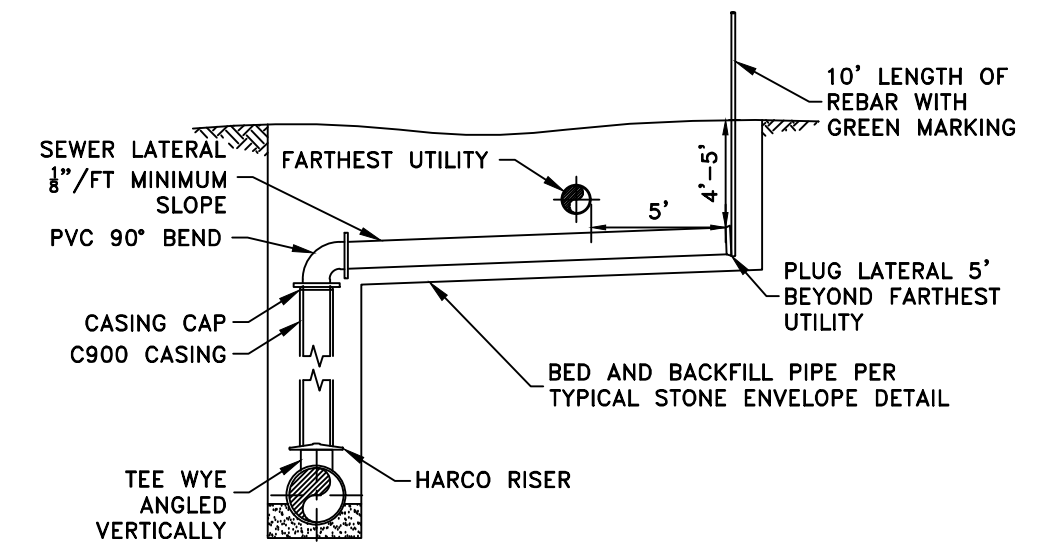


TYPICAL STONE ENVELOPE - FORCE MAIN



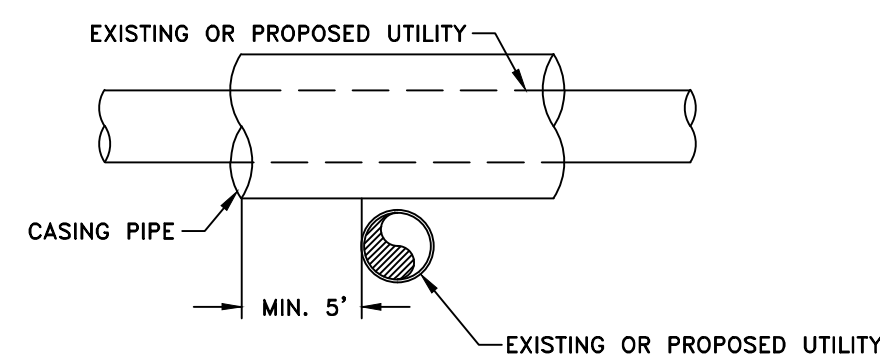
TYPICAL SEWER SERVICE LATERAL "SHORT SIDE"

- NOTES:
- 1.) DEEP SEWER SERVICE CONNECTIONS UTILIZING A HARCO RISER ARE ONLY PERMITTED IF GRAVITY MAIN IS GREATER THAN 20' DEEP, UNLESS APPROVED BY WSB.



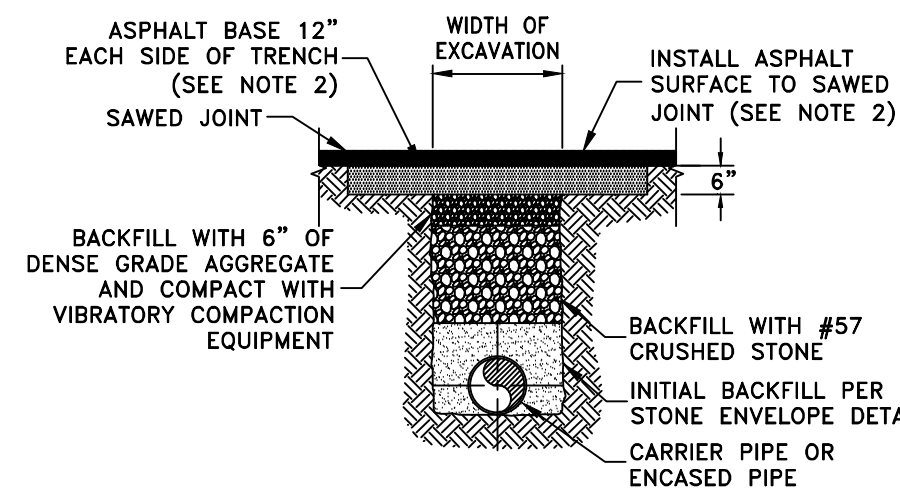
DEEP SEWER SERVICE DETAIL

- NOTES:
- 1.) IF A VERTICAL SEPARATION OF 18" CANNOT BE ACHIEVED BETWEEN ANY TWO UTILITY CROSSINGS DUE TO SITE CONSTRAINTS, STEEL OR PVC CASING SHALL BE UTILIZED DOWN TO A MINIMUM SEPARATION OF 6". THE LENGTH OF CASING SHALL BE ADEQUATE TO SPAN THE TRENCH OF THE UTILITY BEING CROSSED. SPACERS AND END CAPS ARE NOT NECESSARY, BUT THE ENDS OF THE CASING SHOULD BE SEALED WITH SPRAY FOAM.



