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TIP PROJECT: R-2530B

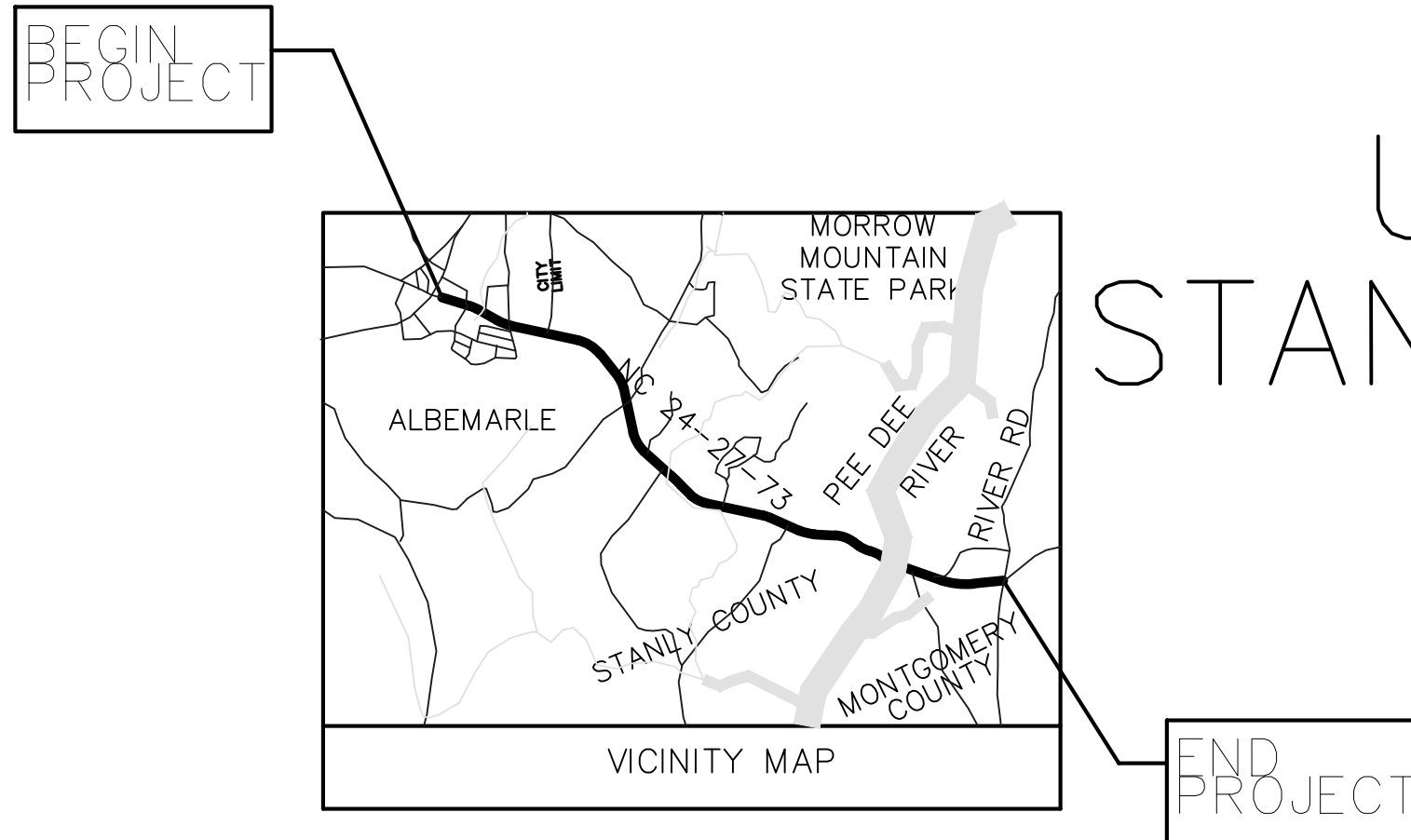
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

T.I.P. NO. R-2530B	SHEET NO. UC-1
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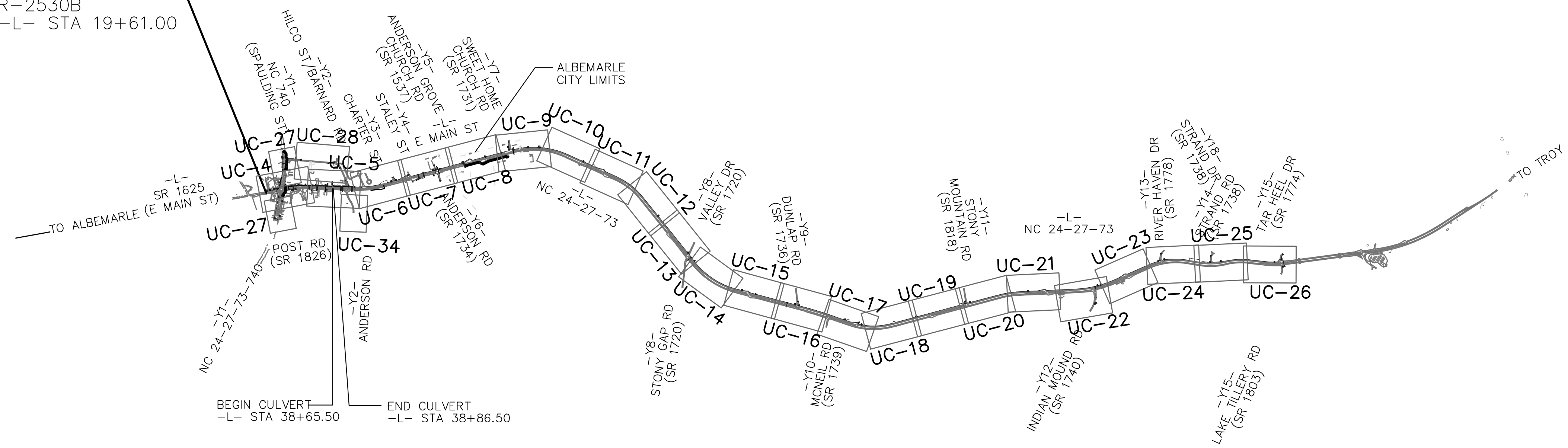
UTILITY CONSTRUCTION PLANS STANLY AND MONTGOMERY COUNTY

LOCATION: NC 24-27 FROM NC 740 IN ALBEMARLE
TO EAST OF THE PEE DEE RIVER

TYPE OF WORK: UTILITY CONSTRUCTION



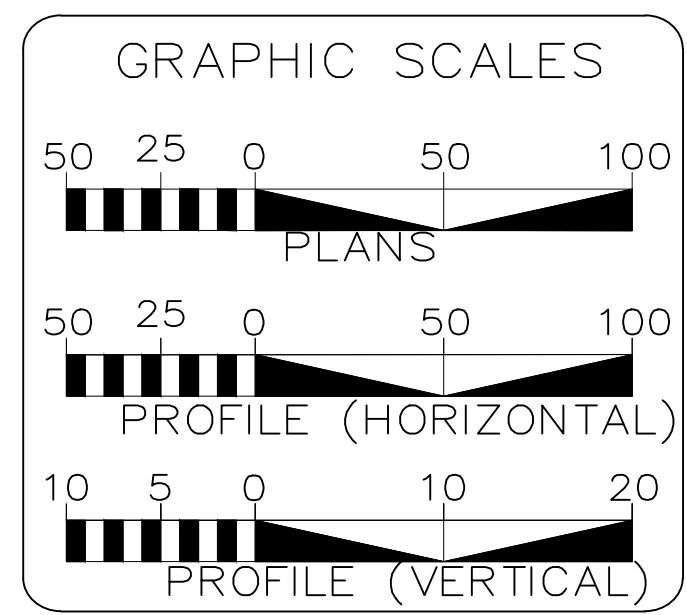
BEGIN TIP PROJECT
R-2530B
-L- STA 19+61.00



