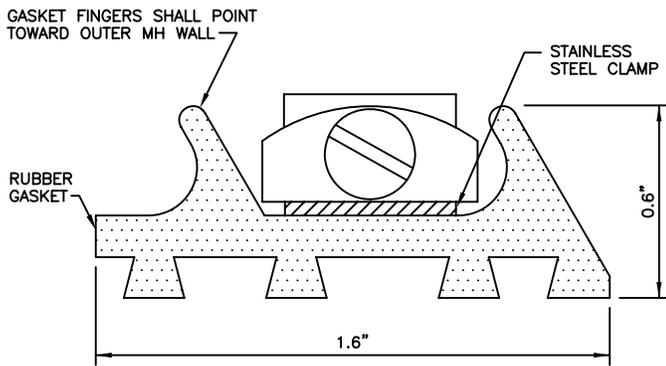
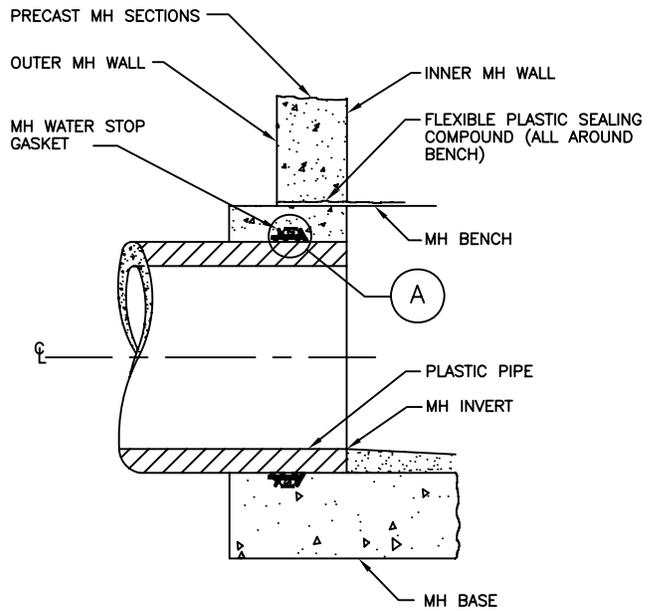


INDEX OF DRAWINGS
SANITARY SEWER

<u>DRAWING NO.</u>	<u>TITLE</u>
SS1	MH/PIPE WATER STOP GASKET
SS2	FLOW METERING AND SAMPLING STATION
SS3A	STANDARD MANHOLE (1 OF 2)
SS3B	STANDARD MANHOLE (2 OF 2)
SS4	MANHOLE WITH PRIVATE UNDERDRAIN
SS5	SHALLOW MANHOLE
SS6	24" MANHOLE RING AND COVER
SS7	RESERVED FOR FUTURE DETAIL
SS8	SANITARY SEWER TRENCH DETAIL
SS9	TRENCH DETAIL WITH PRIVATE UNDERDRAIN
SS10	SERVICE MAINTENANCE LINE
SS11A	TYPICAL MH BASE CHANNELIZATION (1 OF 2)
SS11B	TYPICAL MH BASE CHANNELIZATION (2 OF 2)
SS12	MANHOLE STEPS
SS13	FIBERGLASS MARKER POST
SS14	STEEL MARKER POST
SS15	DOMESTIC SEWER TAPPING
SS16	INTERMEDIATE PLATFORM
SS17A	MANHOLE OUTSIDE DROPS (1 OF 3) (DROP THROUGH MANHOLES < 18")
SS17B	MANHOLE OUTSIDE DROPS (2 OF 3) (DROP THROUGH MANHOLES < 18")
SS17C	MANHOLE OUTSIDE DROPS (3 OF 3) (DROP THROUGH MANHOLES < 18")
SS18	SEWER SERVICE CONNECTION
SS19	PIPE CROSSING SUPPORT PAD
SS20	CLAY OR CONCRETE CUT-OFF WALL
SS21	DITCH OR PIPE CROSSING
SS22	TYPICAL GREASE INTERCEPTOR



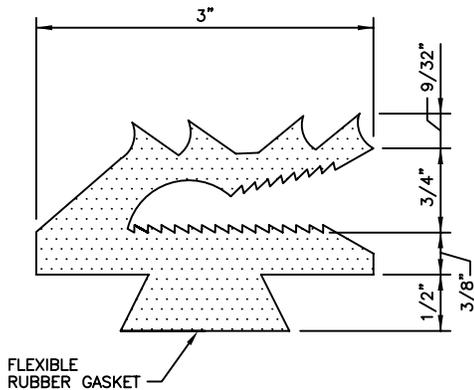
A DETAIL - MH WATER STOP GASKET



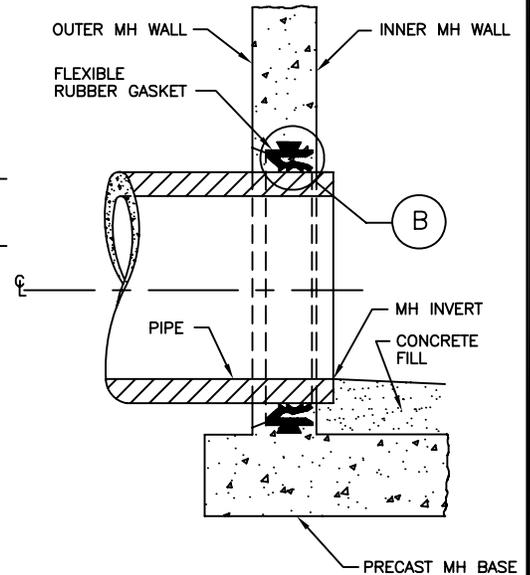
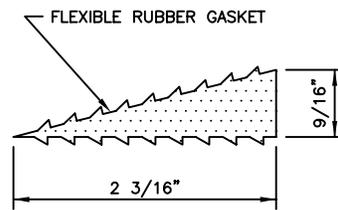
NOTES:

1. PLACE STOP ON PIPE NEAR CENTER OF MANHOLE WALL.
2. TIGHTEN STEEL BAND TO ASSURE POSITIVE SEAL AGAINST PIPE OUTSIDE. A SCREWDRIVER MAY BE USED TO TAKE UP INITIAL SLACK BUT A SOCKET WRENCH (5/16") IS PREFERRED TO ENSURE PROPER TIGHTNESS.

CAST-IN-PLACE MANHOLE CONNECTION DETAILS FOR PLASTIC PIPE



B DETAIL - FLEXIBLE RUBBER WEDGE TYPE GASKET

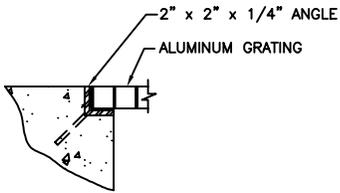


NOTE:

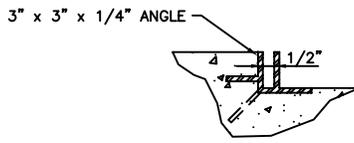
1. ALL MATERIAL SPECIFICATIONS AND INSTALLATION REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.