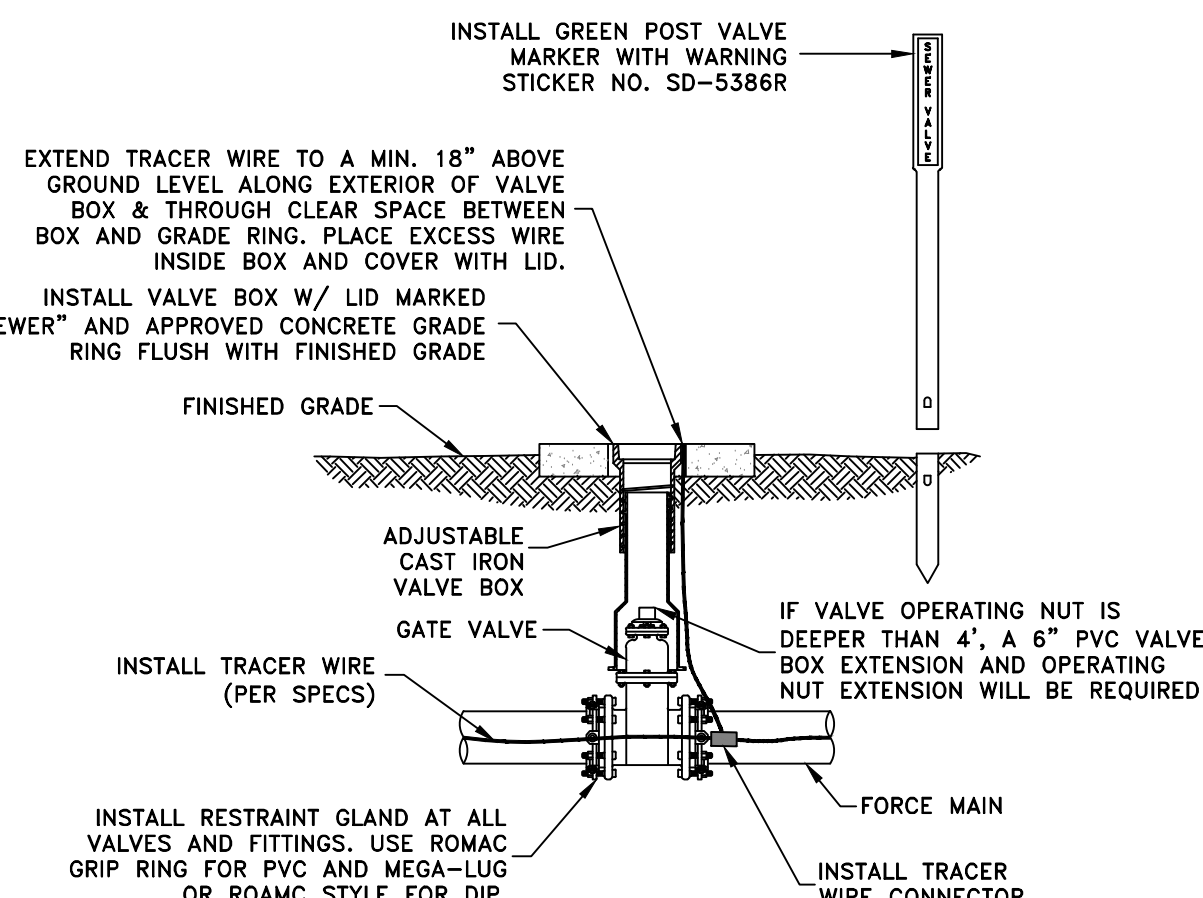
TYPICAL UTILITY CROSSING

- NOTES:
- 1.) FOR BOTH CONCRETE AND ASPHALT PAVEMENT REPAIR, REFERENCE BOWLING GREEN PUBLIC WORKS STREET REPAIR METHOD DETAIL OR COORDINATE WITH GOVERNING ROAD AGENCY.
 - 2.) FOR CONCRETE PAVEMENT, REPLACE WITH A CONTINUOUS SLAB FROM SUB-BASE TO SURFACE

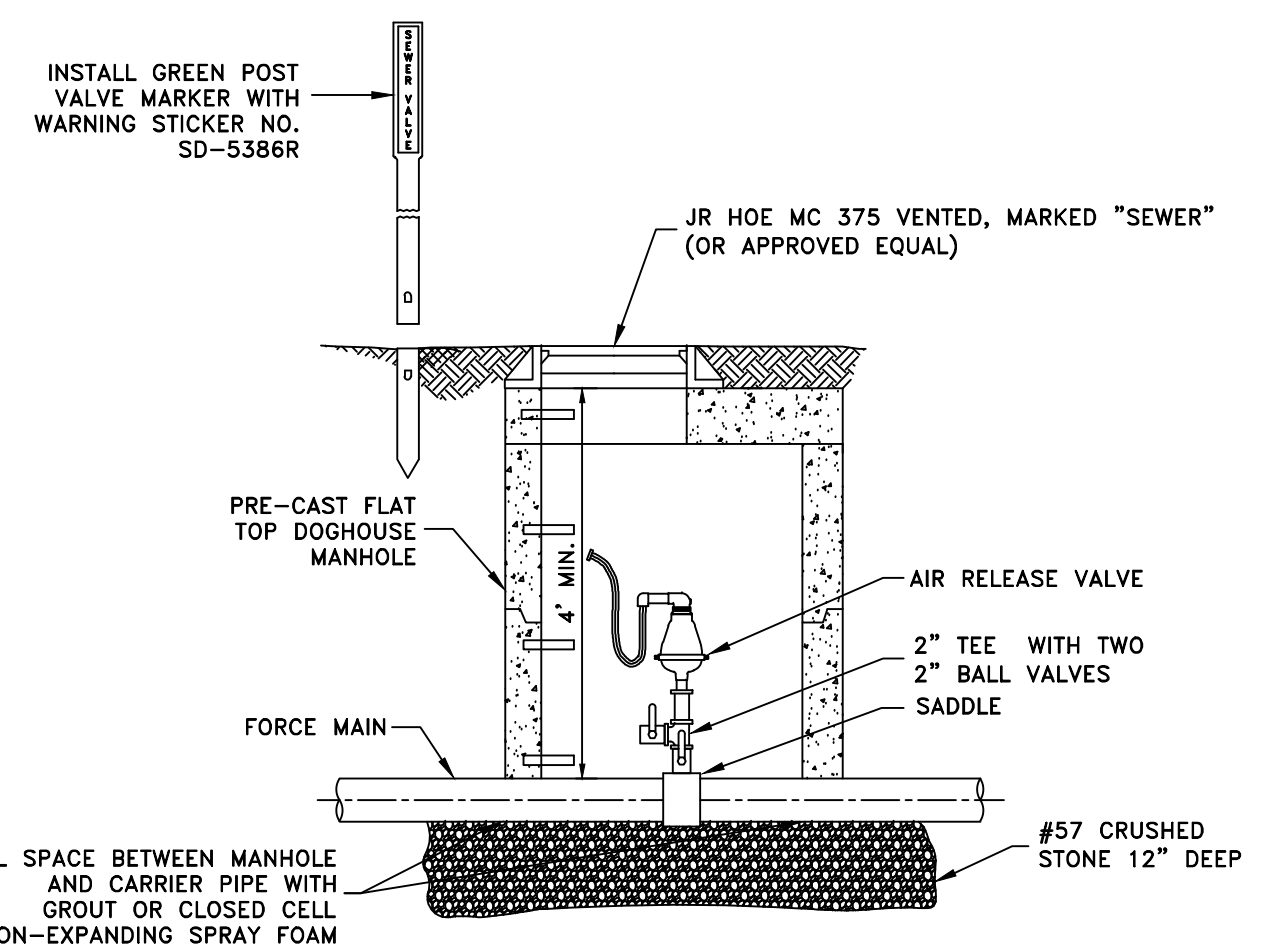


SURFACE RESTORATION
(FOR CROSSING OF ALL STREETS & HIGHWAYS)