BEGIN CULVERT
-L- STA 38+65.50

END CULVERT
-L- STA 38+86.50

DOCUMENT NOT CONSIDERED FINAL
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SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY PLAN SHEET SYMBOLS
UC-3	SITE CONSTRUCTION NOTES
UC-3A THRU UC-3F	DETAILS
UC-4 THRU UC-28	UTILITY CONSTRUCTION PLAN SHEETS
UC-29 THRU UC-59	PROFILE SHEETS
UC-60 THRU UC-64	PUMP STATION SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER - CITY OF ALBEMARLE
(B) SANITARY SEWER - CITY OF ALBEMARLE
(C) WATER - COUNTY OF STANLY

chambers
engineering, pa

129 North First Street | 704.984.6427 ph
Albemarle, NC 28001 | www.ce-pa.com

STEPHEN CHAMBERS, PE CONSULTANT CONTACT #1
RACHEL CARTER, EI CONSULTANT CONTACT #2
SAMUEL SMITH, PE CONSULTANT CONTACT #3

SEAL

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

MICHAEL BRIGHT UTILITIES REGIONAL ENGINEER
DONALD HAMPTON UTILITIES ENGINEER
AMY DUPREE UTILITIES AREA COORDINATOR
STEVE TREXLER UTILITIES COORDINATOR

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS UTILITIES PLAN SHEET SYMBOLS

PROJECT REFERENCE NO. R-2530B	SHEET NO. UC-2
DESIGNED BY: RCC	
DRAWN BY: RCC	
CHECKED BY: SGC	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION 129 North First Street 704.984.6427 ph Albemarle, NC 28001 www.ce-pa.com	
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PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) 12" WL
- 11.25 Degree Bend
- 22.50 Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Gate Valve
- Coupling
- Cut-In Valve
- Tapping Sleeve & Valve
- Blow Off
- Fire Hydrant
- Remove Fire Hydrant
- Master Meter
- Water Meter
- Reconnect to Existing Meter
- Remove Water Meter
- RPZA Backflow Preventer
- Relocate RPZA Backflow Preventer

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

- Trenchless Installation
- Encasement by Open Cut
- Encasement
- Thrust Block

- Air Release Valve
- Utility Vault
- Plan Note
- Pay Item Note

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Water Manhole
- Power Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- TV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- End of Information

- *Underground Power Line
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- *Underground Water Line
- *Underground Gravity Sanitary Sewer Line
- Underground SS Forced Main Line
- *Underground Unknown Utility Line
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) 12" SS
- Force Main Sewer Line (Sized as Shown) 12" FSS
- Manhole (Sized per Note)
- Sewer Lateral
- Sewer Clean-out

*For Existing Utilities
 Utility Line Drawn from Record (Type as Shown)
 Designated Utility Line (Type as Shown)

SITE CONSTRUCTION NOTES:

PROJECT REFERENCE NO. R-2530B	SHEET NO. UC-3
DESIGNED BY: RCC	
DRAWN BY: RCC	
CHECKED BY: SGC	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION	
129 North First Street 704.984.6427 ph Albemarle, NC 28001 www.ce-pa.com	
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NCDOT GENERAL NOTES:

1. THE EXISTING UTILITIES BELONG TO THE CITY OF ALBEMARLE OR STANLY COUNTY.
2. THE PROPOSED UTILITY CONSTRUCTION IN THE CITY OF ALBEMARLE AND STANLY COUNTY SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT AND THE UTILITY OWNER. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND A MINIMUM OF ONE WEEK PRIOR TO SERVICE INTERRUPTIONS AND TESTING. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.
6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE OF MATERIAL OF EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, "SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY ASSOCIATED WITH THE WORK UNDER THIS PROJECT AND FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL HEALTH AND SAFETY LAWS, CODES, REGULATIONS, AND ORDINANCES INCLUDING BUT NOT LIMITED TO THOSE CURRENTLY MANDATED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ENGINEER WITH A SET OF SURVEY RECORD (AS-BUILT) DRAWINGS. THESE DRAWINGS SHALL AT A MINIMUM SHOW THE FINAL LOCATION OF ALL INSTALLED FACILITIES.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL LIVESTOCK/FARM ANIMALS AND OPERATIONS RELATED TO THESE DURING CONSTRUCTION. ALL FENCING NECESSARY TO ISOLATE ANIMALS FROM CONSTRUCTION ACTIVITIES TO BE THE RESPONSIBILITY OF THE CONTRACTORS.

NCDOT PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE SHALL BE PVC C900 DR-18, RJD CLASS 350 (RESTRAINED JOINT DUCTILE IRON), AND HDPE DR-9 (FOR HORIZONTAL DIRECTIONAL DRILL (HDD)) AS INDICATED ON THE CONSTRUCTION DRAWINGS. PROPOSED SEWER FORCE MAIN SHALL BE PVC C900 DR-18, RJD CLASS 350 WITH CERAMIC-EPOXY INTERIOR PIPE LINING AS APPROVED BY THE CITY OF ALBEMARLE, AND FUSIBLE PVC C900 (FOR HDD) AS INDICATED ON THE CONSTRUCTION DRAWINGS.
2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS AND APPLICABLE CITY OF ALBEMARLE AND STANLY COUNTY STANDARDS CONCERNING TRENCHLESS INSTALLATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE PRE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
3. IF HDPE PIPE IS INSTALLED BY DIRECTIONAL DRILL, IT SHALL BE FILLED WITH WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR ONE WEEK FOR THE TIME OF INSTALLATION. THE INNER DIAMETER OF THE WATER PIPE INSTALLED BY TRENCHLESS INSTALLATION MUST BE AT LEAST AS LARGE AS THE WATER LINE IT IS CONNECTED TO.
4. TRACER WIRE AND WARNING TAPE SHALL BE INSTALLED WITH ALL PLASTIC PIPE UTILITIES. WIRE, TAPE, AND PIPE SHALL BE COLOR CODED ACCORDING TO UTILITY (BLUE FOR WATER, GREEN FOR SEWER) AND SHALL BE IN ACCORDANCE WITH NCDOT SPECIFICATIONS.
5. EXISTING CONDITIONS SURVEY AND PROPOSED ROADWAY PLANS PROVIDED TO CHAMBERS ENGINEERING BY NCDOT, 12/29/17.
6. ALL DUCTILE IRON PIPE USED FOR SEWER FORCE MAIN INSTALLATIONS SHALL BE LINED WITH CERAMIC-EPOXY INTERIOR PIPE LINING AS APPROVED BY THE CITY OF ALBEMARLE.
7. FUSED PVC PIPE LENGTHENS THAT HAVE BEEN INSTALLED IN THE TRENCH SHALL NOT BE BENT OR JOCKEYED INTO POSITION WITH HEAVY EQUIPMENT IN ORDER TO CONNECT TO FITTINGS. ALL ALIGNMENTS CORRECTIONS SHALL TAKE PLACE IN THE DIP FITTINGS.
8. ALL WATER LINE SHALL BE CONSTRUCTED +/-10' FROM EDGE OF PAVEMENT UNLESS NOTED OTHERWISE.
9. IF REQUIRED BY PROPERTY OWNERS, THE CONTRACTOR SHALL CUT ALL TREES WITHIN EASEMENT LIMITS OF 8 FT. LENGTHS AND STACK IN CORDS ON UPSTREAM SIDE OF EASEMENT.
10. ALL SANITARY SEWER LATERALS WERE FIELD LOCATED, SITE VERIFY BEFORE CONSTRUCTION.
11. SIZE OF WATER METERS NOT SURVEYED, CONTRACTOR SHALL FIELD VERIFY AND REPLACE/RELOCATE METERS TO MATCH EXISTING.