PRECAST MANHOLE CONNECTION DETAILS FOR ANY TYPE OF PIPE

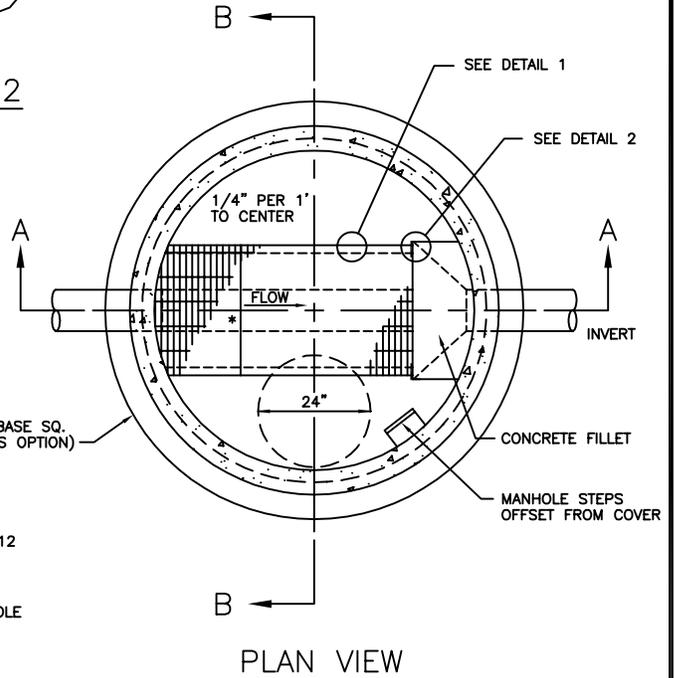




DETAIL 1

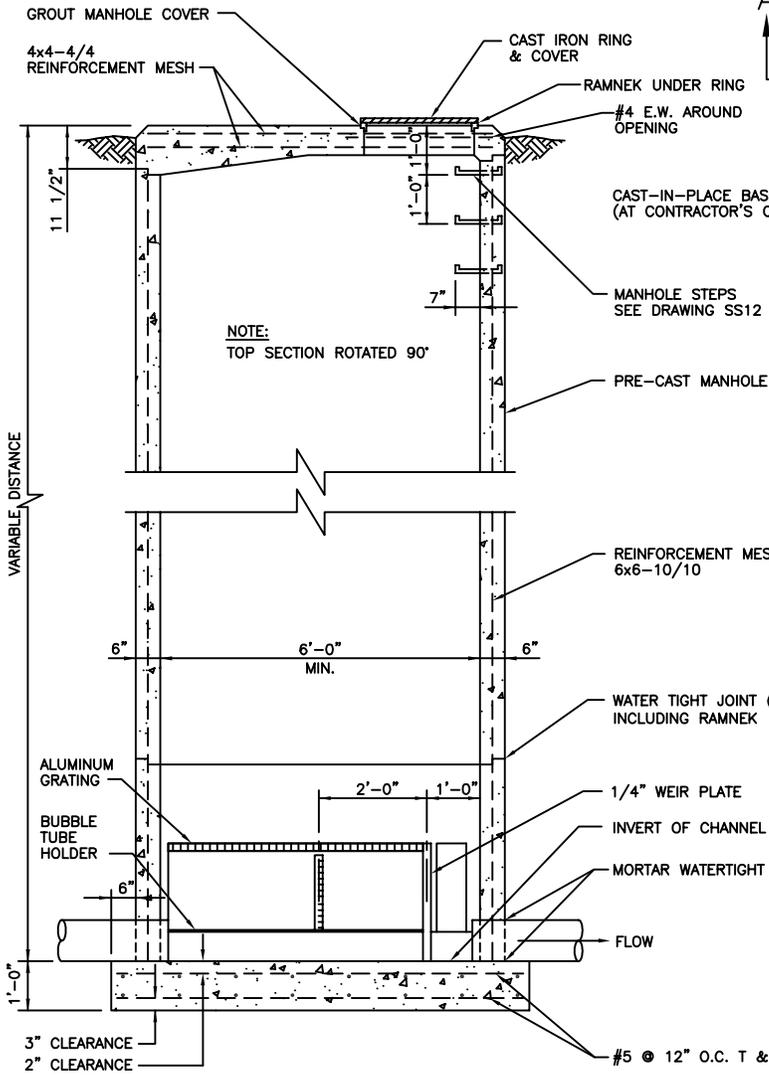


DETAIL 2

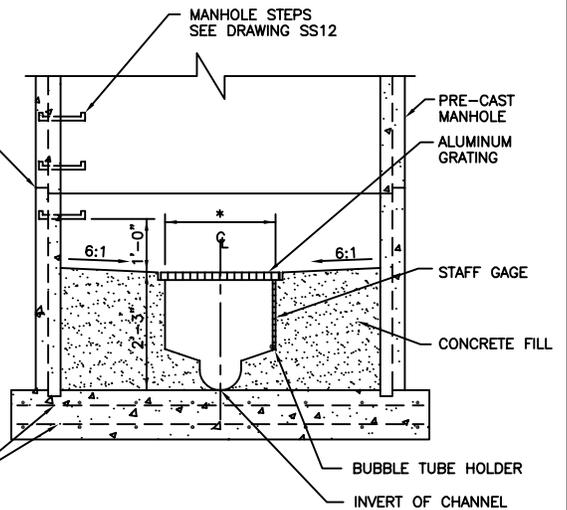


PLAN VIEW

* VARIES WITH FLOW

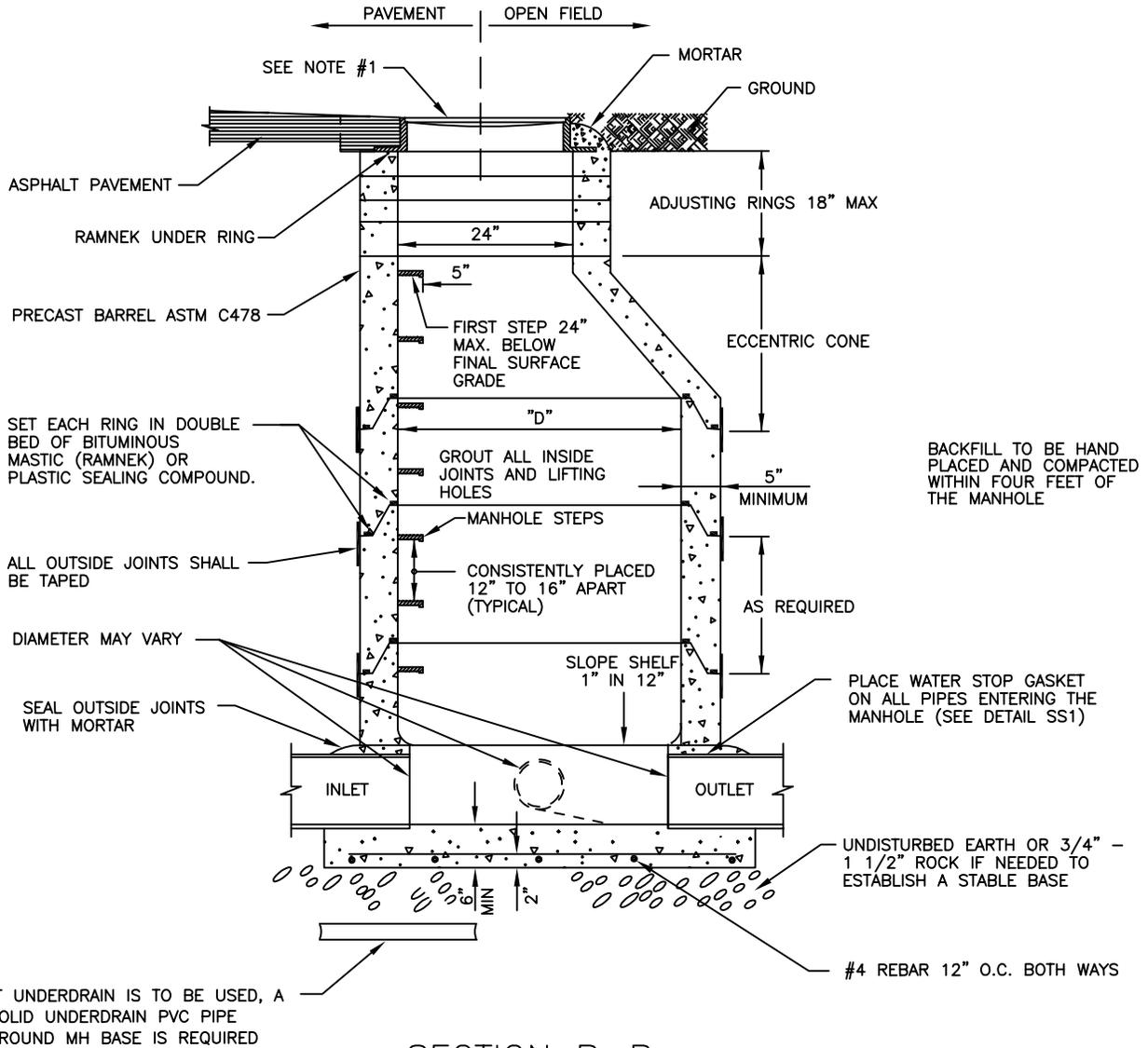


SECTION A



SECTION B

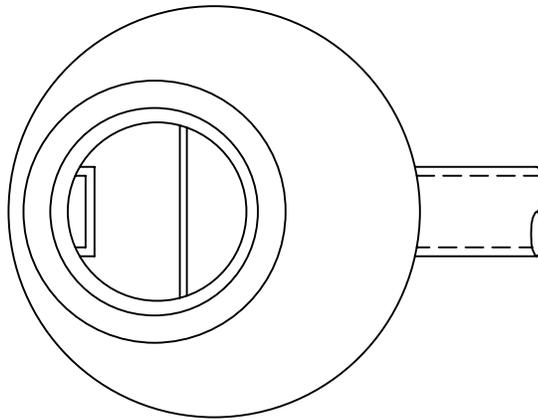




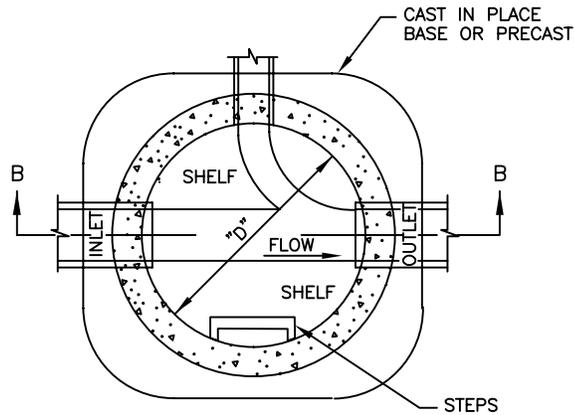
NOTES:

1. FINAL GRADE OF MANHOLE COVERS SHALL BE 1/4" LOWER THAN FINAL STREET.
2. ALL CHANNELS FLOWING INTO THE MAIN STREAM OF THE SEWER SHALL BE HAND FORMED INTO THE FLOW.
3. STEPS SHOULD BE PLACED OVER THE SHELF, NOT OVER THE FLOW. NO STEPS ALLOWED IN THE ADJUSTING RING AREA.
4. PRECAST CONCRETE SECTIONS SHALL CONFORM TO ASTM C-478.
5. BLOCK-OUTS, WHEN APPROVED, SHALL EXTEND A MAX. OF 6" PAST MANHOLE O.D. AND BE SATISFACTORILY PLUGGED AND SEALED.
6. BENCH MUST HAVE A BRUSHED, NON-SKID SURFACE.
7. BENCH IS TO BE EVEN WITH TOP OF PIPES
8. A MINIMUM OF 0.2' AND MAXIMUM OF 2' FALL REQUIRED FROM INLET TO OUTLET
9. MANHOLES NOT IN ASPHALT OR CONCRETE SHALL BE RAISED 6" ABOVE FINAL GRADE AND A CONCRETE COLLAR INSTALLED WITH A GREEN CARSONITE POST





ECCENTRIC CONE PLAN VIEW

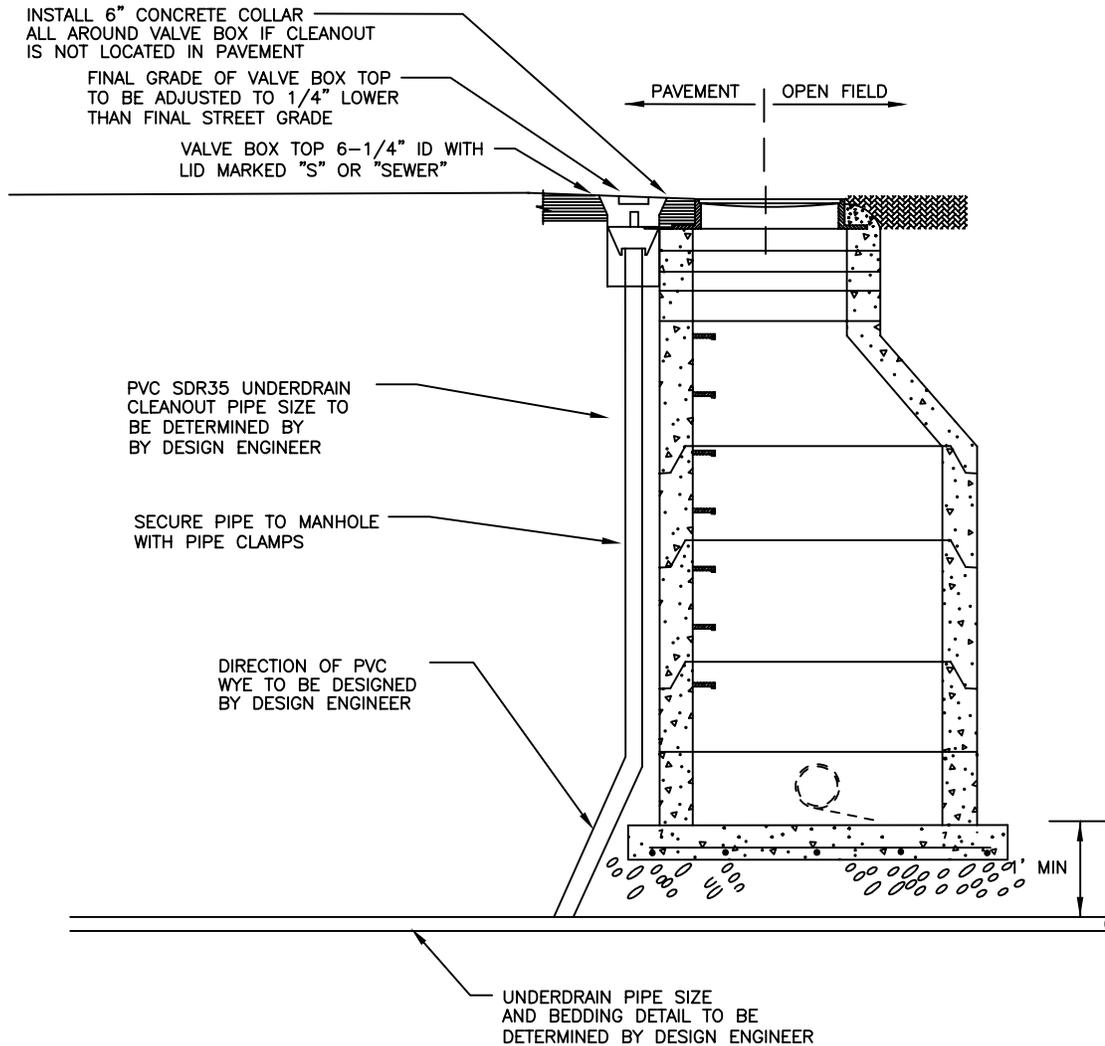


BASE PLAN VIEW

PIPE I.D.	MANHOLE I.D.	RING & COVER
18" & SMALLER	4'-0"▲	24"
21" TO 48"	5'-0"	30"
54"	6'-0"	30", 36" W/ 24"
60" & LARGER	SPECIAL DESIGN	INNER COVER

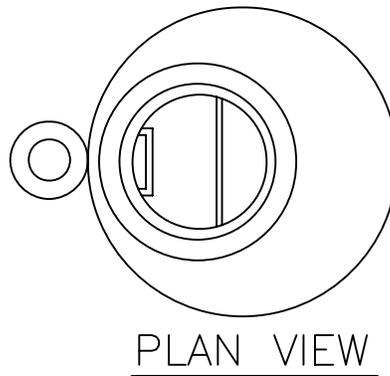
▲ WHENEVER MORE THAN A TWO WAY MANHOLE OF MAX. PIPE I.D. IS REQUIRED, THE MANHOLE SHOULD BE INCREASED TO LARGER DIA., EG. 18"x18"x18", REQUIRES 5'-0" I.D.

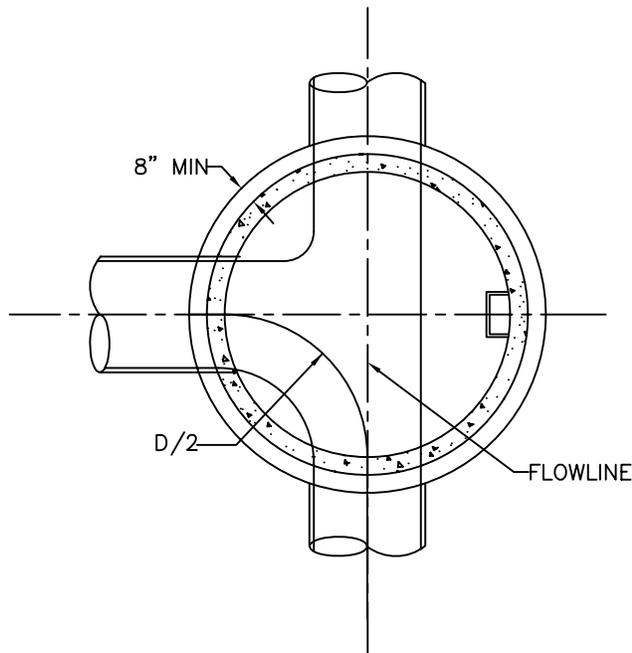
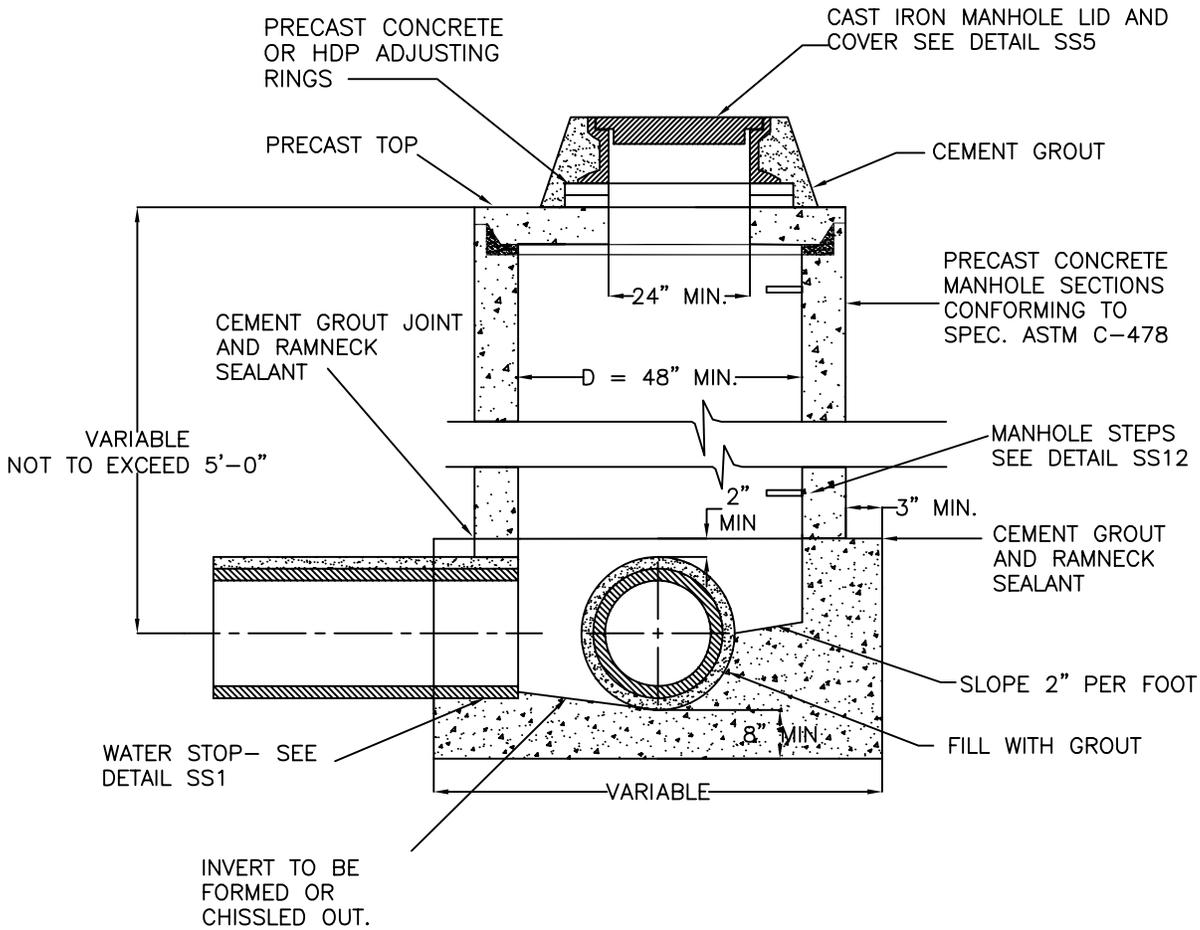