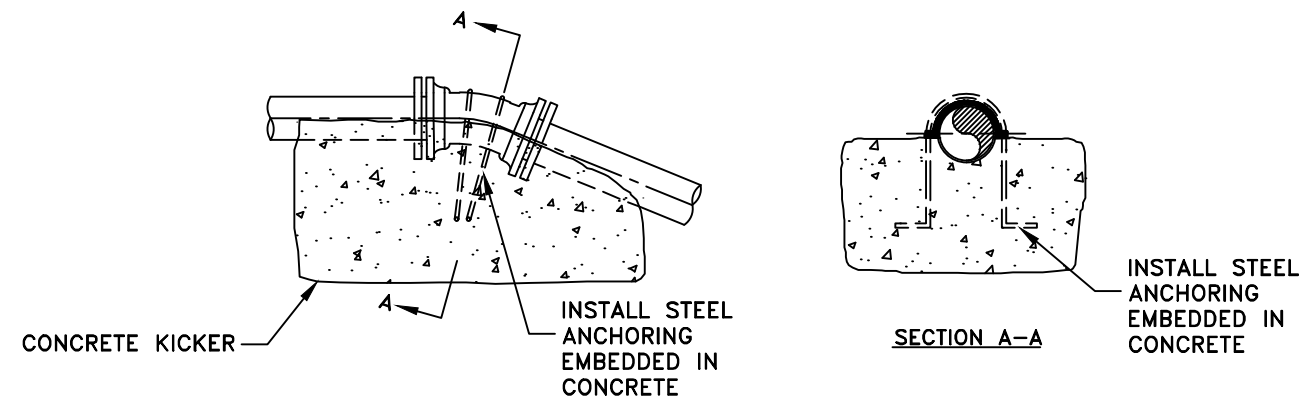
- NOTES:
- 1.) VALVE INSTALLATIONS SHALL BE BEDDED AND BACKFILLED WITH CRUSHED STONE.



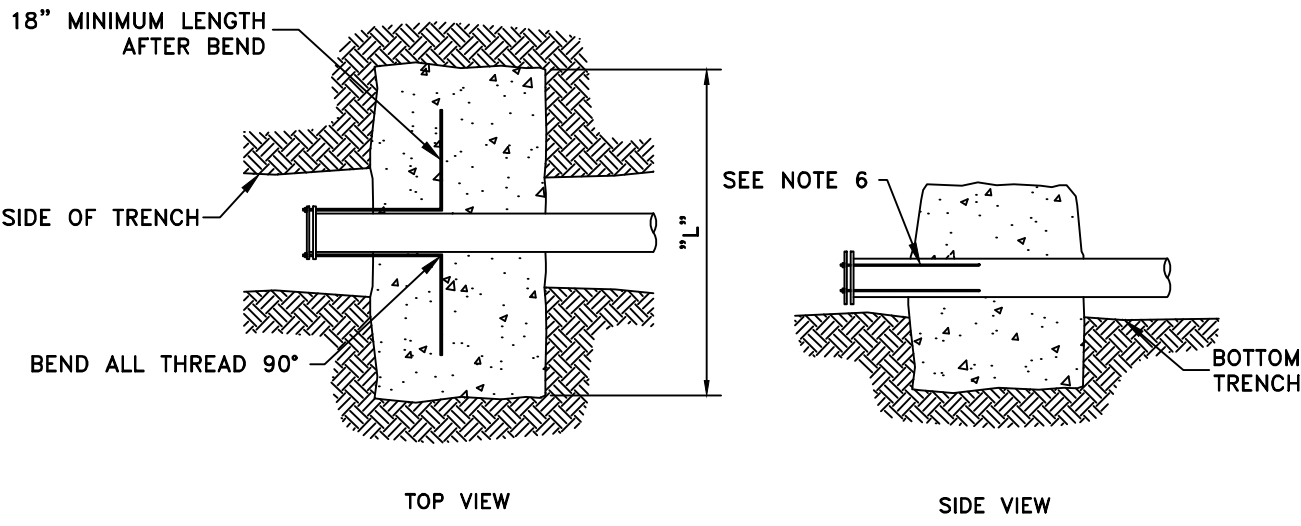
TYPICAL IN-LINE VALVE INSTALLATION



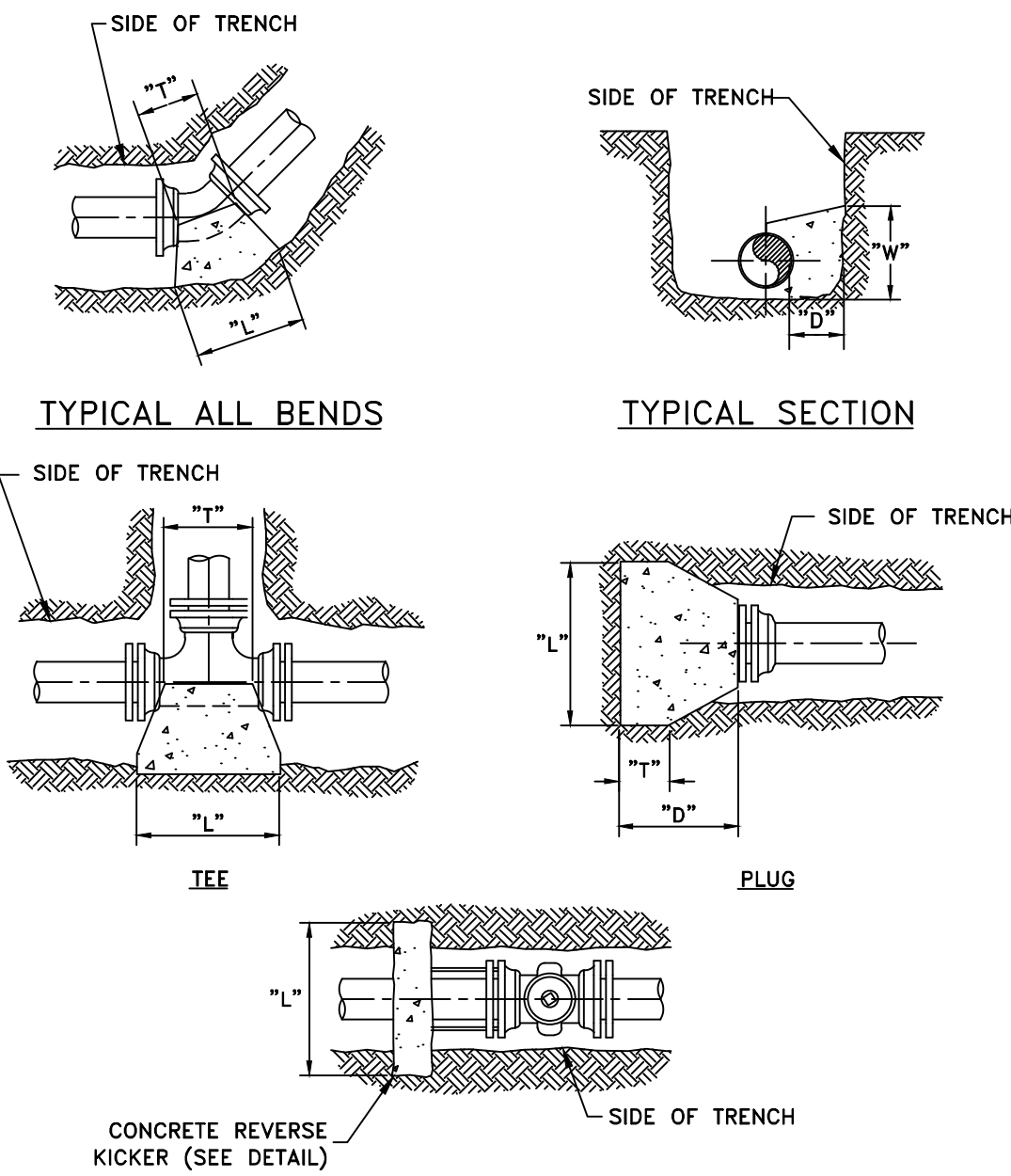
STANDARD AIR RELEASE STATION - FORCE MAIN