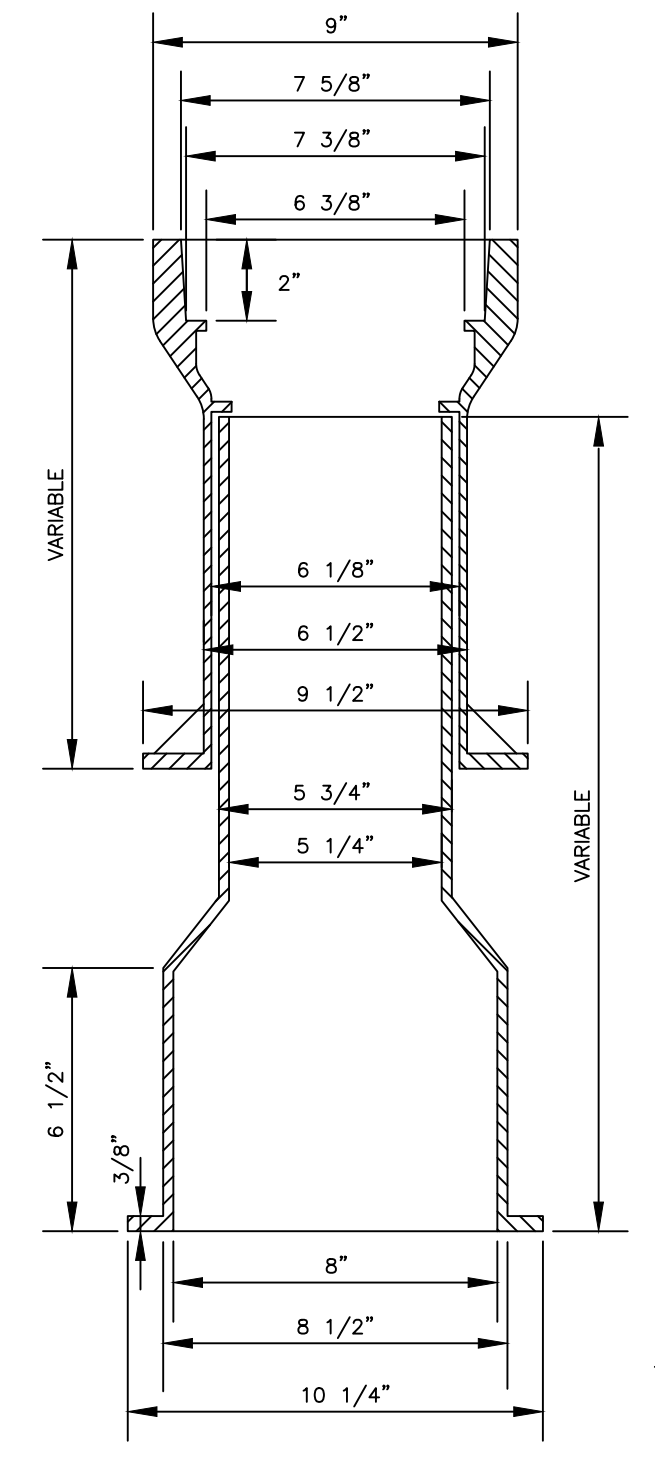
PROJECT REFERENCE NO. R-2530B	SHEET NO. UC-3A
DESIGNED BY: RCC	
DRAWN BY: RCC	
CHECKED BY: SGC	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

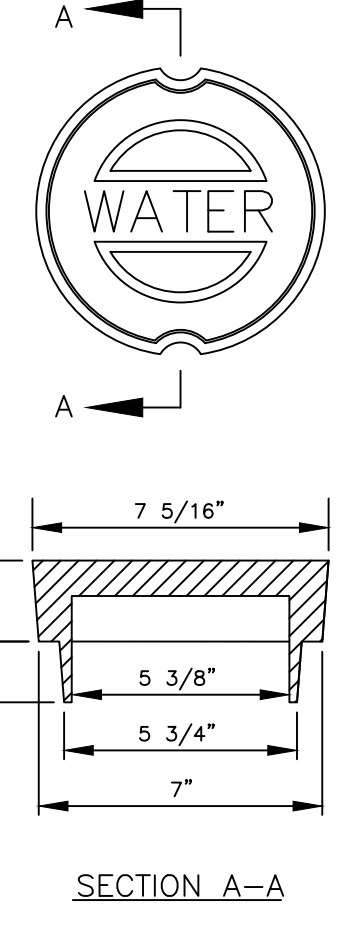
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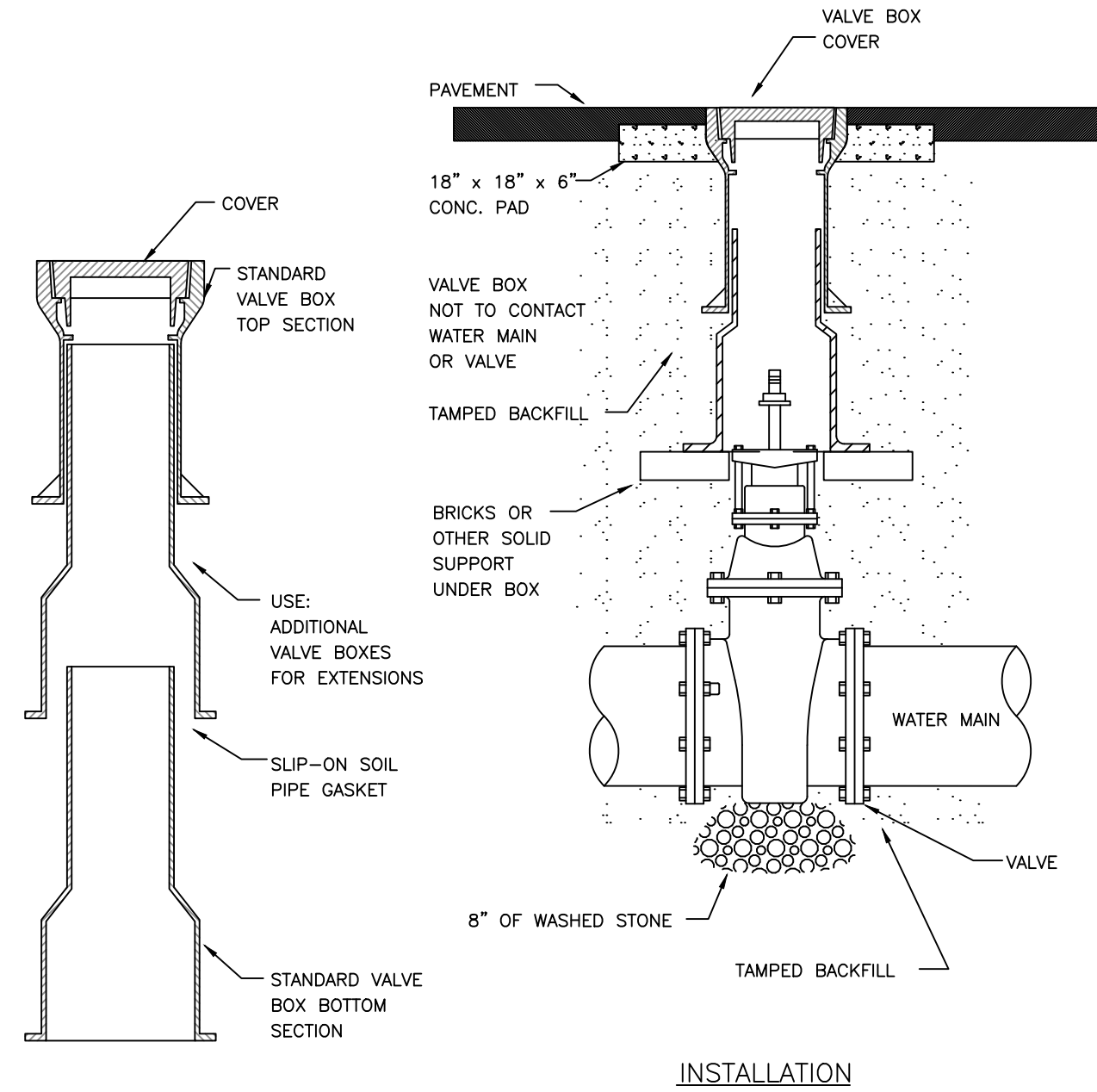