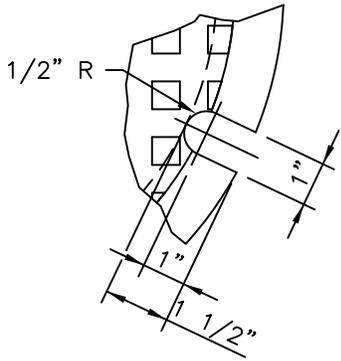
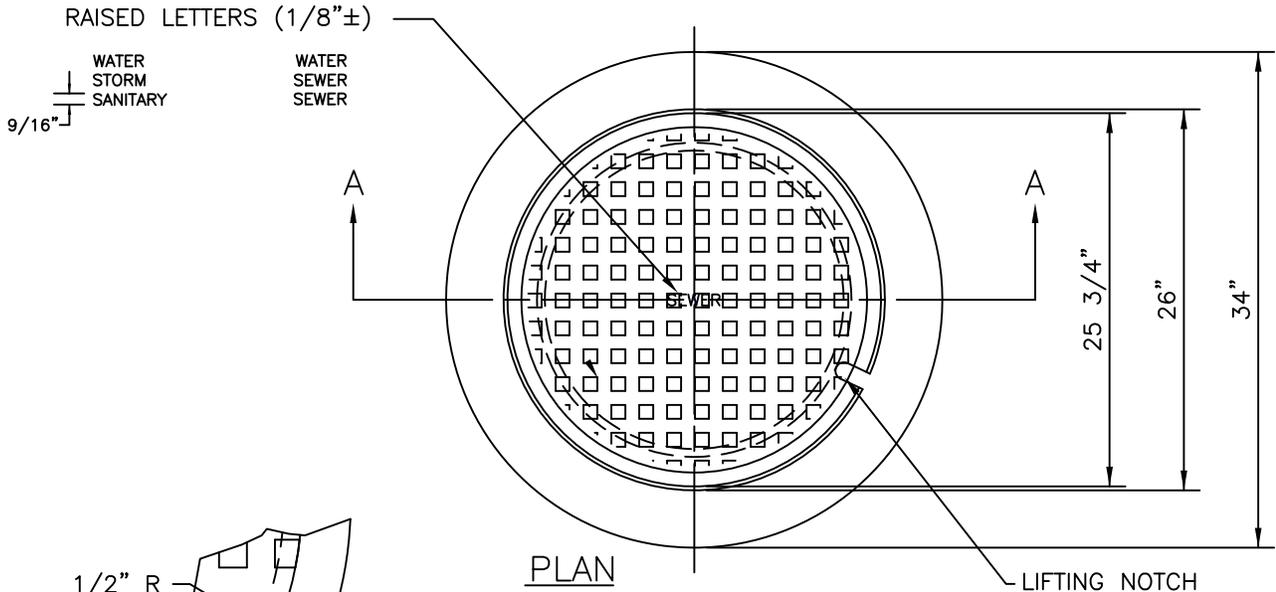


NOTES:

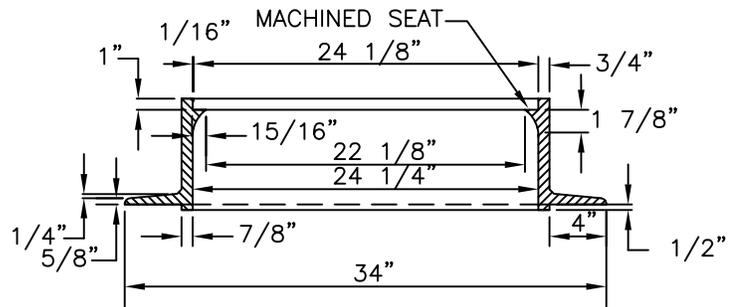
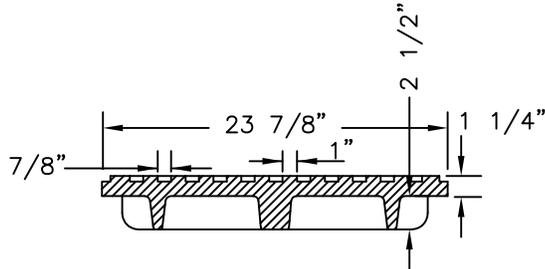
1. ALL UNDERDRAIN SYSTEMS SHALL BE PRIVATE AND NOT MAINTAINED BY THE TOWN OF ERIE
2. PLACE UNDERDRAIN COLLECTOR PIPE AROUND CONCRETE MANHOLE BASE
3. CLEANOUT TO BE PLACED UPSTREAM/DOWNSTREAM OF SANITARY MANHOLE AS DETERMINED BY DESIGN ENGINEER
4. SEE "TRENCH DETAIL WITH PRIVATE UNDERDRAIN" DETAIL FOR VERTICAL LOCATION OF UNDERDRAIN







LIFTING NOTCH



SECTION A-A

1. CASTING SPECIFICATIONS: ASTM A-48 WITH A MINIMUM TENSILE STRENGTH OF 25 KSI (CLASS 25)
2. ALL CASTINGS TO BE DIPPED IN ASPHALT BASE PAINT (OR APPROVED EQUAL)
3. CASTINGS SHALL BE AS SPECIFIED BELOW OR APPROVED EQUAL:

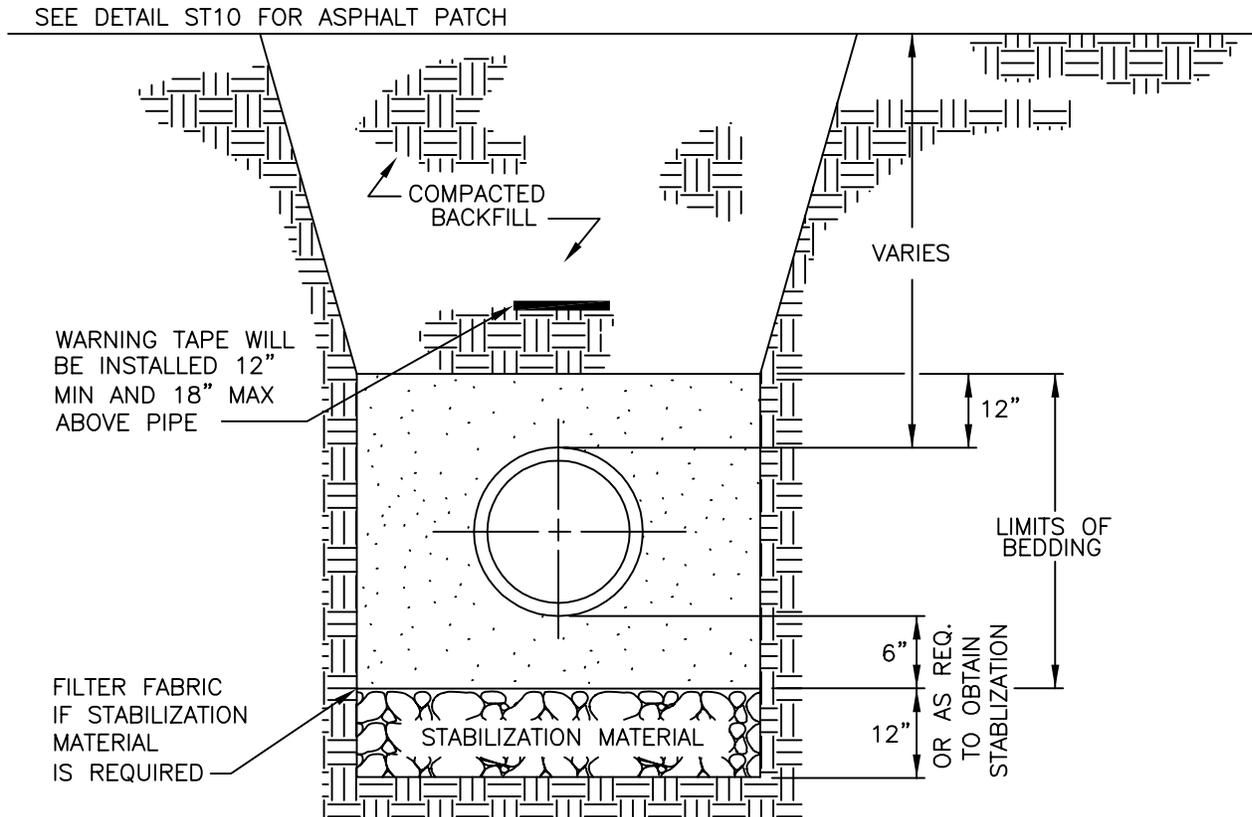
MANUFACTURERS	CAT. #
NEENAH	R-1706
CASTINGS, INC.	MH-400-24 C.I.
HUTCHINSON FDRY. & STL. INC.	MH-400

4. ALL NEW MANHOLES MUST INCLUDE A PLASTIC OR VINYL TAG ATTACHED TO THE TOP STEP STATING THE FOLLOWING "CAUTION CONFINED SPACE; ENTRY PERMIT REQUIRED.



RESERVED FOR FUTURE DETAIL

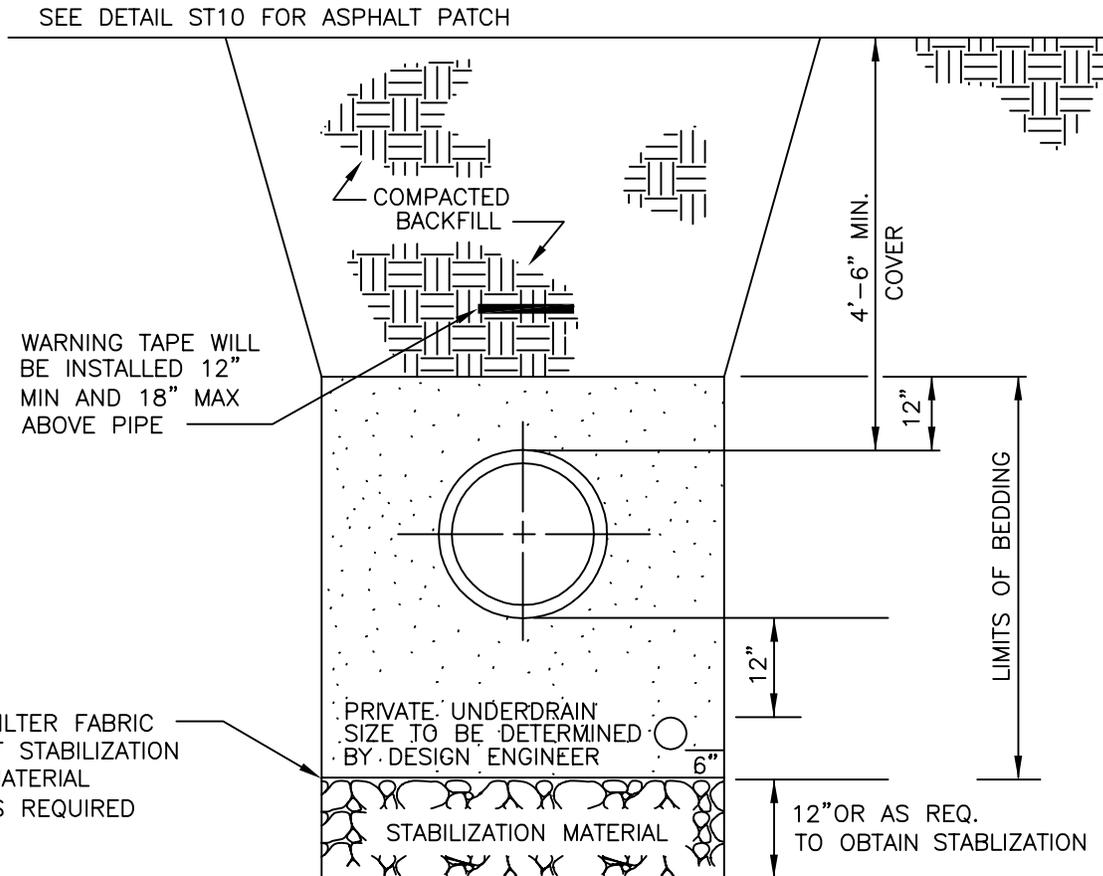




NOTES:

1. COMPACTION SHALL BE AS FOLLOWS: PIPE ZONE BEDDING 6" UNDER AND 12" OVER PIPE WILL REQUIRE 90% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
2. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
3. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
4. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.
5. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
6. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED, A CONCRETE CRADLE SHALL BE PLACED WITH 2500 P.S.I. CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE.