VERTICAL BEND PIPE ANCHOR DETAIL



CONCRETE REVERSE KICKER (DEADMAN) DETAIL



VALVES AT END OF LINE

- NOTES:
- 1.) ALL FITTINGS SHALL BE EPOXY COATED
 - 2.) ALL FITTINGS SHALL INCLUDE ROMAC RESTRAINT GLAND AND GRIP RINGS.
 - 3.) CONCRETE THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED EARTH.
 - 4.) PLASTIC BARRIER SHALL BE PLACED BETWEEN ALL CONCRETE AND PIPE AND/OR FITTINGS.
 - 5.) ANCHOR BAR SHALL BE 5/8" MINIMUM DIAMETER.
 - 6.) RODDING FOR A CONCRETE REVERSE KICKER SHALL BE AS FOLLOWS: ≤4" USE 2 RODS, 6"-10" USE 4 RODS & ≥12" PER ENGINEER.
 - 7.) FITTINGS SHALL BE INSTALLED AS REQUIRED PER WCWD INSPECTOR.

90° BENDS													
SIZE	2	4	6	8	10	12	14	16	18	20	24	30	
"D"	6	8	8	10	12	14	22	22	24	24	30	30	
"L"	16	20	24	30	32	34	68	68	80	80	96	120	
"W"	8	10	12	18	22	24	34	34	40	40	48	60	
"T"	10	12	16	20	22	22	38	38	40	40	44	52	

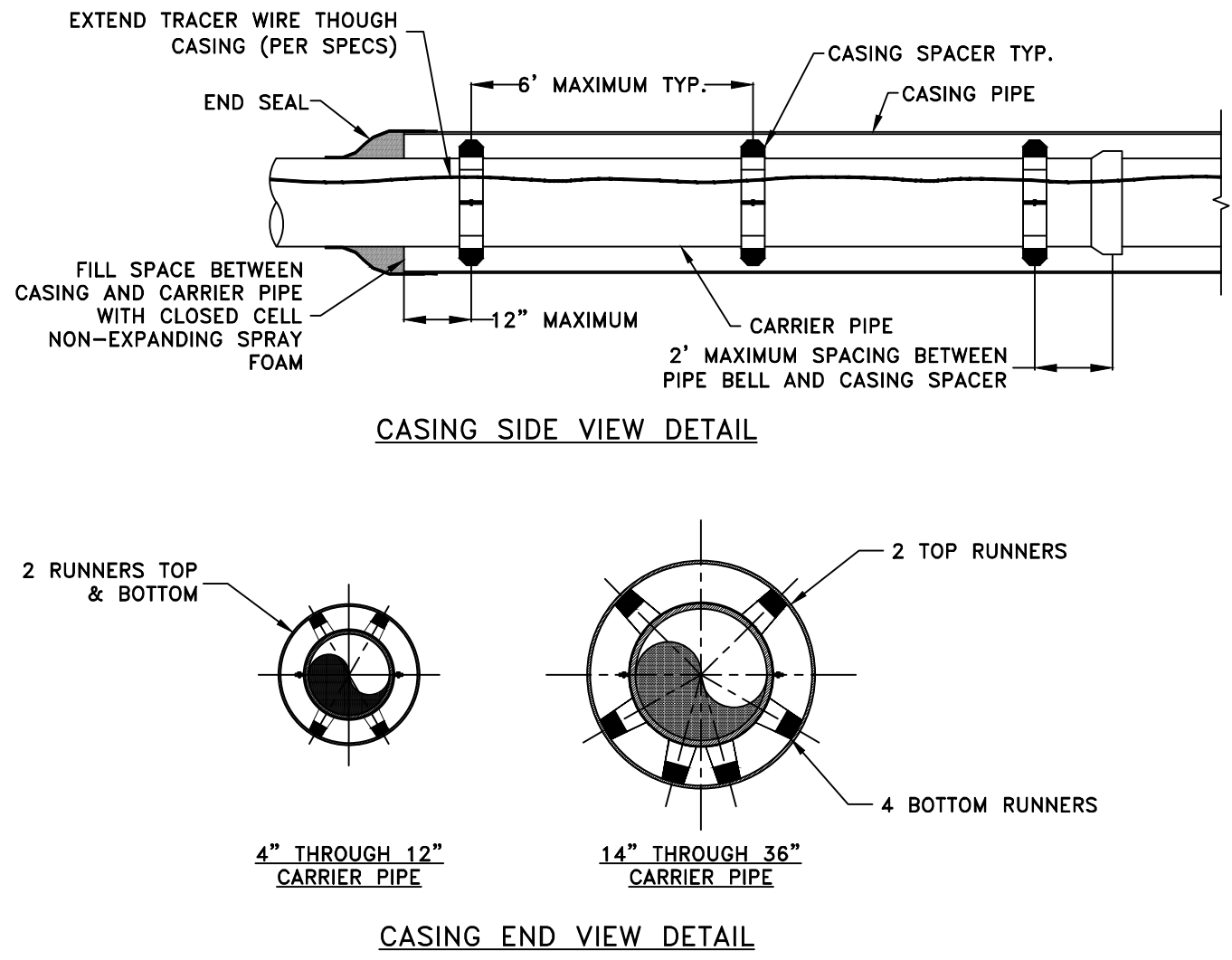
45° BENDS													
SIZE	2	4	6	8	10	12	14	16	18	20	24	30	
"D"	6	6	8	10	12	12	22	22	24	24	30	30	
"L"	14	18	18	22	24	24	51	51	60	60	72	90	
"W"	8	10	12	16	18	18	25	25	29	29	36	44	
"T"	10	12	16	18	18	18	38	38	40	40	44	52	