VALVE BOX DETAIL
NO SCALE



SECTION A-A

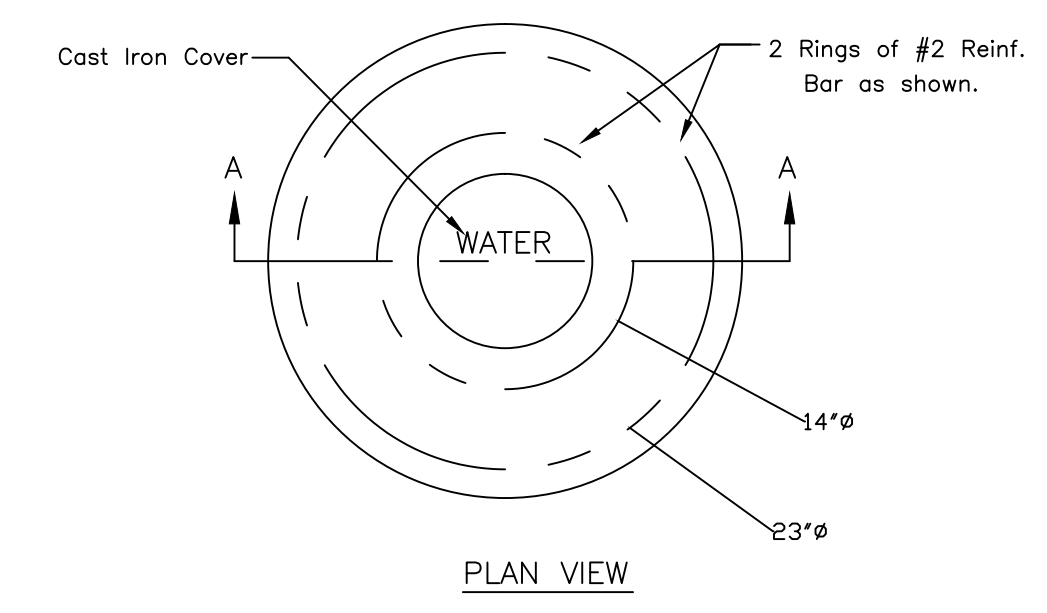
NOTE:
BOX IS TYLER, OR EQUAL
CAST IRON VALVE BOX