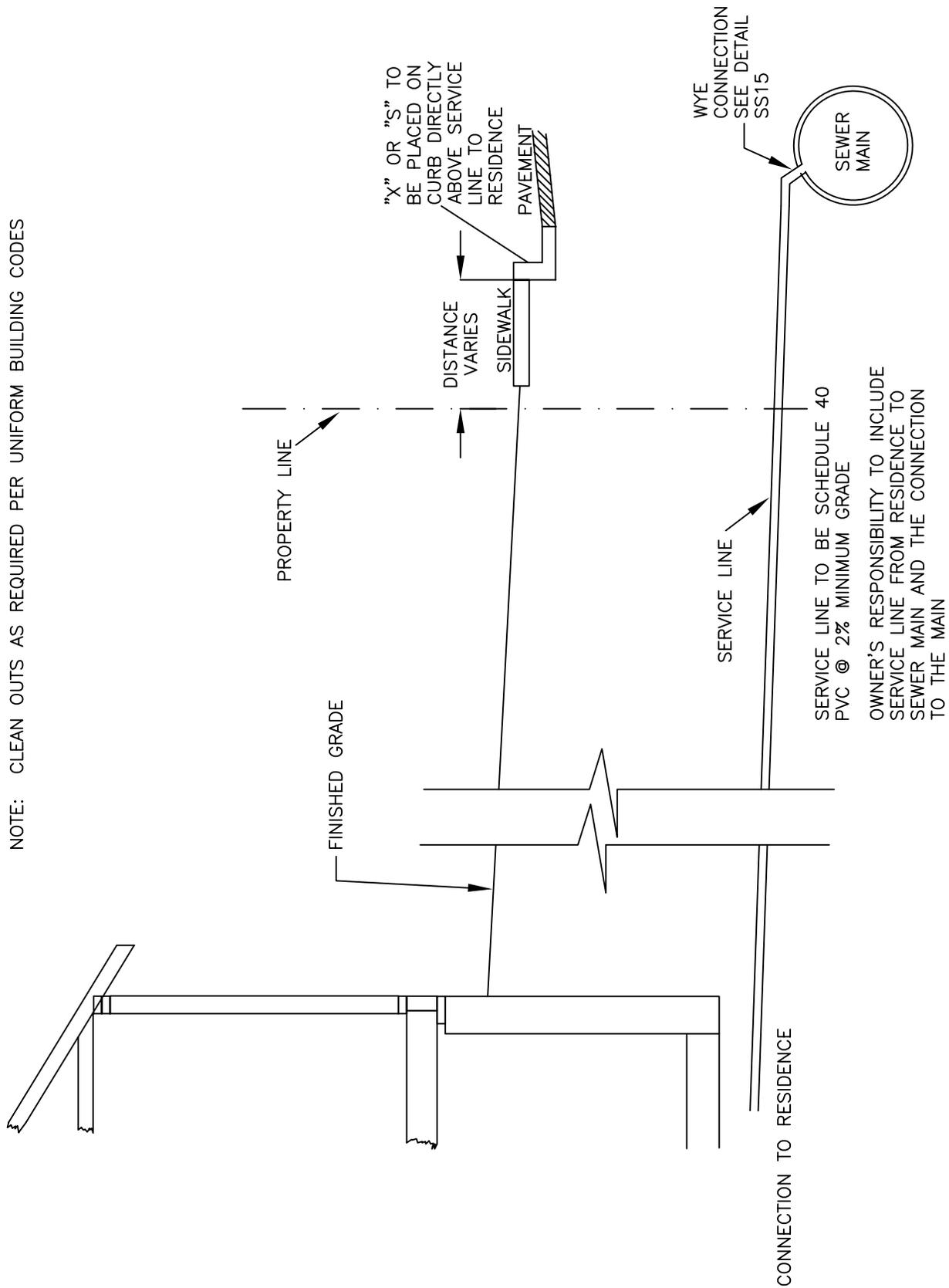


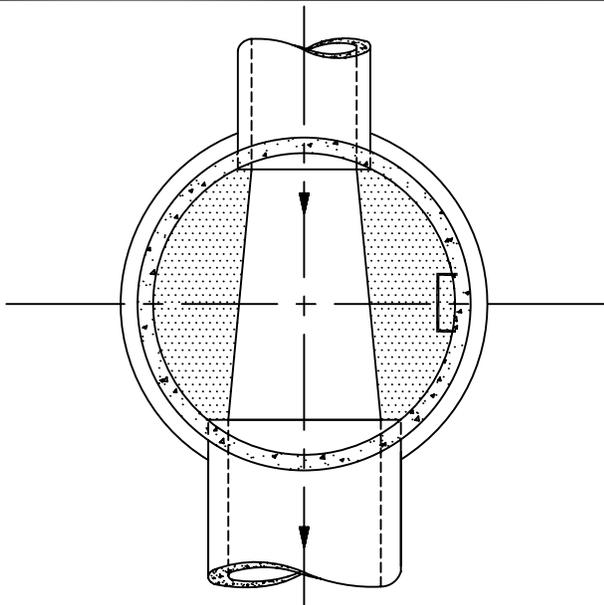
NOTES:

1. BACKFILL TO BE COMPACTED TO 95% ASTM D-698, OR 70% OF ASTM D-4253 AND 4254 RELATIVE DENSITY, IN ALL AREAS UNLESS OTHERWISE NOTED.
2. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
3. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
4. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.
5. TRENCH WIDTH SHALL NOT BE MORE THAN 16" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
6. COMPACTION SHALL BE AS FOLLOWS: PIPE ZONE BEDDING 6" UNDER AND 12" OVER PIPE WILL REQUIRE 90% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
7. ALL UNDERDRAIN SYSTEMS SHALL BE PRIVATE AND WILL NOT BE MAINTAINED BY THE TOWN OF ERIE.

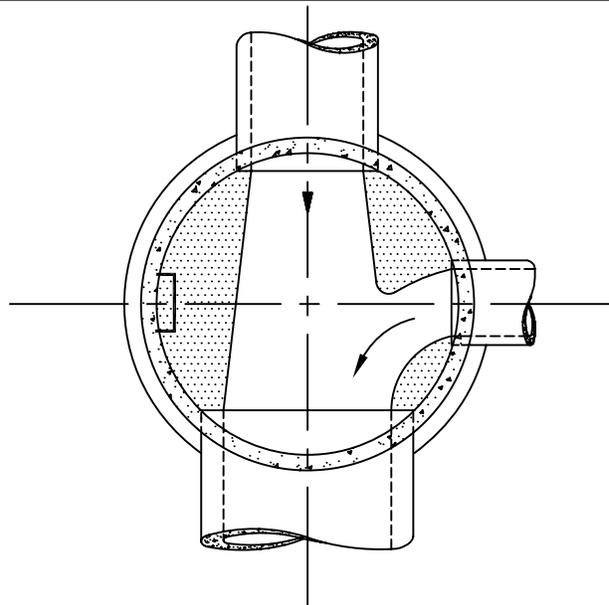


NOTE: CLEAN OUTS AS REQUIRED PER UNIFORM BUILDING CODES

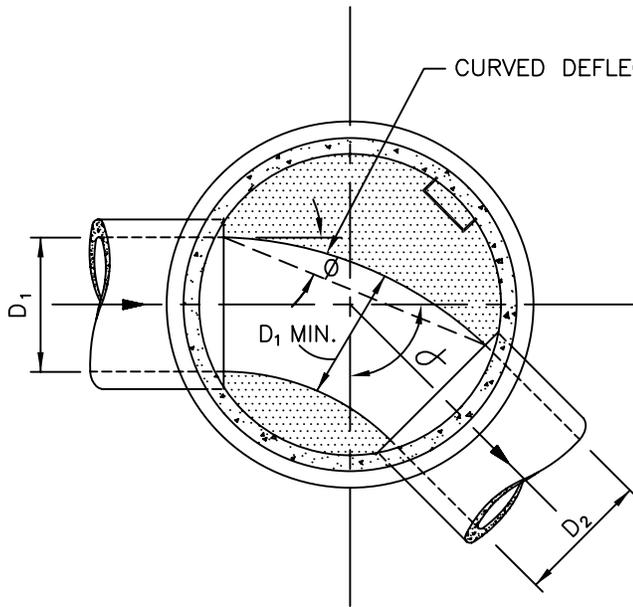




THROUGH PIPE



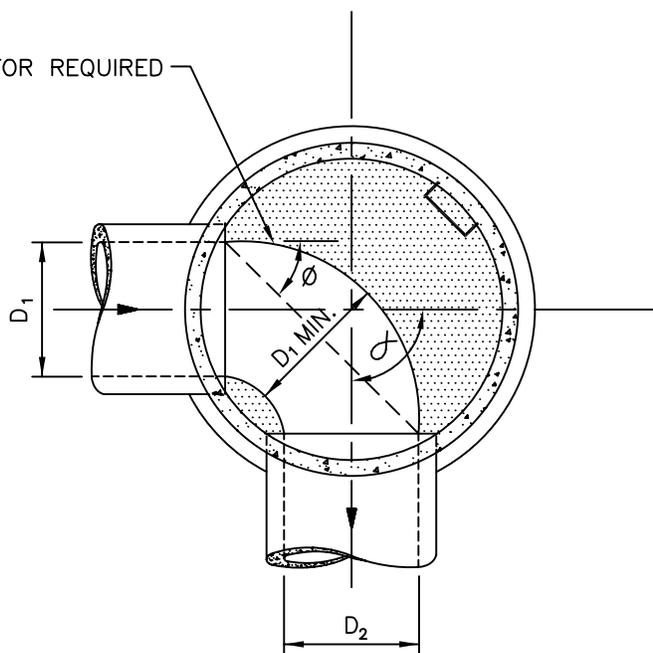
THROUGH PIPE
ONE LATERAL



INTERMEDIATE ANGLE

$$\phi = \frac{\alpha}{2}$$

$$30^\circ < \alpha < 90^\circ$$



SHARP ANGLE

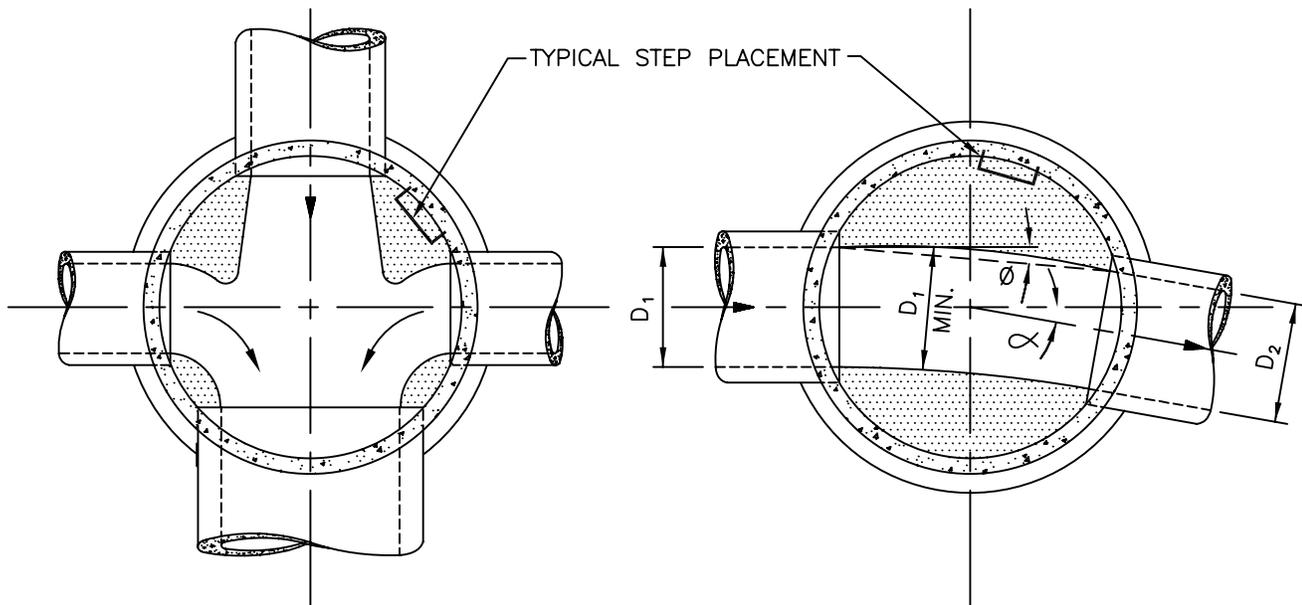
$$\phi = 45^\circ$$

$$\alpha = 90^\circ$$

NOTES:

1. DETAILS SHOWN ARE TYPICAL ONLY FOR INSTALLATIONS WITH ALL INVERTS AT SAME RELATIVE ELEVATION.
2. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, ETC. SPECIAL BASE/CHANNEL DETAILS SHALL BE SHOWN ON PLANS.
3. CHANNELIZATION DETAILS & STEP PLACEMENT TYPICAL FOR BOTH STORM AND SANITARY SEWER MH'S.
4. THE MINIMUM VERTICAL DROP THRU MANHOLE BASE SHALL BE 0.20 FOOT.
5. FOR VERTICAL DROPS IN EXCESS OF 1.5 FEET AN OUTSIDE DROP MANHOLE IS REQUIRED.



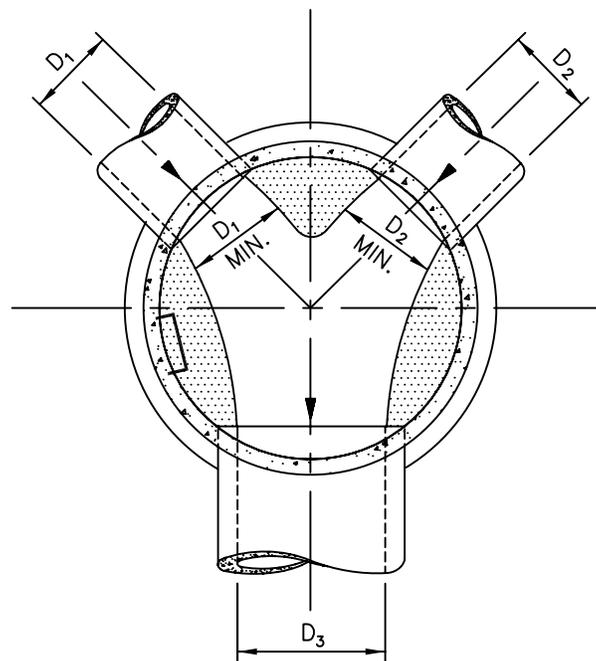


THROUGH PIPE
TWO LATERALS

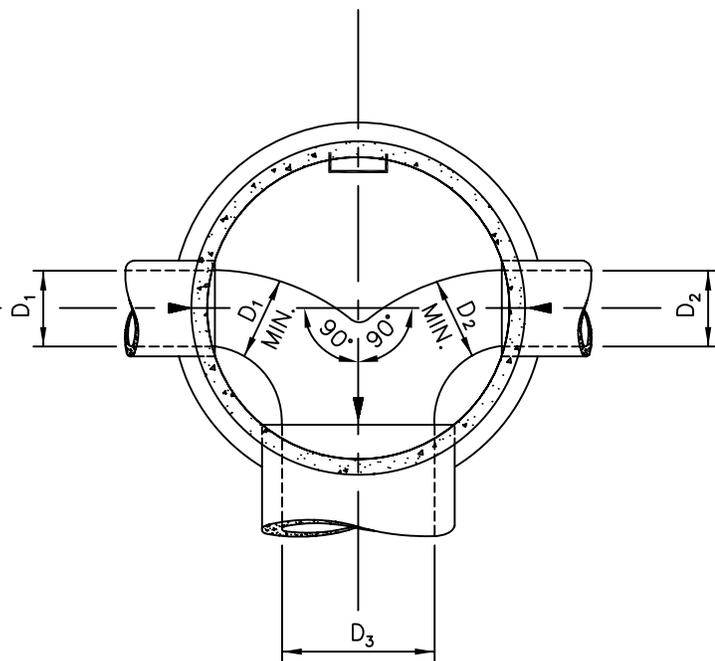
SLIGHT ANGLE

$$\theta \leq 15^\circ$$

$$\alpha \leq 30^\circ$$



ANGLED LATERALS

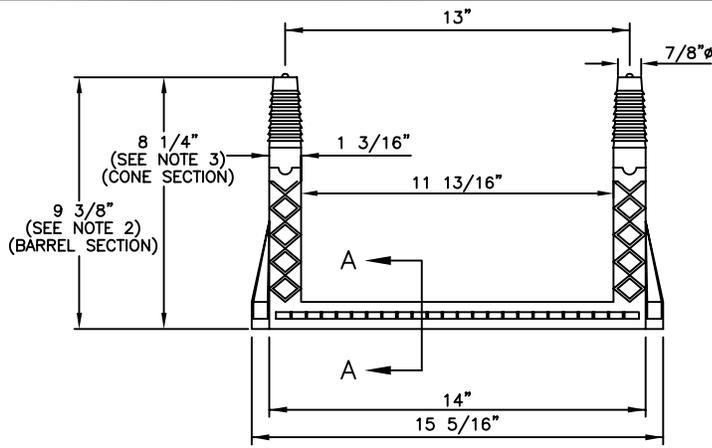


OPPOSED LATERALS

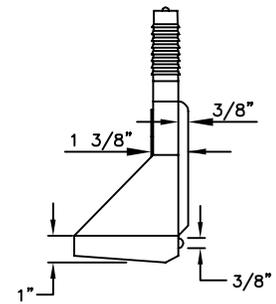
NOTES:

1. DETAILS SHOWN ARE TYPICAL ONLY FOR INSTALLATIONS WITH ALL INVERTS AT SAME RELATIVE ELEVATION.
2. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, ETC. SPECIAL BASE/CHANNEL DETAILS SHALL BE SHOWN ON PLANS.
3. CHANNELIZATION DETAILS & STEP PLACEMENT TYPICAL FOR BOTH STORM AND SANITARY SEWER MH'S.
4. THE MINIMUM VERTICAL DROP THRU MANHOLE BASE SHALL BE 0.20 FOOT.
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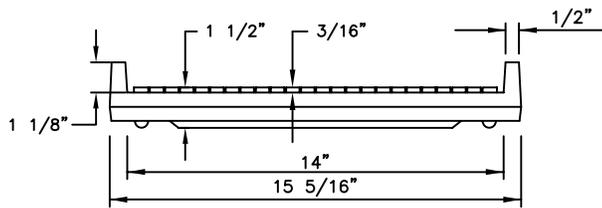




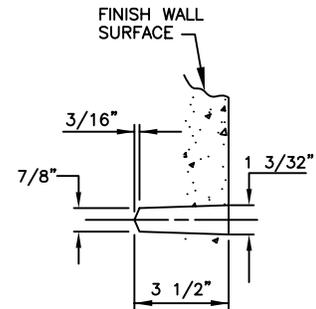
PLAN



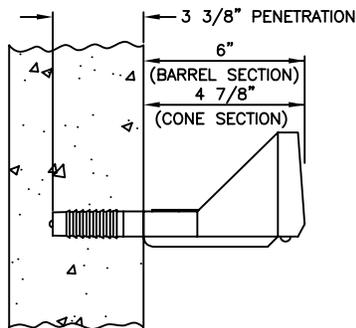
END VIEW



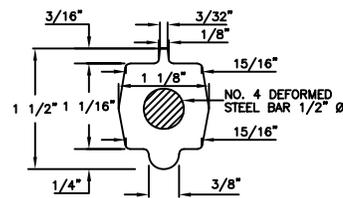
ELEVATION



DETAIL
PIN BLOCK OUT



DETAIL



SECTION A-A

POLYPROPYLENE REINFORCED PLASTIC STEP

NOTES:

1. ASTM SPECIFICATIONS:
 - A. ASTM C-478
 - B. ASTM A-615 GRADE 60 (STEEL REBAR).
 - C. ASTM 2146-69, TYPE III, GRADE 16906 (POLYPROPYLENE).
2. STEPS INSTALLED IN MANHOLE BARREL SECTIONS OR VERTICAL WALLS OF STRUCTURES SHALL HAVE A 9 3/8 INCH LEG AND SHALL PROJECT FROM THE WALL 6 INCHES.
3. STEPS INSTALLED IN MANHOLE CONE SECTIONS SHALL HAVE AN 8 1/4 INCH LEG AND SHALL PROJECT FROM THE WALL 4 7/8 INCHES.
4. ALL STEPS SHALL HAVE A PENETRATION DEPTH INTO THE WALL OF 3 3/8 INCHES.
5. STEPS SHALL BE INSTALLED BY THE "PRESS-FIT" METHOD UTILIZING A SPECIALLY TAPERED PIN TO FORM THE INSERT HOLE AS SHOWN, FOLLOWING MANUFACTURER'S RECOMMENDED PROCEDURE AND SHALL NOT BE GROUTED IN PLACE.
6. INSTALLED STEPS SHALL BE CAPABLE OF WITHSTANDING A PULL OUT FORCE OF 2500 LB. PER LEG FOR A MINIMUM PERIOD OF TWO MINUTES.
7. PINS MUST BE SMOOTH AND CONTINUOUSLY TAPERED. DIMENSIONS OF THE PIN AND THE INSERTED PORTION OF THE MANHOLE STEP ARE TYPICAL ONLY. W.M.D. INSTALLATIONS REQUIRE A MATCHED COMBINATION OF A TAPERED INSERT PIN AND MANHOLE STEP, AS RECOMMENDED OR REQUIRED BY SPECIFIC MANUFACTURER OF THE STEP TO BE USED.
8. THIS STEP CAN ALSO BE USED IN TOE POCKET INSTALLATIONS PROVIDED 5" TOE CLEARANCE IS ALLOWED.

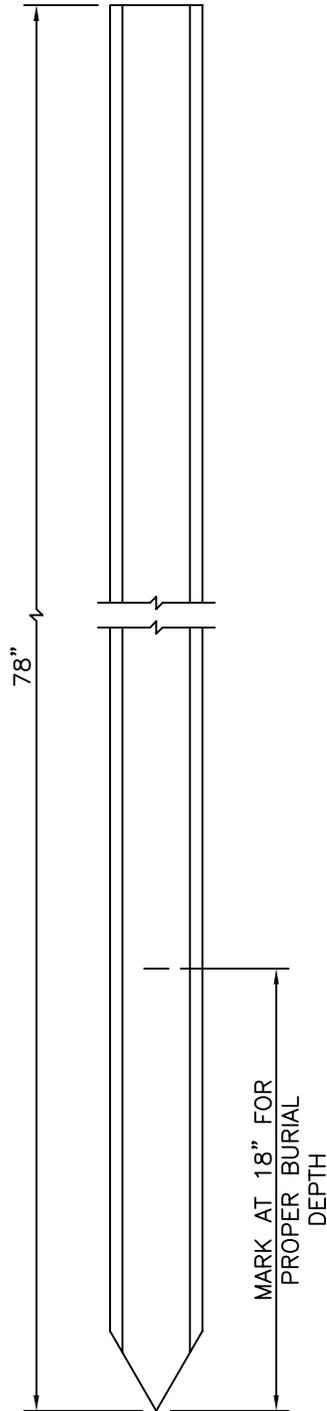
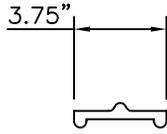
The Town of
ERIE
COLORADO



DRAWING TITLE: **MANHOLE STEPS**

DRAWING NUMBER: **SS12**

DRAWN BY: **D. JENKINS** APPROVED BY: **G. BEHLEN** DATE: **06/2004**



NOTES:

1. UTILITY MARKER POST SHALL BE CARSONITE CUM-375 OR EQUAL WITH ANCHORS AND APPROPRIATE DECALS FOR SANITARY SEWER AND WATER.
2. COLOR FOR SANITARY SEWER-GREEN.



4" DIA. STEEL POST PAINTED GREEN, FILLED WITH CONCRETE

MH OBJECT (MANHOLE)

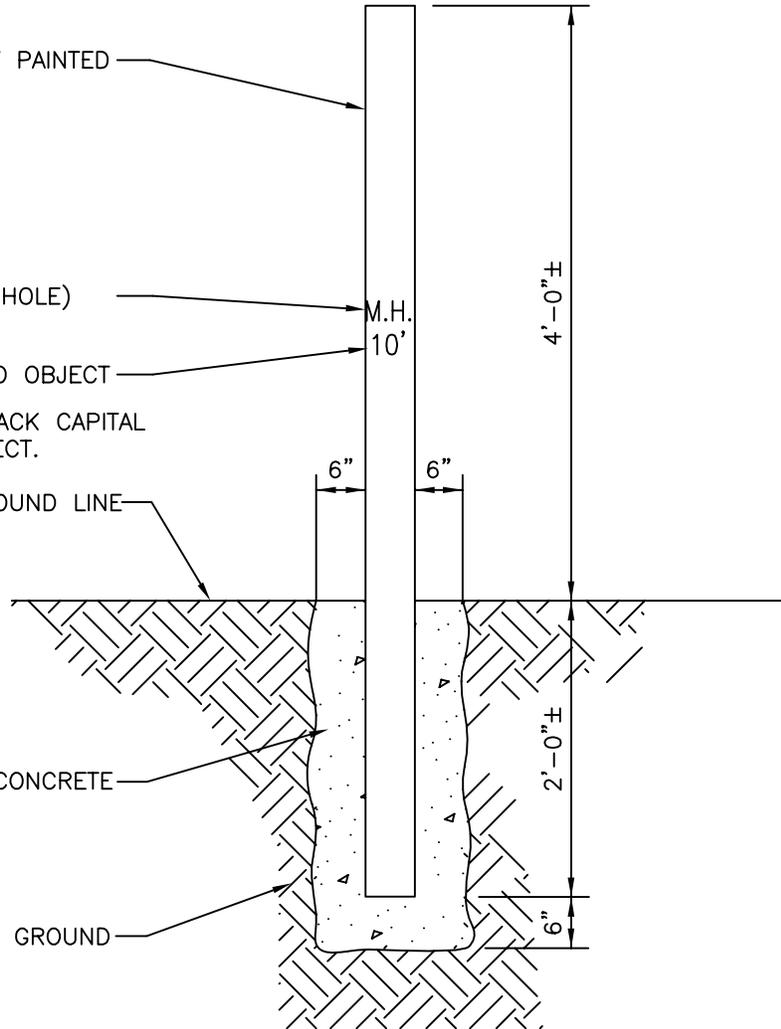
10' DISTANCE TO OBJECT

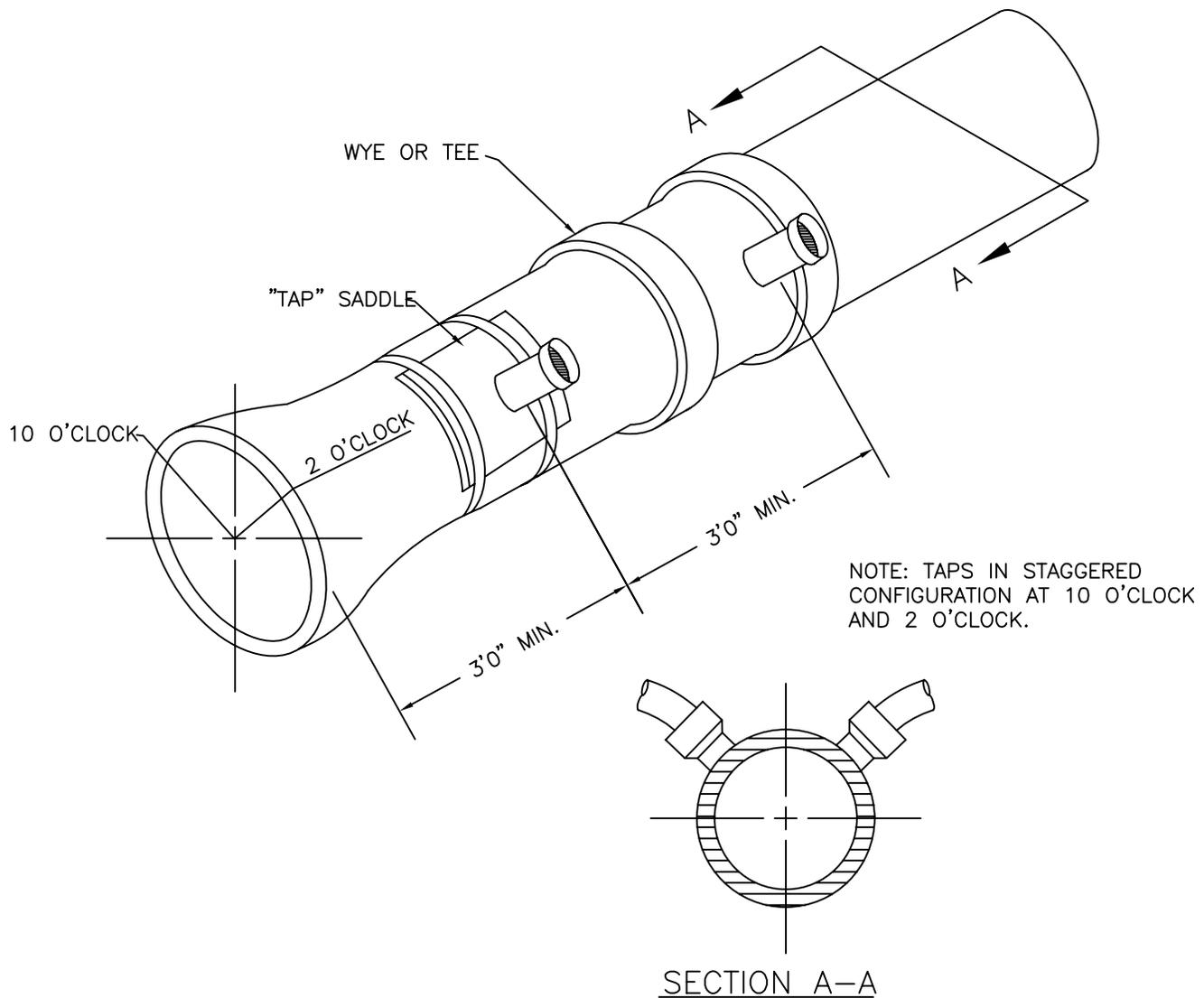
2" HIGH STENCILED BLACK CAPITAL LETTERS TO FACE OBJECT.