22 1/2" & 11 1/4" BENDS													
SIZE	2	4	6	8	10	12	14	16	18	20	24	30	
"D"	6	10	14	18	20	20	22	22	24	24	30	30	
"L"	20	24	28	28	28	28	36	36	42	42	54	66	
"W"	18	20	22	24	24	24	18	18	21	21	24	31	
"T"	12	14	16	18	18	18	38	38	40	40	44	52	

TEES, PLUGS & BLOWOFFS													
SIZE	2	4	6	8	10	12	14	16	18	20	24	30	
"D"	12	16	18	24	28	30	30	30	30	30	36		
"L"	12	16	18	24	28	30	60	60	72	72	84	102	
"W"	14	16	18	18	22	24	28	28	32	32	40	51	
"T"	10	10	12	12	12	12	38	38	40	40	44	52	

*ALL DIMENSIONS ARE IN INCHES

MINIMUM CONCRETE BLOCKING FOR PIPE & FITTINGS



CARRIER TYPE AND CASING PIPE SIZES (MIN) IN INCHES													
CARRIER PIPE NOM. DIA. (D1)	4	6	8	10	12	15	16	18	20	21	24	30	
CASING PIPE NOM. DIA. (D2)	12	12	16	16	20	22	24	24	24	30	36	42	
WALL THICKNESS	0.375	0.375	0.375	0.375	0.375	0.500	0.500	0.500	0.500	0.500	0.500	0.625	

CASING SCHEDULE

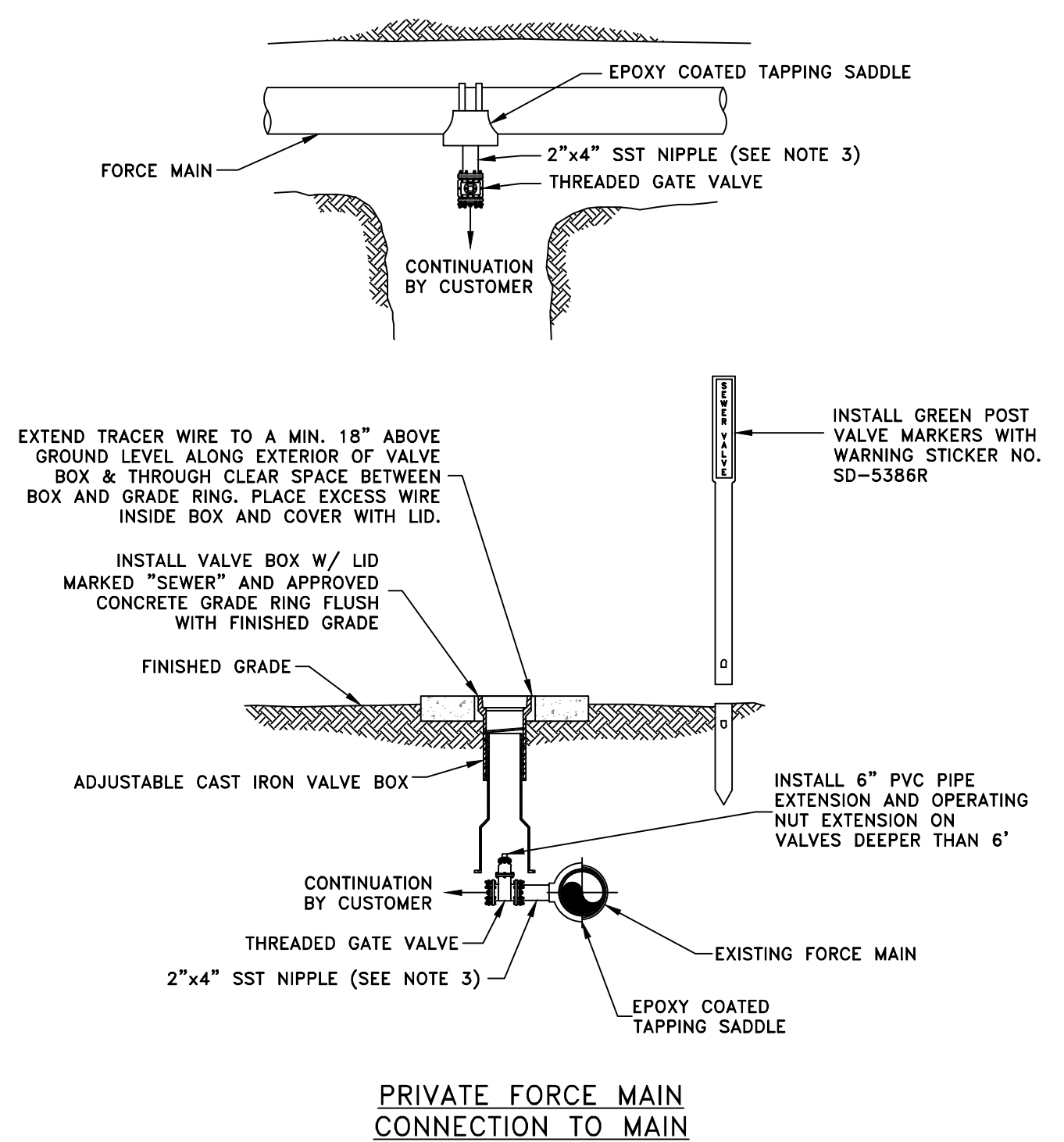
NOTES:

1. MINIMUM COVER AT LOWEST POINT IN RIGHT OF WAY SHOULD BE 4' TO TOP OF CASING WITHIN KYTC AND COUNTY ROADWAY RIGHT-OF-WAY AND 5' TO TOP OF CASING WITHIN RAILROAD RIGHT-OF-WAY.
2. ALL CASINGS SHALL EXTEND THROUGH RIGHT OF WAY.
3. THE INSIDE DIAMETER OF THE CASING PIPE SHALL BE A MINIMUM OF 4 INCHES GREATER THAN THE OUTSIDE DIAMETER OF THE CARRIER PIPE BELL OR COUPLING.
4. FOR CASINGS OVER 50 FEET IN LENGTH ON GRAVITY SEWER, ALL CARRIER PIPE SHALL BE UNRESTRAINED JOINT PVC PIPE. FOR CASINGS OVER 50 FEET IN LENGTH ON FORCE MAIN, ALL CARRIER PIPE SHALL BE RESTRAINED JOINT PVC PIPE.
5. STAINLESS STEEL SPACERS SHALL BE USED FOR ANY PIPE 12" IN DIAMETER AND LARGER.
6. PIPE TO BE USED AS A CASING SHALL CONFORM TO ASTM A252 STANDARD SPECIFICATION FOR WELDED & SEAMLESS STEEL PIPE PILES WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.