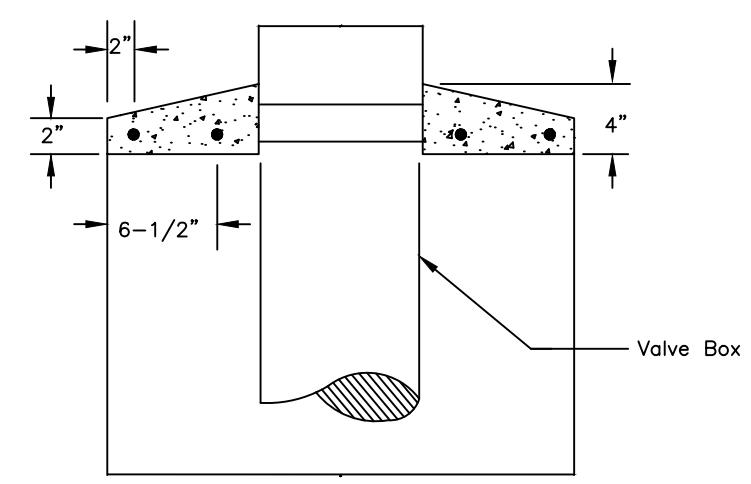
INSTALLATION

EXTENSION

VALVE BOX INSTALLATION DETAIL
NO SCALE

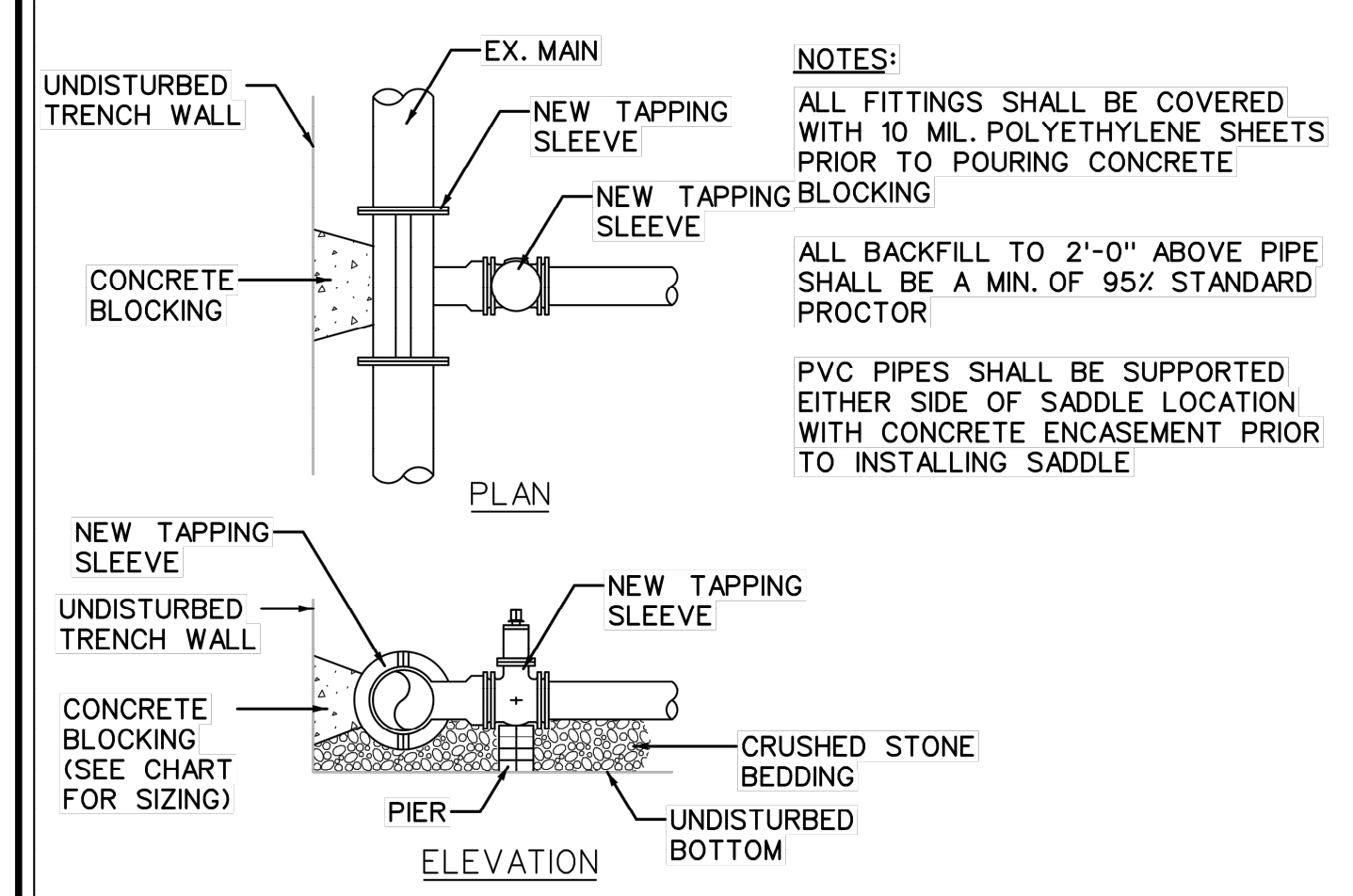


PLAN VIEW



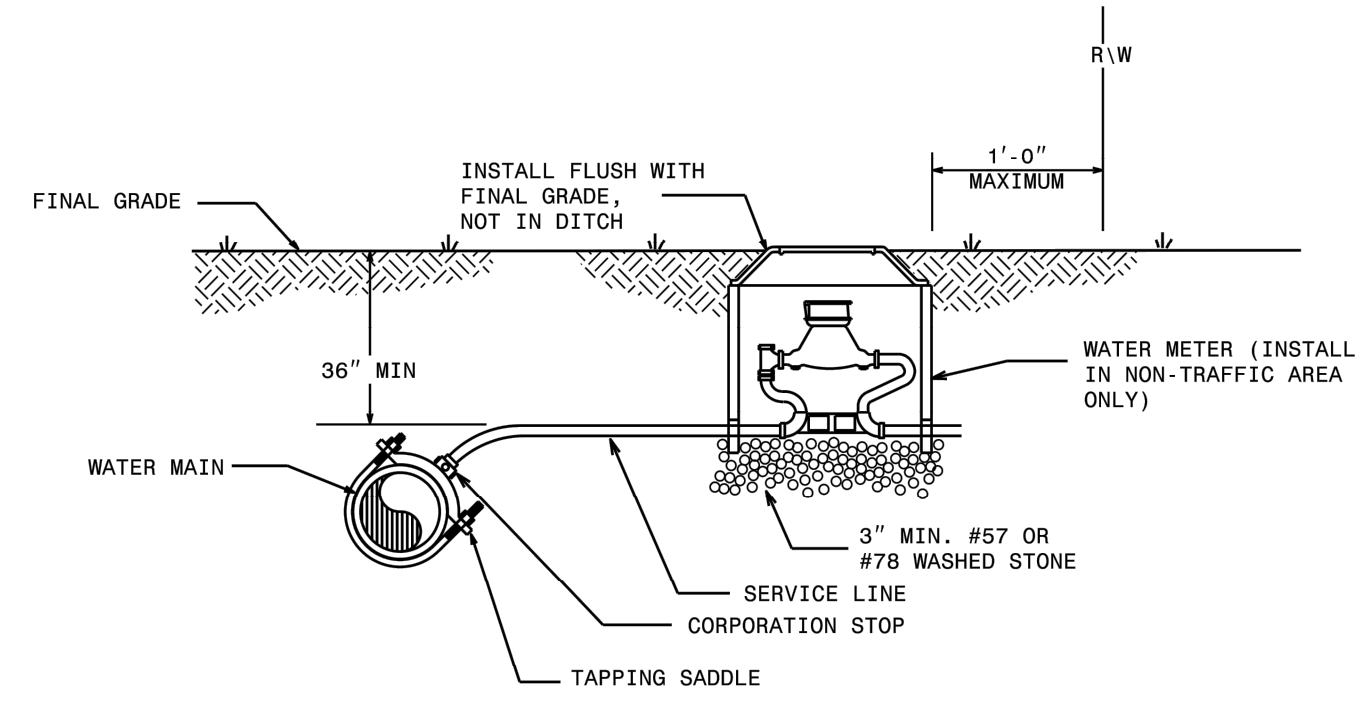
SECTION VIEW A-A

VALVE PROTECTION RING
NO SCALE



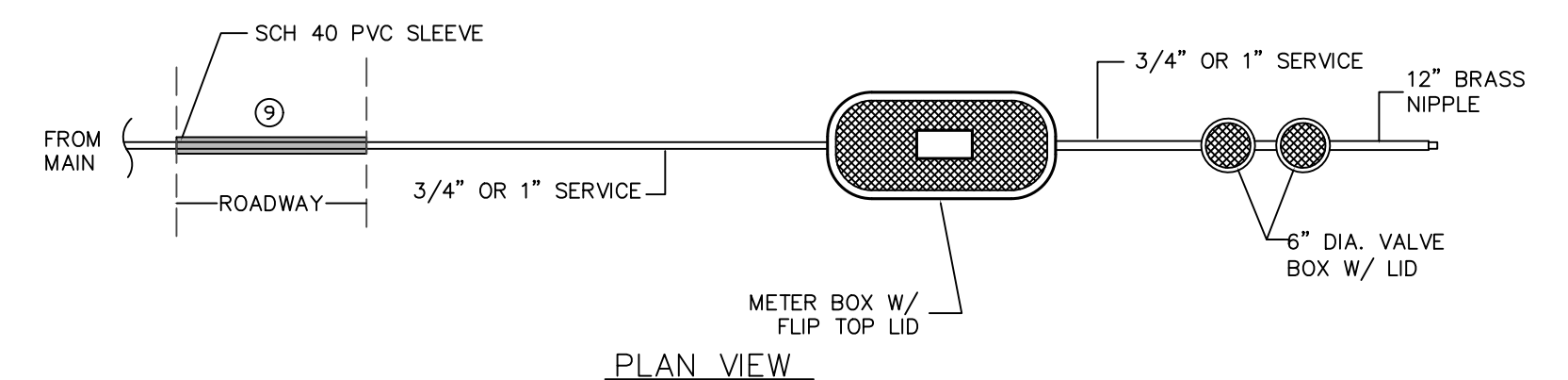
TAPPING SLEEVE AND VALVE
NOT TO SCALE

NOTES:
ALL FITTINGS SHALL BE COVERED WITH 10 MIL. POLYETHYLENE SHEETS PRIOR TO POURING CONCRETE.
ALL BACKFILL TO 2'-0" ABOVE PIPE SHALL BE A MIN. OF 95% STANDARD PROCTOR.
PVC PIPES SHALL BE SUPPORTED EITHER SIDE OF SADDLE LOCATION WITH CONCRETE ENCASEMENT PRIOR TO INSTALLING SADDLE.

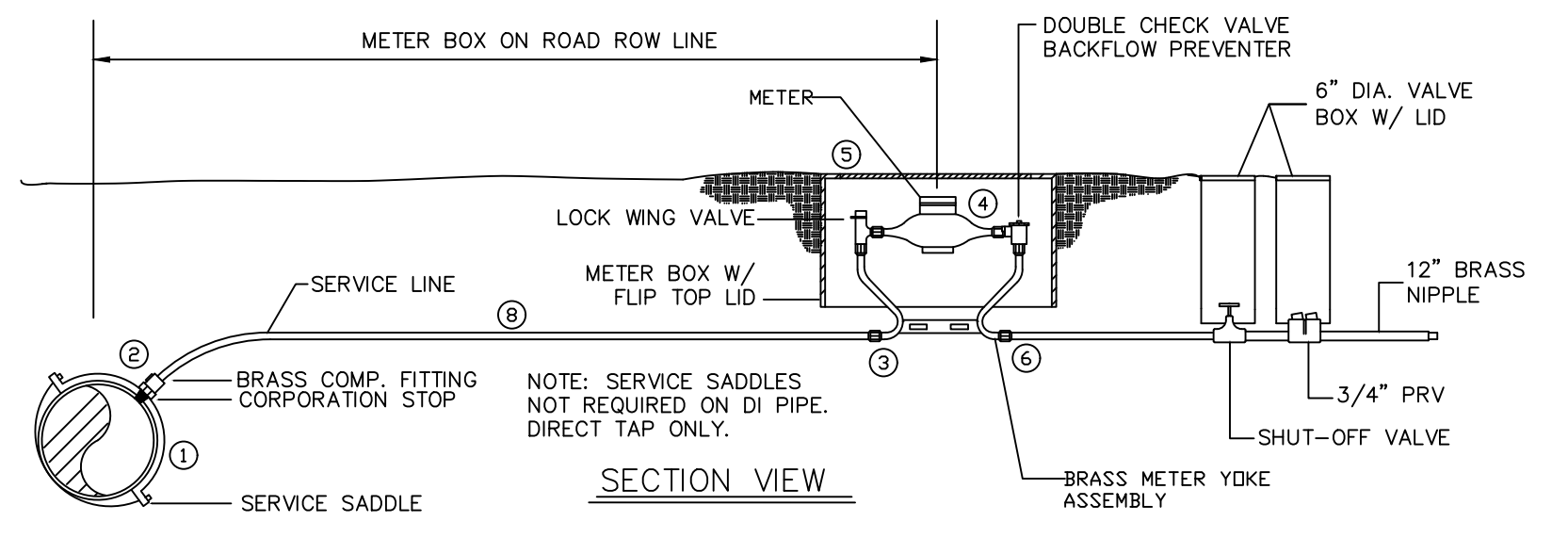


NOTES:
1. THIS DETAIL SHOWS THE TYPICAL FINAL WATER METER CONFIGURATION AFTER INSTALLATION OF A PROPOSED WATER METER, RECONNECTION OF AN EXISTING WATER METER, OR RELOCATION OF A WATER METER.
2. ALL CITY OF ALBEMARLE SERVICES SHALL BE DIRECT TAP.