GROUND LINE

CONCRETE

UNDISTURBED GROUND

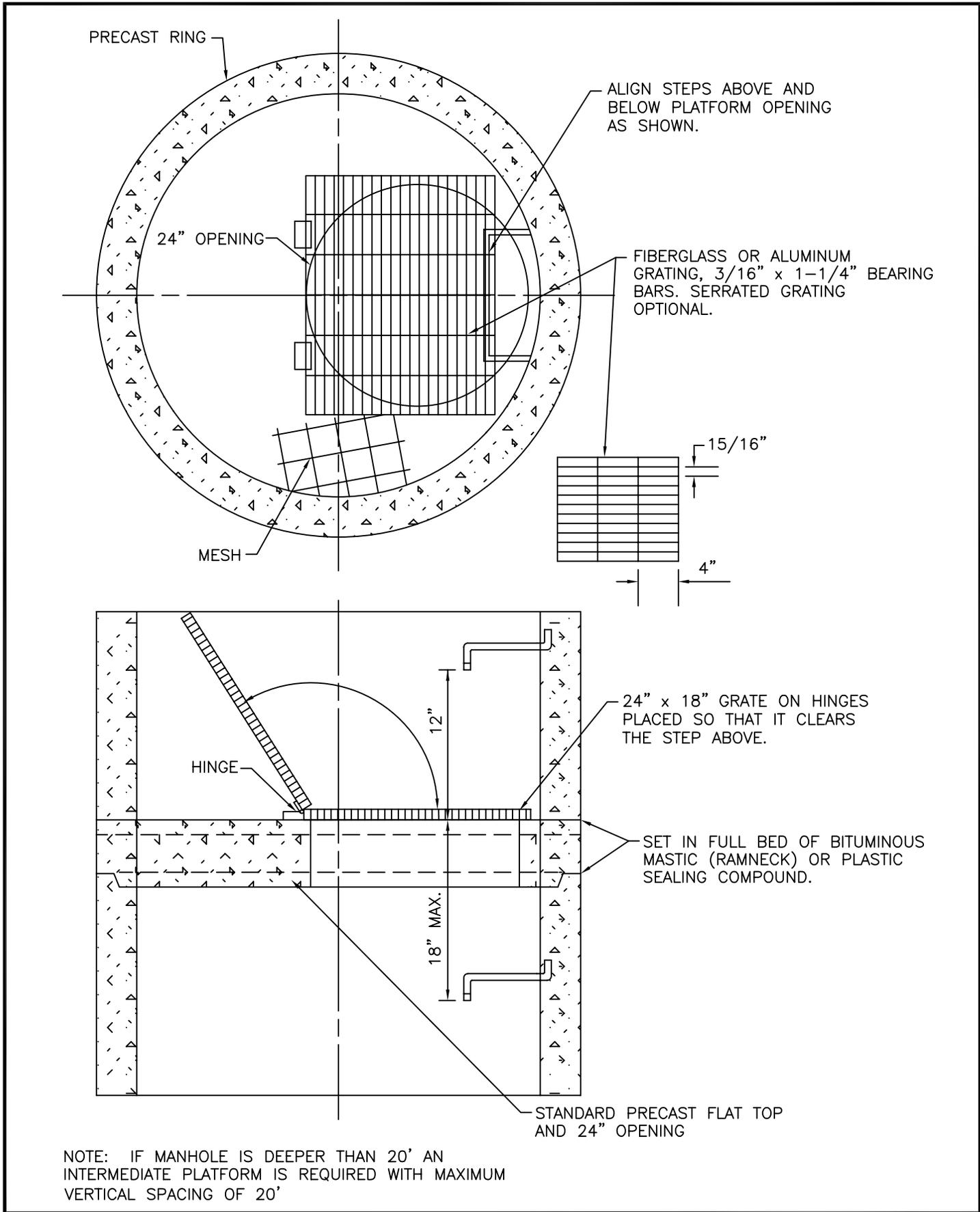


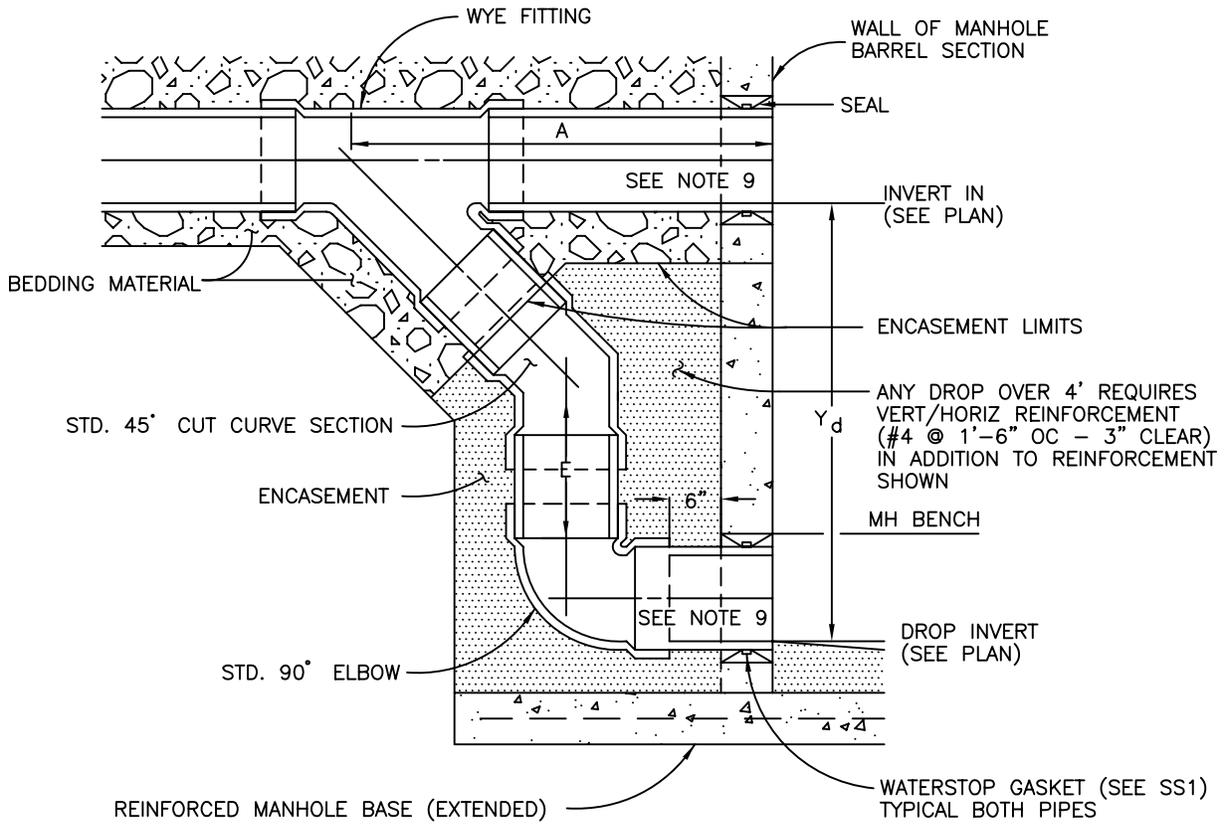


NOTES:

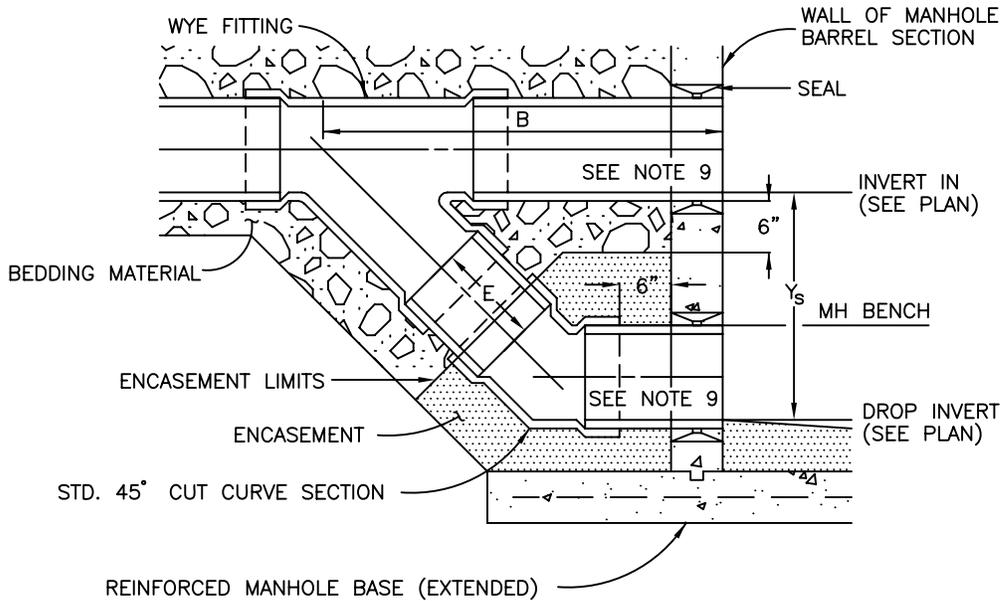
1. SEWER SERVICE CONNECTIONS SHALL BE POSITIONED AT EITHER THE 2 O'CLOCK OR THE 10 O'CLOCK POSITION ON THE CIRCUMFERENCE OF THE SEWER MAIN.
2. ON NEW INSTALLATIONS, EITHER WYE OR TEE FITTINGS SHALL BE USED. WHEN TAPPING INTO AN EXISTING SEWER MAIN, A SADDLE CONNECTION AND APPROVED CORING METHOD SHALL BE USED.
3. THE MINIMUM DISTANCE BETWEEN SERVICE CONNECTIONS MADE ALONG THE PIPE SHALL BE 3-FEET. THE MINIMUM DISTANCE FROM EITHER THE BELL OR SPIGOT END OF A PIPE SHALL BE 3-FEET. THE MINIMUM DISTANCE FROM THE CENTER OF A MANHOLE TO A SERVICE CONNECTION SHALL BE EITHER 5-FEET OR THE TRANSITION POINT FROM THE MANHOLE TRENCH, WHICHEVER IS GREATER.
4. A MAXIMUM OF 4 SEWER SERVICE CONNECTIONS SHALL BE ALLOWED PER 20-FOOT LENGTH OF PIPE. A SPECIFIC SOILS INVESTIGATIONS SHOULD BE CONDUCTED TO ASSURE THAT THE EXTERNAL LOADING WILL BE WITHIN ALLOWABLE LIMITS REGARDLESS OF THE NUMBER OF TAPS INVOLVED.