TYPICAL CASING DETAIL - SEWER & FORCE MAIN

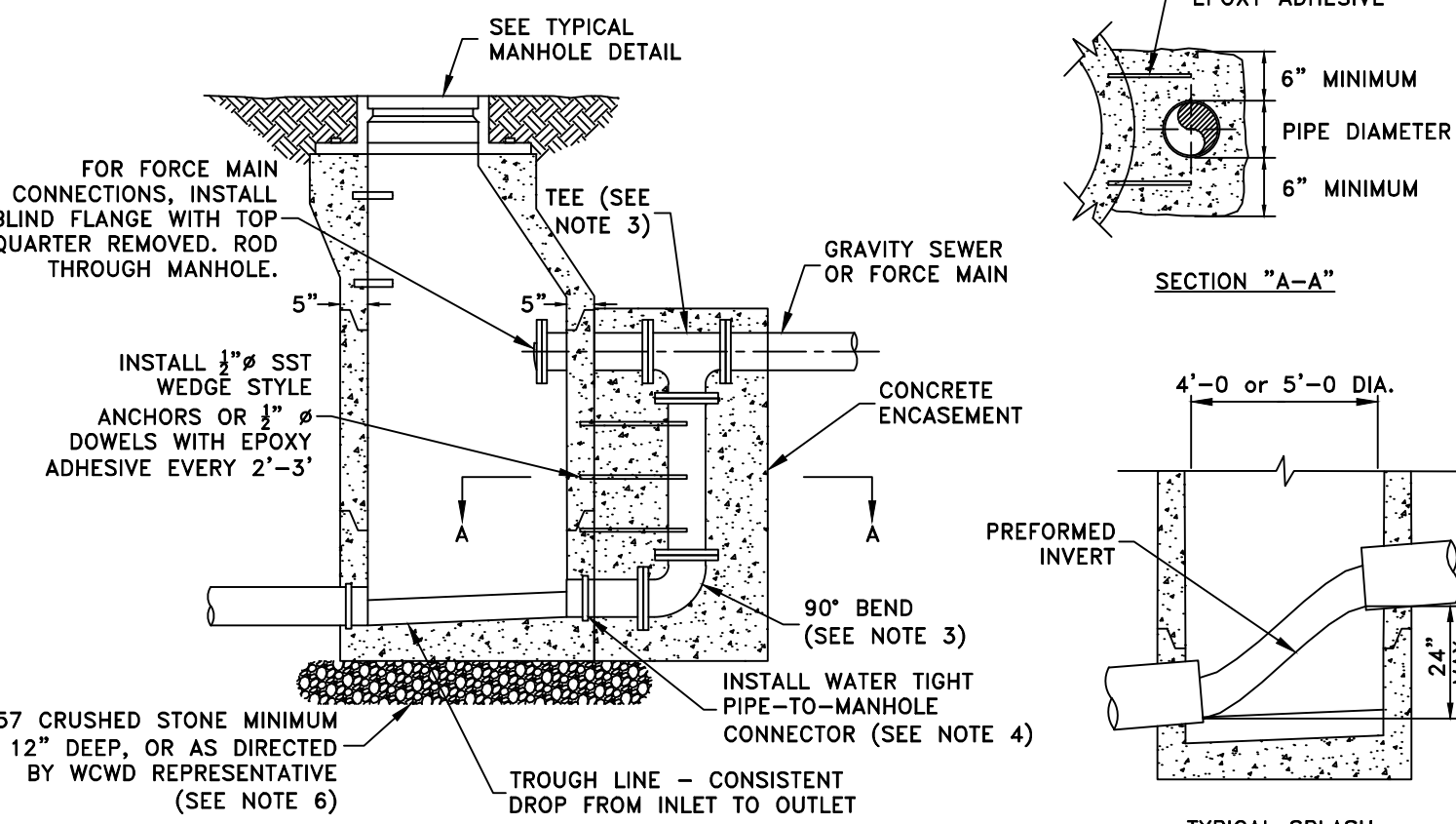
NOTES:

- 1.) VALVE INSTALLATIONS SHALL BE BEDDED AND BACKFILLED WITH CRUSHED STONE.
- 2.) PRIVATE FORCE MAIN PUMP SHALL BE DESIGNED TO OVERCOME PRESSURE NEEDED TO OPEN BACKFLOW PREVENTER.
- 3.) TAPPING SADDLE SIZE IS BASED ON THE DIAMETER OF THE PUBLIC FORCE MAIN, IF PRIVATE FORCE MAIN IS GREATER THAN 2" IN DIAMETER, CONSULT WITH WSB.



NOTES:

- 1.) WHILE INSTALLING NEW SEWER MAINS, THE PROPOSED SEWER SHALL REMAINED PLUGGED TO PREVENT INFILTRATION TO EXISTING SEWER UNTIL ACCEPTED BY WCWD.
- 2.) FOR NEW CONSTRUCTION, ALL PRECAST STRUCTURES SHALL MEET ASTM C-478.
- 3.) FOR FIELD FABRICATED EXTERNAL DROP CONNECTIONS: FORCE MAIN CONNECTIONS: ALL FITTINGS SHALL BE FBE COATED DUCTILE IRON GRAVITY SEWER: GASKETED PVC FITTINGS MAY BE UTILIZED.
- 4.) INSTALL A-LOK PREMIUM GASKETS ON NEW CONSTRUCTION. INSTALL FLEXIBLE PIPE-TO-MANHOLE CONNECTOR WITH STAINLESS STEEL WEDGE STYLE BAND WHEN TYING TO EXISTING MANHOLES.
- 5.) WHEN CONNECTING FORCE MAIN INTO A MANHOLE, CORROSION PREVENTION COATING SHALL BE INSTALLED ON THE CONNECTING MANHOLE AND THE NEXT TWO DOWNSTREAM MANHOLES OR AS DIRECTED BY WCWD.
- 6.) IF STRUCTURES ARE PROPOSED TO BE INSTALLED IN DISTURBED SOIL, COORDINATE WITH WCWD FOR DESIGN TO PREVENT SETTLING ISSUES.
- 7.) IF MANHOLE IS INSTALLED IN A ROADWAY, BACKFILL WITH 100% CRUSHED STONE.