ROADWAY STANDARD DRAWING FOR
WATER METER
 SHEET 1 OF 1
1515.01



PLAN VIEW



SECTION VIEW

- ① BRASS TAPPING SADDLE - 3/4" 1" FORD S-70-203 FORD S-70-203 (EQUAL ROMAC & MUELLER MODELS ARE ACCEPTABLE)
REQUIRED FOR TAPS ON ALL EXISTING 2" PVC & GALVANIZED PIPE. AWWA THREAD
- ① TAPPING SADDLE - SMITH BLAIR TYPE 313 SMITH BLAIR TYPE 313 (EQUAL ROMAC & MUELLER MODELS ARE ACCEPTABLE)
ALL OTHER PIPE
- ② CORPORATION COCK - FORD F-1000 FORD F-1000 (EQUAL MUELLER & HAYES MODELS ARE ACCEPTABLE)
INLET AWWA THREAD OUTLET OF FJ
- ③ METERSSETTER - FORD V-172-7 FORD V-174-10 (EQUAL EJ PRESCOTT & MUELLER MODELS ARE ACCEPTABLE)
INLET: COPPERTUBE PACK JOINT OUTLET: MALE IRON PIPE THREAD
- ④ METER - PROVIDED BY OWNER
- ⑤ METER BOX - IN GRASS: BROOKS 1419 - 18" DEEP (EQUAL JONES & NDS MODELS ARE ACCEPTABLE)
W/ CAST IRON METER IN SIDEWALKS: BROOKS 37H - 12" DEEP W/ 12" EXTENSION READING LID IN TRAFFIC AREAS (WITH APPROVAL) BROOKS - TRAFFIC
- ⑥ TEMPORARY BRASS PLUG - FOR SERVICES NOT TO BE IMMEDIATELY CONNECTED
- ⑦ ALL ITEMS AS SPECIFIED OR APPROVED EQUAL
- ⑧ SDR 9 CTS POLY. ALL COMPRESSION FITTINGS
- ⑨ SCH 40 PVC SLEEVE FOR ALL LONG SIDE WATER SERVICE CONNECTIONS

STANLY COUNTY 3/4" & 1" WATER METER DETAIL

NO SCALE

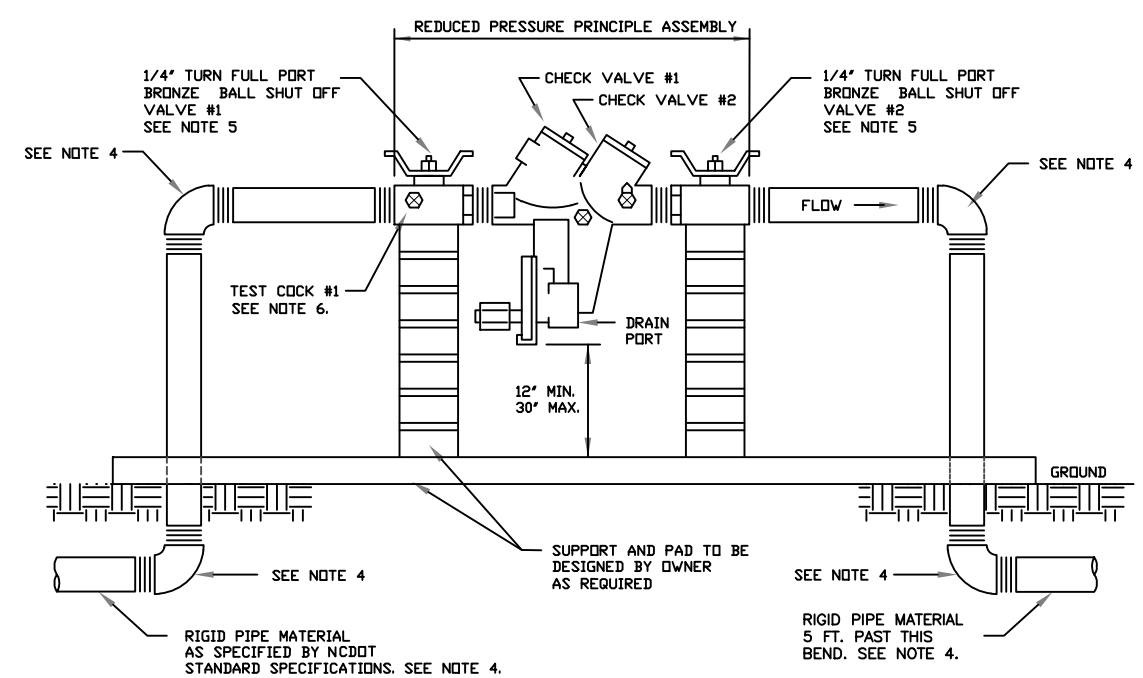
PROJECT REFERENCE NO.	SHEET NO.
R-2530B	UC-3B
DESIGNED BY: RCC	
DRAWN BY: RCC	
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

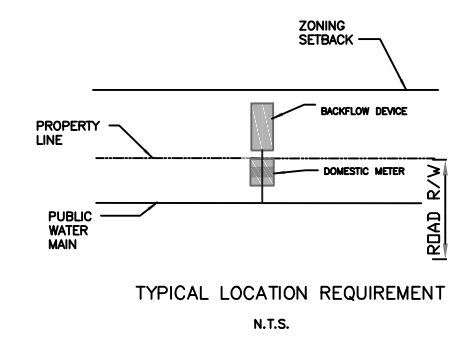


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- NOTES:
- REDUCED PRESSURE ASSEMBLIES (RPA) MUST CONFORM TO SPECIFICATIONS.
 - A 4-INCH THICK CONCRETE PAD SHALL BE PROVIDED. SUPPORT PEDESTALS SHALL BE PROVIDED AS NEEDED. SUPPORT PEDESTALS SHALL NOT BLOCK RELIEF VALVE OR DRAIN PORT.
 - PROTECTIVE ENCLOSURE SHALL CONFORM WITH ASSOCIATED AND SHALL BE IN ACCORDANCE WITH ASSOCIATED ORDINANCE AND SPECIFICATIONS.
 - RIGID PIPE AND FITTINGS SHALL BE 3/4" TO 2" BRASS, K-COPPER, OR GALVANIZED PIPE.
 - APPROVED 3/4" TO 2" RP INCLUDES SHUT OFF VALVE #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
 - TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.

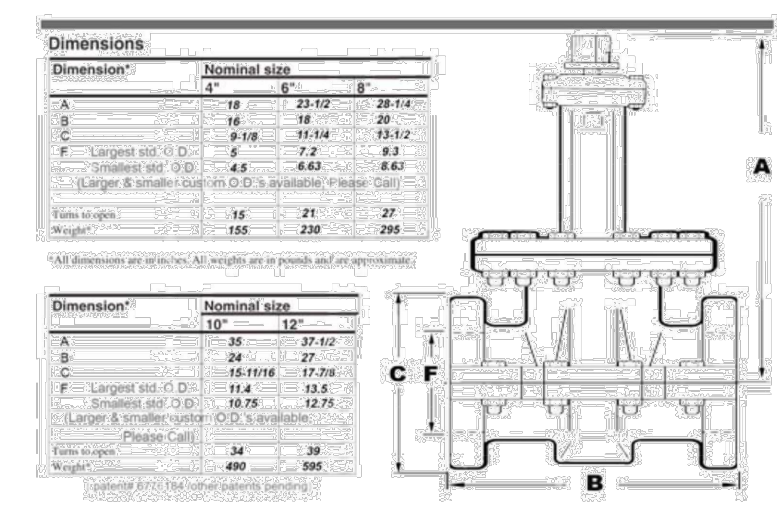


ABOVE GROUND 3/4" TO 2" REDUCED PRESSURE ASSEMBLY
NO SCALE

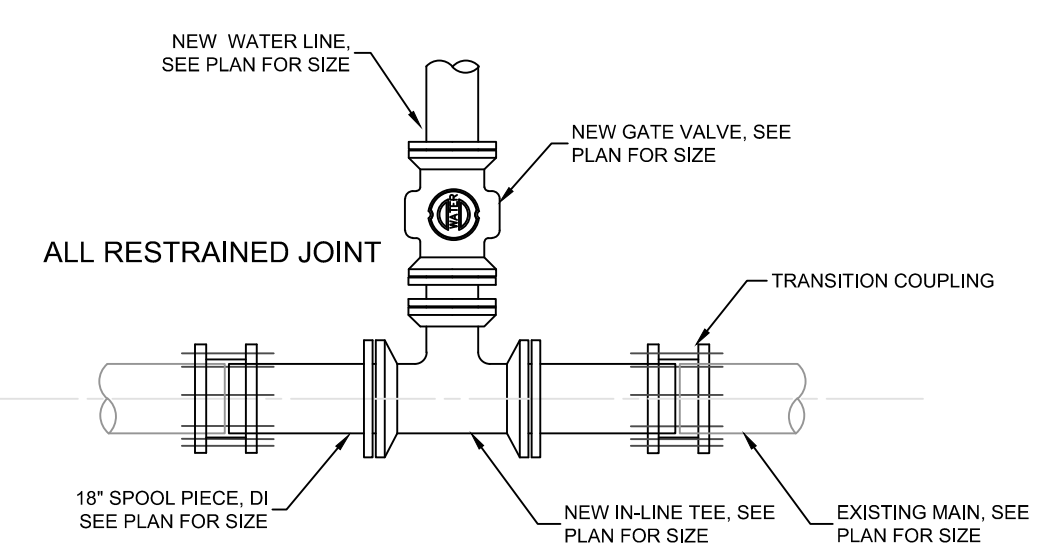
INSERT VALVE

This InsertValve™ with Resistant Seal Gate, from start to finish. Made in the USA.