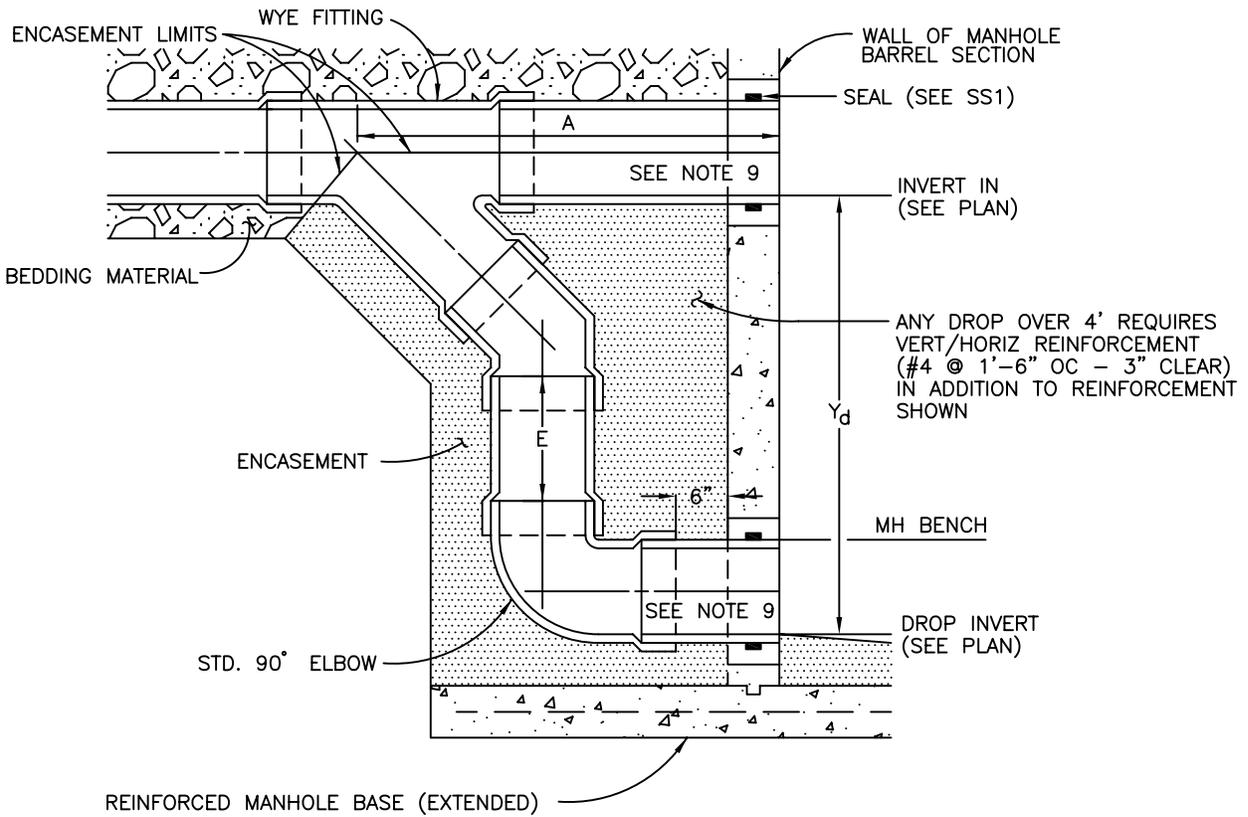
OUTSIDE DROP-DEEP: FOR PVC



OUTSIDE DROP-SHALLOW: FOR PVC

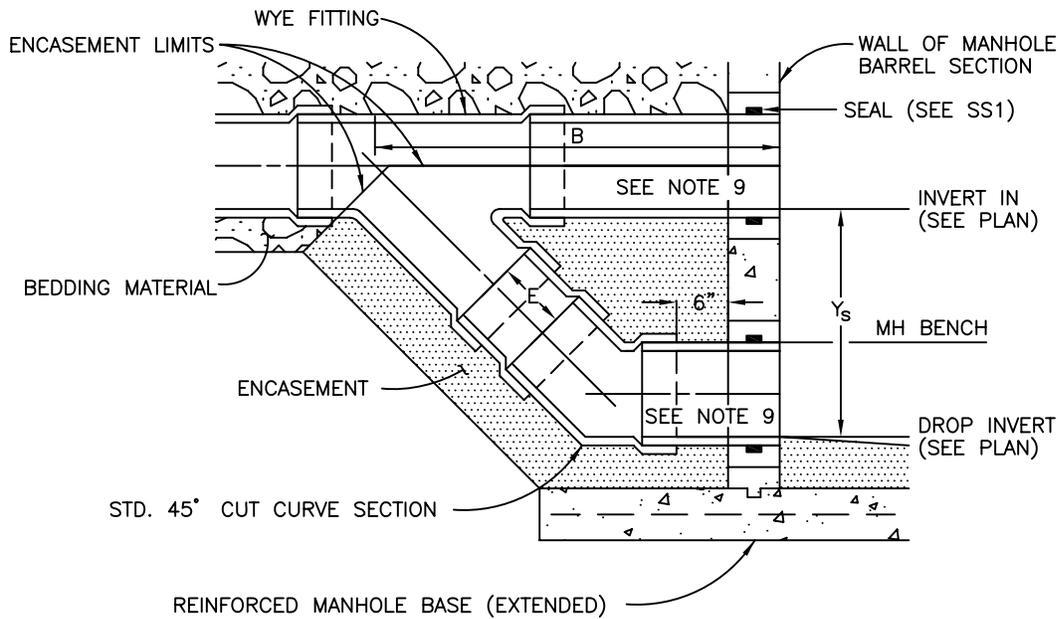
NOTE:
SEE DRAWING SS19 FOR DIMENSION TABLE AND GENERAL NOTES.





REINFORCED MANHOLE BASE (EXTENDED)

FOR CAST IRON OR
OUTSIDE DROP-DEEP: DUCTILE IRON



REINFORCED MANHOLE BASE (EXTENDED)

FOR CAST IRON OR
OUTSIDE DROP-SHALLOW: DUCTILE IRON

NOTE:
 SEE DRAWING SS19 FOR DIMENSION TABLE AND GENERAL NOTES.



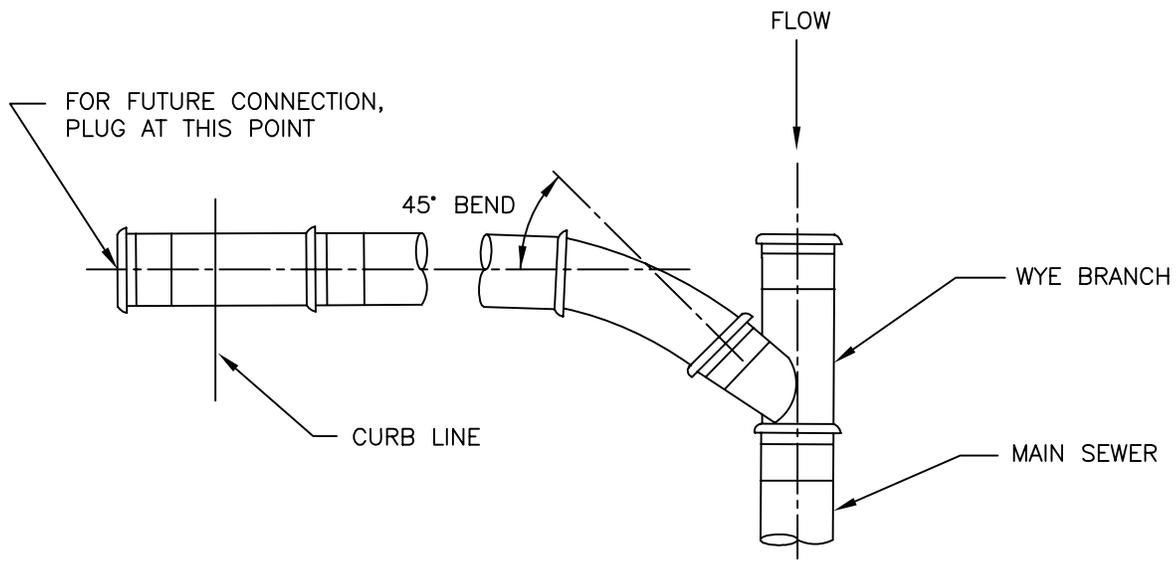
DIMENSIONS (NOMINAL)	A (INCHES)				B (INCHES)				γ_d (INCHES)				γ_s (INCHES)			
PIPE DIAMETER (INCHES)	8	10	12	15	8	10	12	15	8	10	12	15	8	10	12	15
DUCTILE IRON PIPE (DIP)	32	37	39	44	36	39	42	50	30	33	39	44	18	18	18	24
POLYVINYL CHLORIDE (PVC)	42	47	49	65	41	43	51	61	31	37	39	55	18	18	22	28

A MANHOLE OUTSIDE DROP IS NOT FEASIBLE FOR A DROP OF LESS THAN 18". THE ABOVE DIMENSIONS INDICATE ONLY THE MINIMUM DROP OBTAINABLE WITH AVAILABLE FITTINGS AND MATERIAL. GREATER DROPS THAN THIS ARE POSSIBLE BY ADDITION OF THE APPROPRIATE PIPE LENGTH AT DIMENSION E.

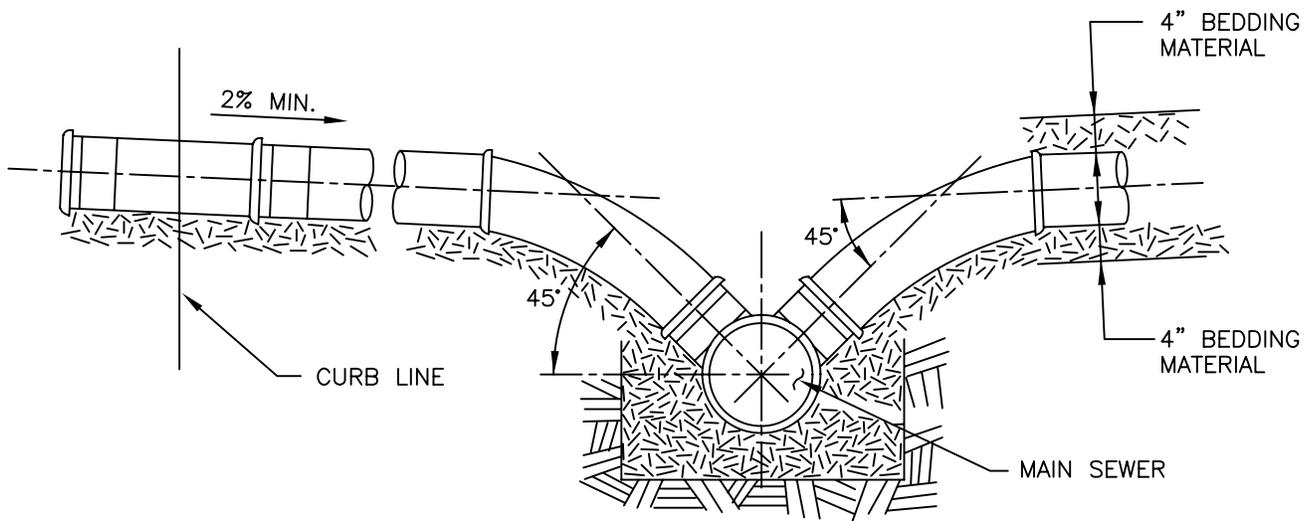
GENERAL NOTES:

1. ALL PIPE AND FITTINGS TO BE ASTM AND TOWN APPROVED.
2. FOR PAYMENT PURPOSES, ALL FITTINGS, PIPE, CONCRETE ENCASEMENT SHALL BE INCLUDED IN THE UNIT PRICE.
3. DIAMETER OF THE PIPE SHALL NOT BE LESS THAN MAIN LINE PIPE DIAMETER.
4. FOR 18" DIAMETER AND LARGER, OUTSIDE DROP SHALL BE A SPECIAL DESIGN.
5. THE APPROPRIATE MH SEAL, ADAPTOR OR CONNECTOR SHALL BE USED FOR THE SPECIFIED PIPE MATERIAL.
6. OUTSIDE DROP SHALL BE ALL OF ONE MATERIAL.
7. CONCRETE ENCASEMENT SHALL BE A MINIMUM OF 8" THICK ALL AROUND. CLASS II TYPE III – VIBRATED AND POURED MONOLITHIC WITH BASE.
8. PIPE DIMENSIONS ARE APPROXIMATE AND MAY VARY FROM ONE MANUFACTURER TO ANOTHER.
9. ALL REQUIRED WALL OPENINGS SHALL BE PRECAST BLOCK-OUTS OR CORE DRILLED. JACK HAMMERING OF OPENINGS IS NOT ALLOWED.





PLAN



ELEVATION



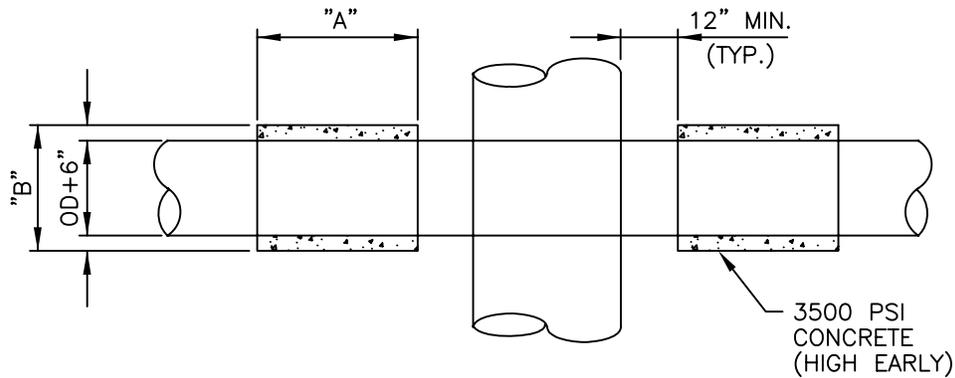
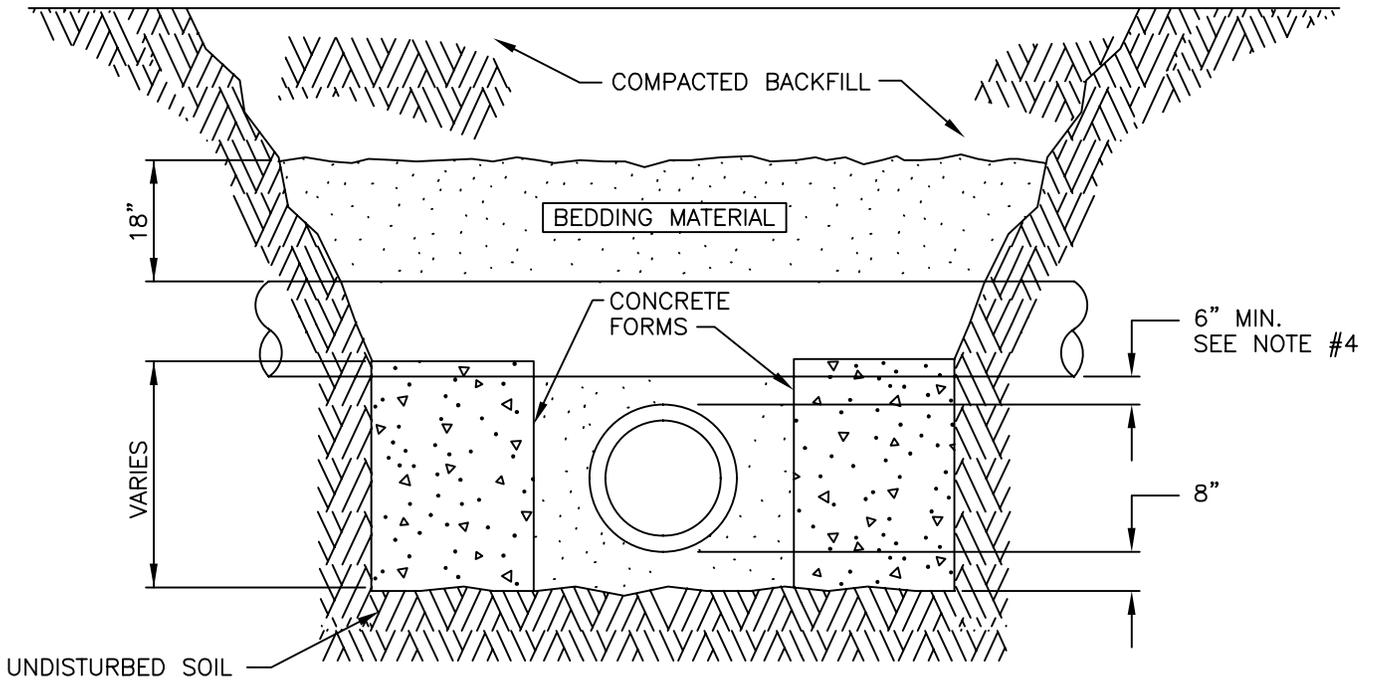
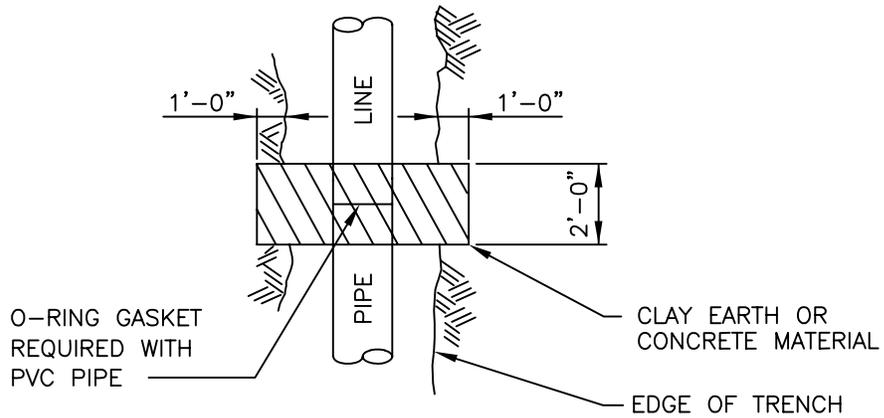