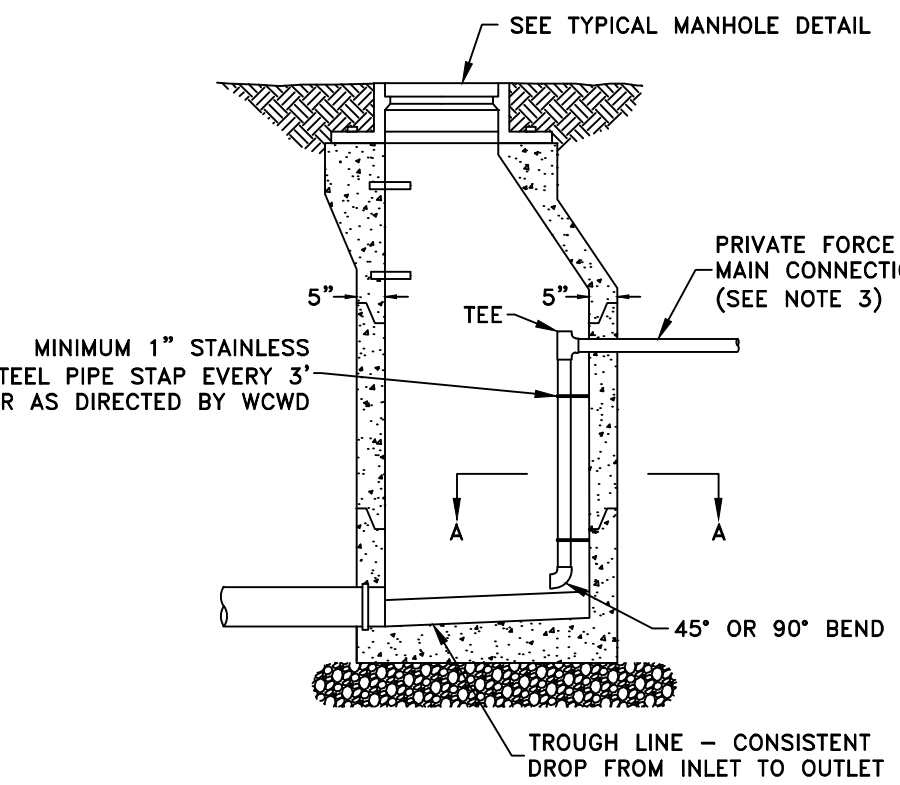


EXTERNAL DROP MANHOLE

(FOR USE WHERE SPECIFIED ON PLANS)

NOTES:

- 1.) WHILE INSTALLING NEW SEWER MAINS, THE PROPOSED SEWER SHALL REMAINED PLUGGED TO PREVENT INFILTRATION TO EXISTING SEWER UNTIL ACCEPTED BY WCWD.
- 2.) INTERNAL DROP CONNECTIONS ARE NOT ALLOWED ON FORCE MAIN DIAMETERS GREATER THAN 2". FOR LARGER FORCE MAIN CONNECTIONS, REFER TO EXTERNAL DROP MANHOLE DETAIL.
- 3.) IF THE MANHOLE BEING CORED IS DOWNSTREAM OF ANOTHER MANHOLE, TIE THE INTERNAL DROP INTO THE STRUCTURE OFFSET RADIALLY FROM THE INLET PIPE AND GROUT BOTTOM OF MANHOLE TO INTERCEPT FLOW.