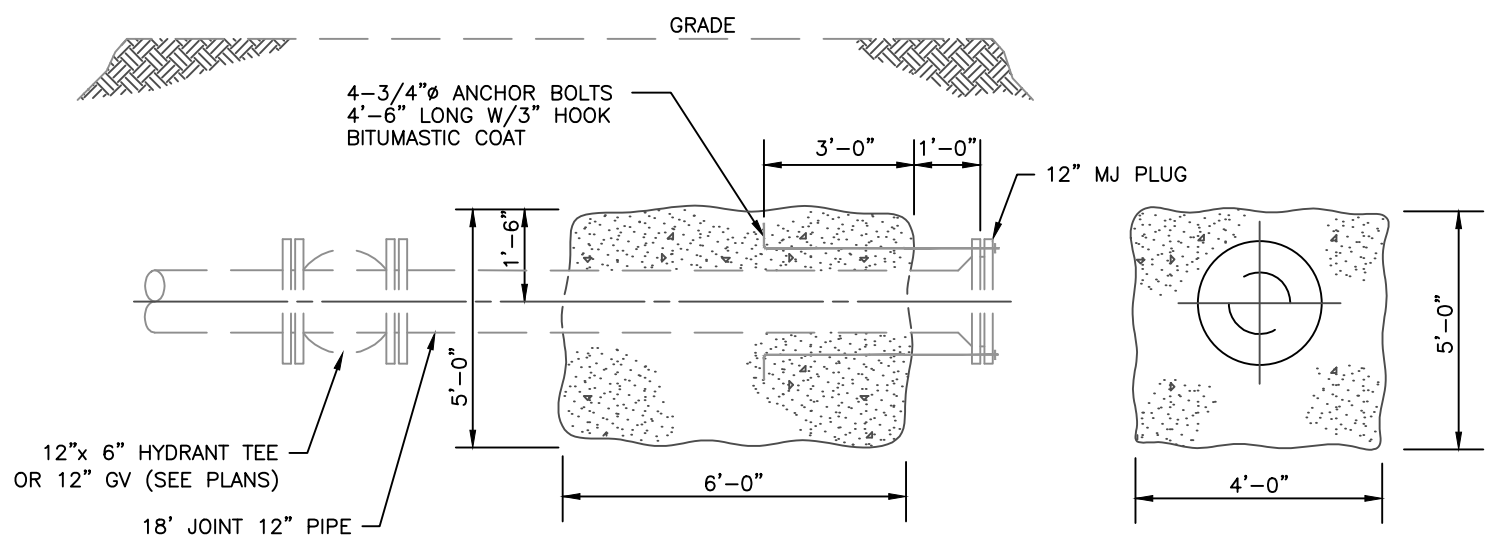
- Sizes - 4", 6", 8", 10", 12" Water & Sewer Applications
- Standard valve body (casts on Steel, PVC, C-900, Cast-Iron) Ductile-iron and class 150 A/C pipe without modifications.
- 2" square wrench nut (Optional Hand-wheel) open left or open right Non-rising stem (NRS)
- Meets or exceeds ANSII/AWWA C515 Standards
- Ductile iron body with nominal 10 mils Epoxy Coated
- Epoxy coating meets or exceeds ANSII/AWWA C550 Standards and ANSII/SP-61
- Iron wedge, encapsulated with molded rubber
- Triple O-ring seal stuffing box (2 upper & 1 lower O-rings)
- 4"-12" sizes - 250 psig (1723 kPa) maximum working pressure