TABLE	
"A"	"B"
PIPES $\leq 12"$ = 12"	PIPE O.D. + 6" ON BOTH SIDES.
PIPES $> 12"$ = 18"	

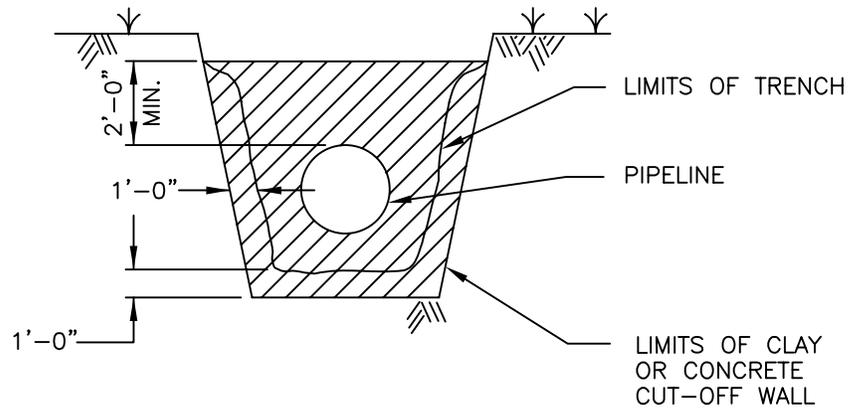
NOTES:

1. PIPE SECTIONS SHALL BE CENTERED OVER THE PIPE BEING CROSSED.
2. SIZES ABOVE 24" WILL BE DETERMINED BY THE ENGINEER.
3. A BOND BREAKER SHOULD BE PLACED BETWEEN THE CONCRETE AND THE PIPE BEING SUPPORTED.
4. IF THE CROSSING INVOLVES A WATER LINE AND THERE IS 6" OF CLEARANCE, OR THERE IS LESS THAN 4' OF COVER OVER THE UPPER PIPE, A FIBER BOARD INSULATION (DOW 2" EXTRUDED POLYSTYRENE IN ACCORDANCE WITH ASTM-C578 OR APPROVED EQUAL) MUST BE INSTALLED BETWEEN THE PIPES. THE BOARD SHOULD EXTEND 2' BEYOND THE OUTSIDE EDGES OF BOTH PIPES.





PLAN

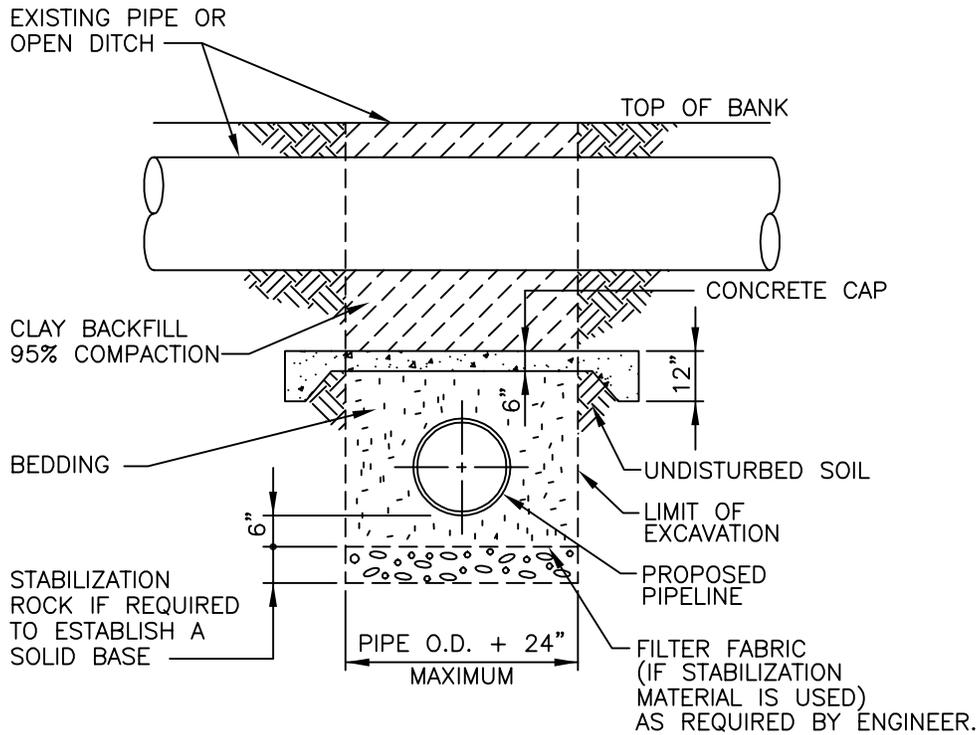


SECTION

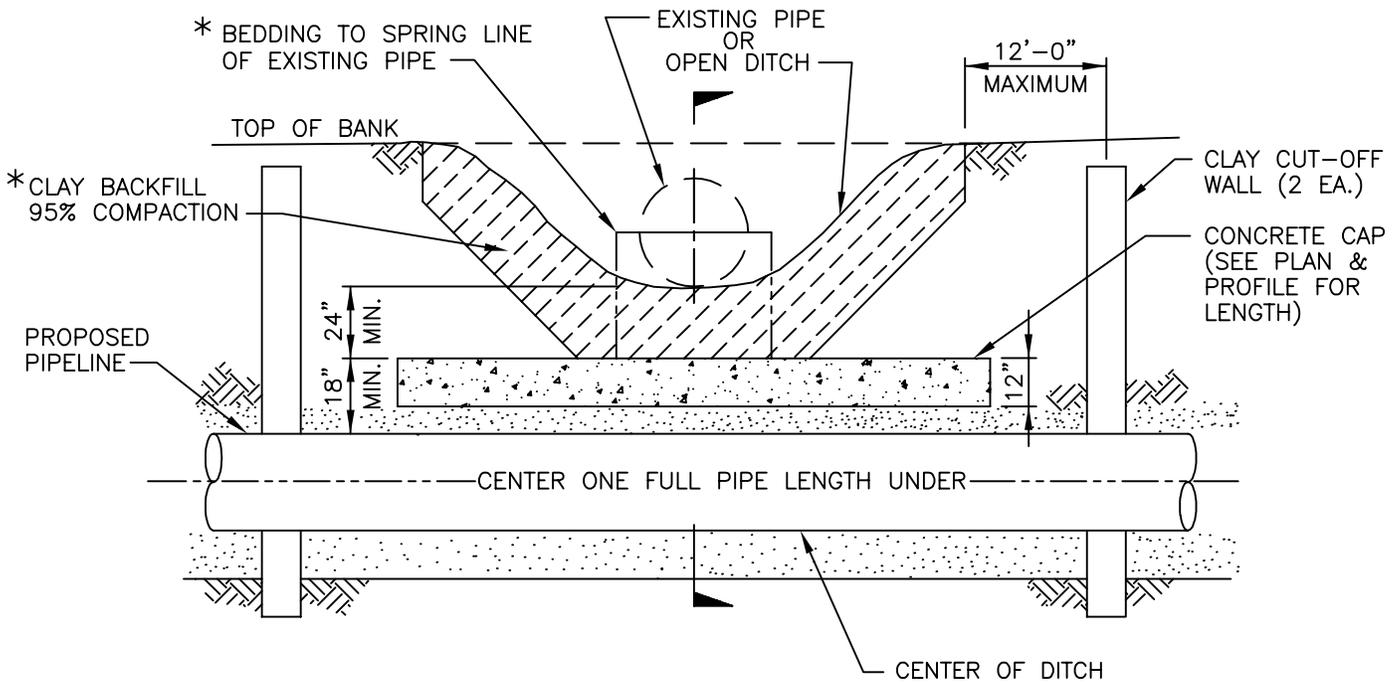
NOTES:

1. CLAY OR CONCRETE WALL EXTENDS A MINIMUM OF 12" INTO UNDISTURBED SOIL ON EACH SIDE AND ON BOTTOM OF TRENCH.
2. CLAY MATERIAL TO BE CLASSIFIED AS CL, CH, OR OH.
3. APPROVED FLOW-FILL MATERIAL MAY BE USED INSTEAD OF CLAY MATERIAL.





SECTION

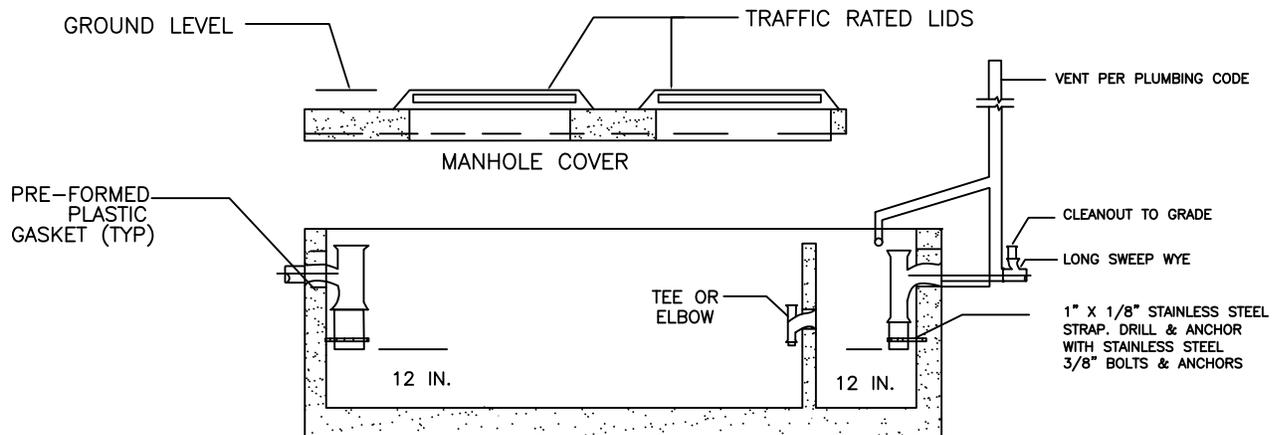
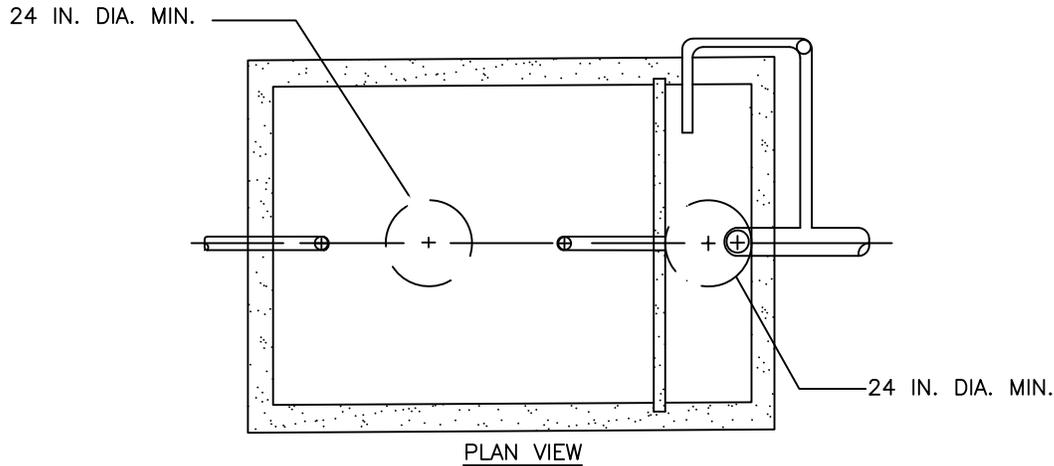


PROFILE

* USE CLAY BACKFILL ONLY WHEN CROSSING OPEN DITCH. USE BEDDING MATERIAL TO SPRING LINE OF EXISTING PIPE WHEN CROSSING PIPE.



TYPICAL GREASE INTERCEPTOR



NOTE:

1. SECONDARY OUTLET COMPARTMENT HAS VOLUME EQUAL TO 1/3 OF TOTAL CAPACITY.
2. CHECK WITH SUPPLIER FOR EXACT DIMENSIONS.
3. INTERCEPTORS TO BE SIZED BY DESIGN ENGINEER, SUBJECT TO DISTRICT APPROVAL.
4. GREASE INTERCEPTORS SHALL BE LOCATED ON PRIVATE PROPERTY AND SHALL BE EASILY ACCESSIBLE AT ALL TIMES, FOR MAINTENANCE AND INSPECTION.
5. INLET AND OUTLET SHALL HAVE SANITARY TEES; CENTER BAFFLE MAY HAVE TEE OR ELBOW.
6. INTERIOR PIPING TO BE SCHEDULED 40 PVC WITH STAINLESS STRAP, ANCHORING STRAP TO PIPE & WALL.

The Town of
ERIE
COLORADO



DRAWING TITLE: **GREASE INTERCEPTOR**

DRAWING NUMBER: **SS22**

DRAWN BY: **C. GERATY** APPROVED BY: **G. BEHLEN** REV. DATE: **01/2016**