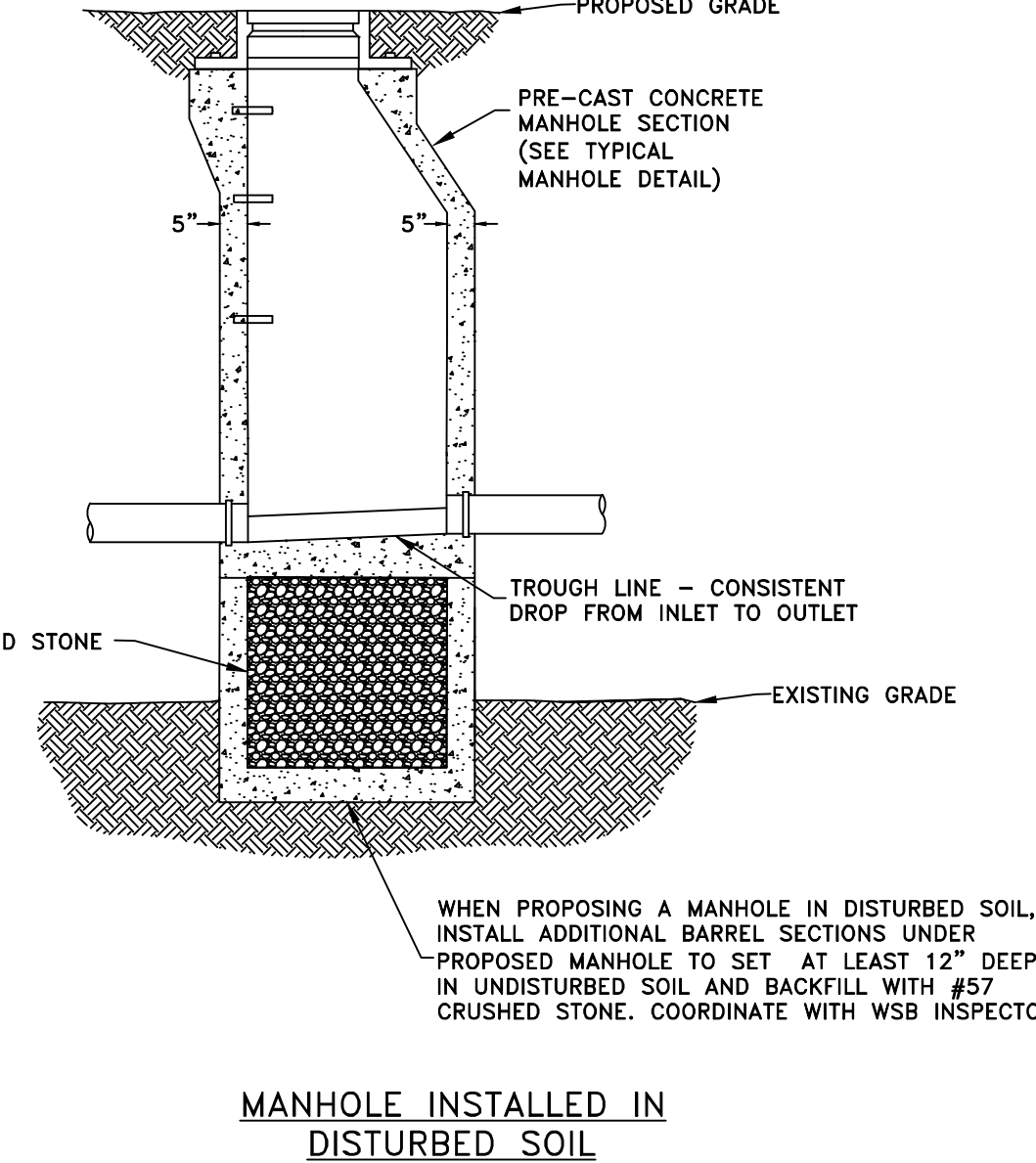


INTERNAL DROP MANHOLE

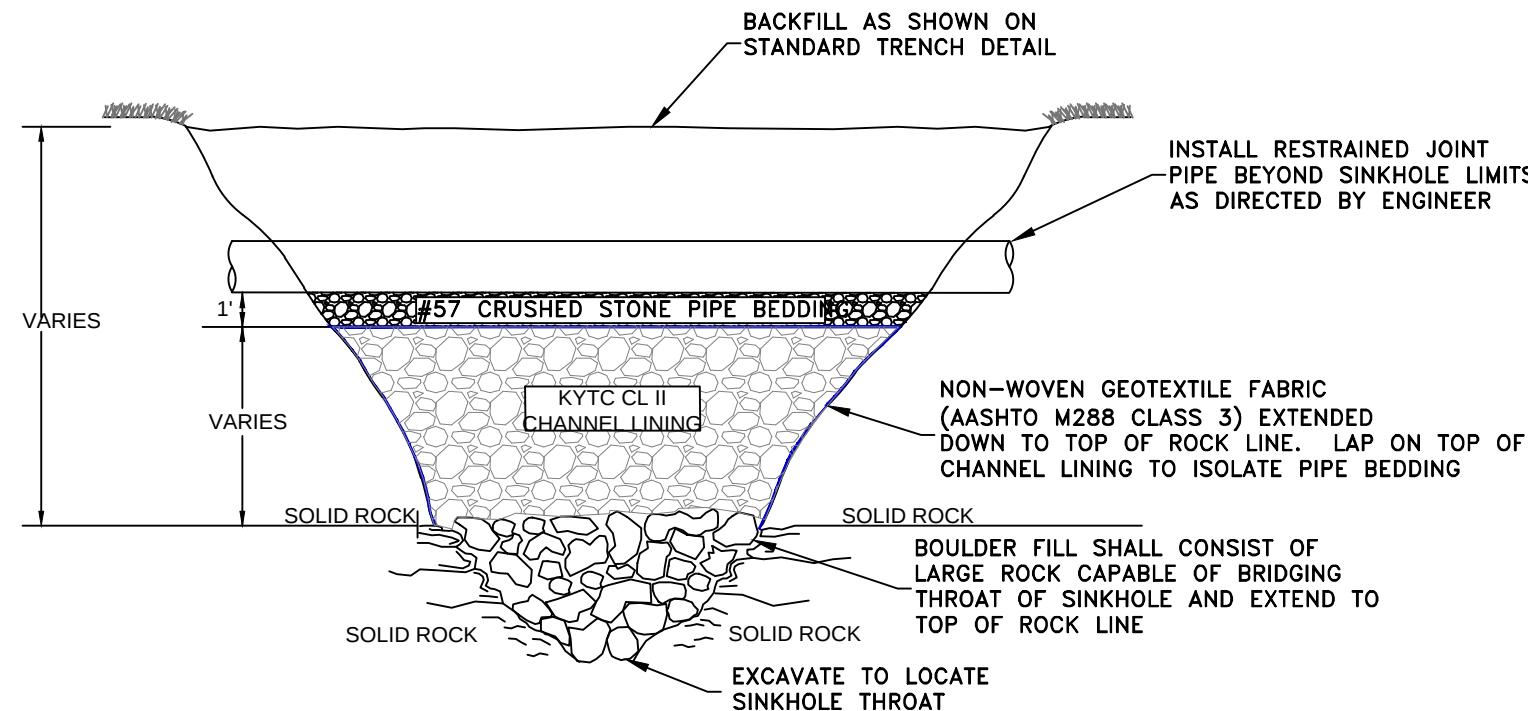
(FOR USE WHERE SPECIFIED ON PLANS)

NOTES:

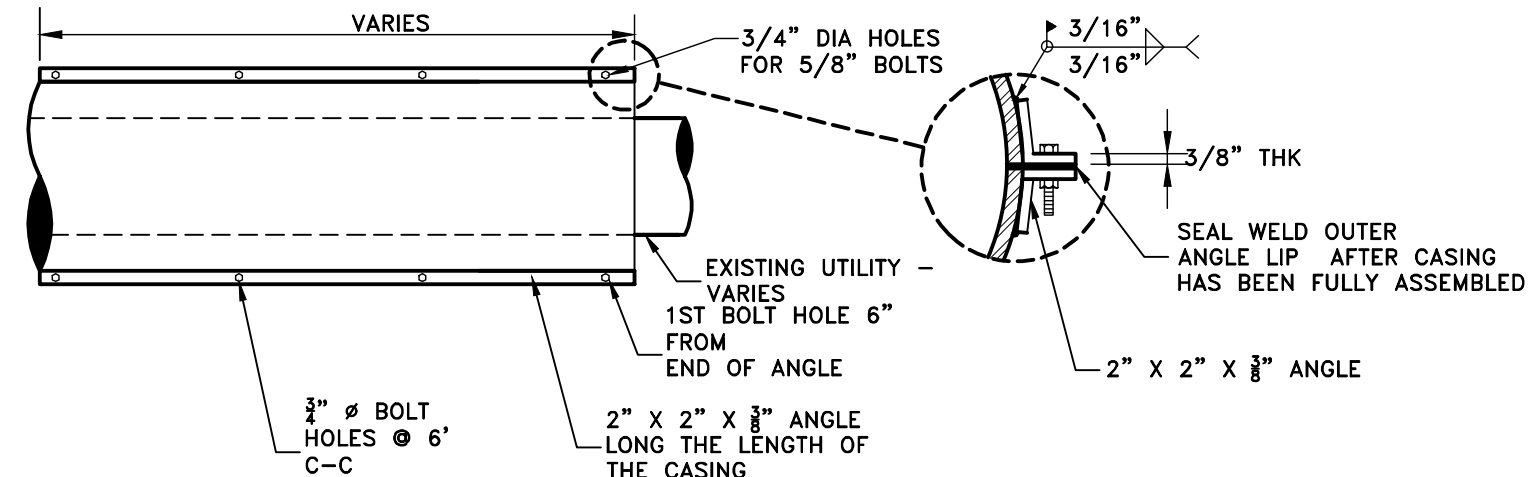
- 1.) ALTERNATIVELY, DIG DOWN THREE FEET INTO EXISTING SOIL AND POUR 3500 PSI CONCRETE UP TO 1' OF THE PROPOSED BOTTOM OF THE MANHOLE. USE #57 CRUSHED STONE TO ESTABLISH GRADE FOR STRUCTURE.



MANHOLE INSTALLED IN DISTURBED SOIL



SINK HOLE REPAIR



NOTES:

1. SPLIT CASINGS ARE INTENDED FOR OPEN CUT INSTALLATIONS ONLY AND PRIMARILY FOR PROTECTING EXISTING UTILITIES.
2. SPLIT CASING WILL NOT BE ACCEPTABLE FOR BORE AND JACK INSTALLATIONS.
3. CASING SPACERS SHALL BE PROVIDED AS SPECIFIED FOR TYPICAL CASING INSTALLATIONS.
4. SIZING AND SPACER CONFIGURATION PER TYPICAL CASING DETAIL.

TYPICAL SPLIT CASING DETAIL