*VALVE SHALL BE INSERTA VALVE OR APPROVED EQUAL
*SHOWN AS TV ON PLANS

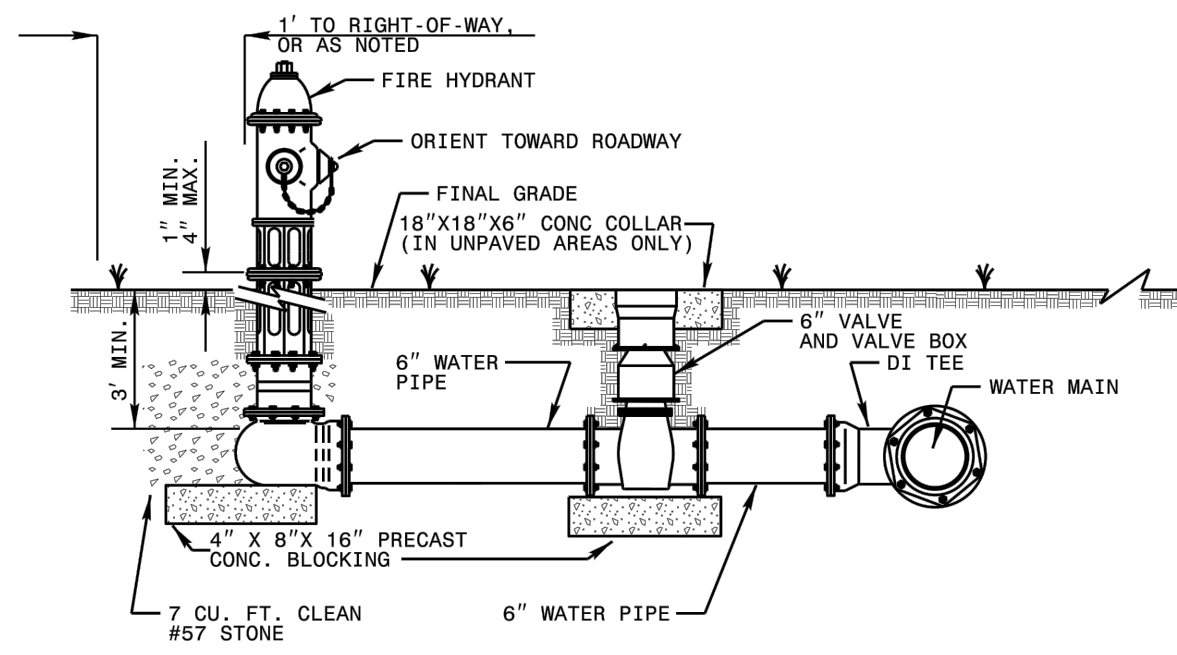


CUT-IN TEE DETAIL
NO SCALE

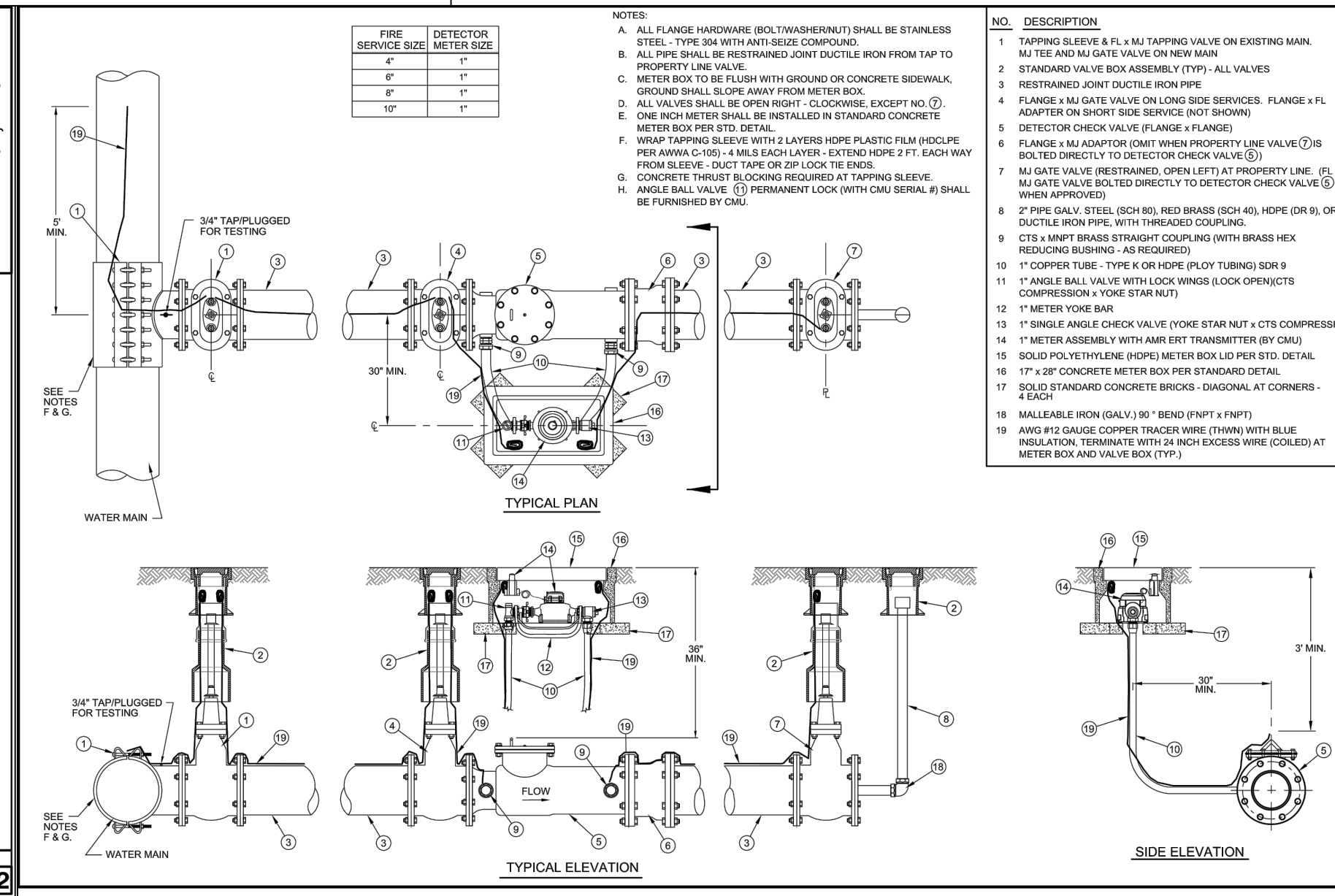


PLUG BLOCKING DETAIL
NO SCALE

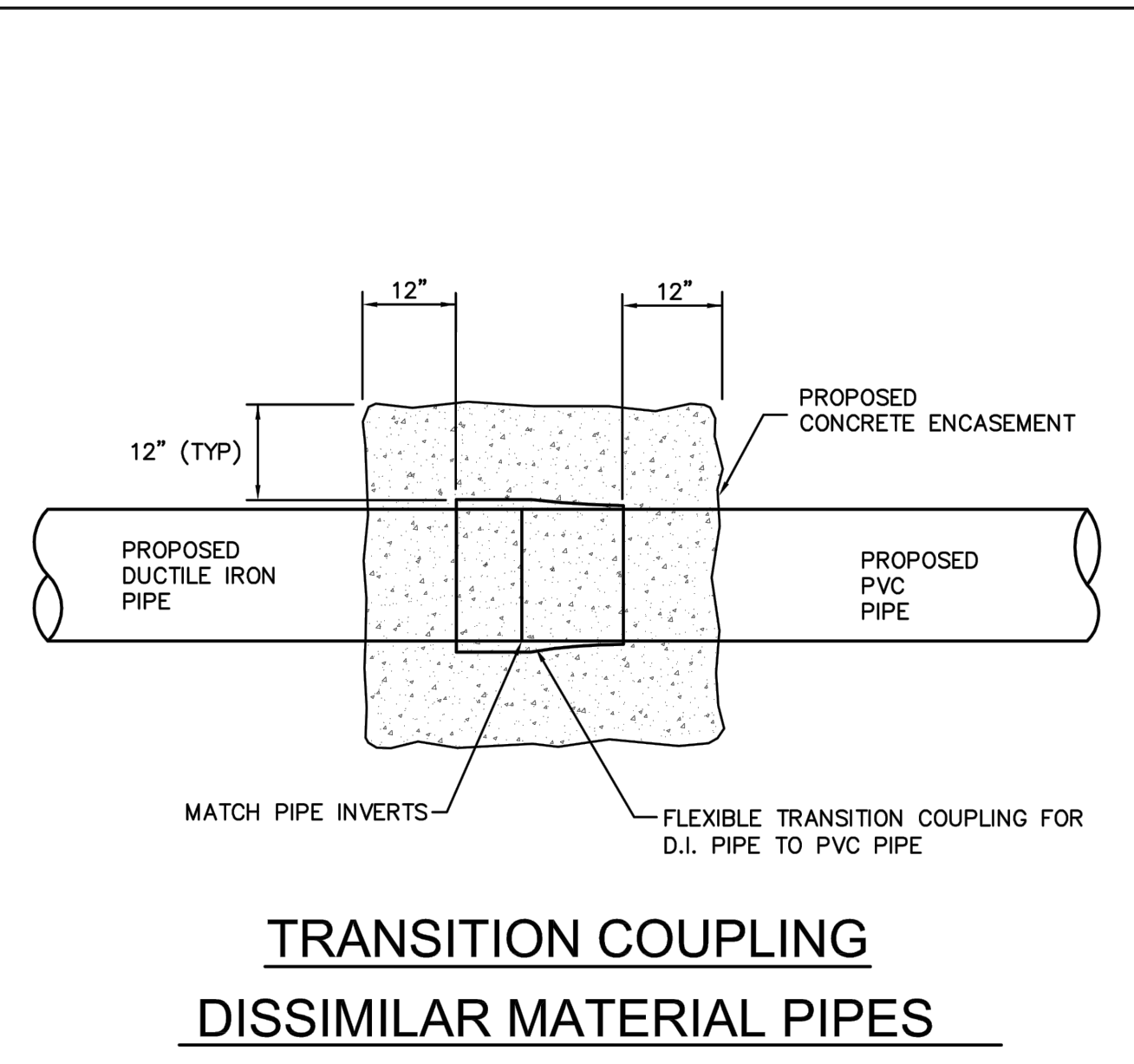
- NOTES:
- THIS DETAIL SHOWS THE TYPICAL FINAL FIRE HYDRANT CONFIGURATION AFTER INSTALLATION OF A PROPOSED FIRE HYDRANT, RECONNECTION OF AN EXISTING FIRE HYDRANT, OR RELOCATION OF A FIRE HYDRANT.
 - KEEP DRAIN PORTS FREE FROM OBSTRUCTION.
 - RESTRAIN ALL PIPE JOINTS AND FITTINGS. ACCEPTABLE TYPES OF RESTRAINT INCLUDE RESTRAINING GLANDS, RESTRAINED, PUSH-ON JOINTS, AND 3/4" BITUMINOUS COATED, ALL-THREAD RESTRAINING RODS. THRUST BLOCKS ARE NOT AN ACCEPTABLE TYPE OF RESTRAINT.
 - FOR RELOCATED OR RECONNECTED FIRE HYDRANTS, VERIFY THE VALVE IS RESTRAINED TO THE MAIN. PROVIDE APPROPRIATE RESTRAINT.
 - HYDRANT LOCATION APPLIES TO PROPOSED AND RELOCATED FIRE HYDRANTS.
 - LOCATE FIRE HYDRANT WITH 3' HORIZONTAL CLEARANCE FROM ABOVE GROUND OBJECTS.
 - PROVIDE A MINIMUM OF 3' COVER OVER ALL SECTIONS OF HORIZONTAL PIPE. USE FITTINGS AS NECESSARY.
 - TAPPING SLEEVES MAY BE USED ON EXISTING MAINS IN LIEU OF DI TEES.
 - LOCATE FIRE HYDRANT OUTSIDE OF THE VEHICLE RECOVERY AREA, ADJACENT TO THE R/W LINE, OR IN A PROTECTED AREA.



ROADWAY STANDARD DRAWING FOR
FIRE HYDRANT
SHEET 1 OF 1
1515.02



4" - 10" FIRE LINE SERVICE DETECTOR METER ASSEMBLY
N.T.S.



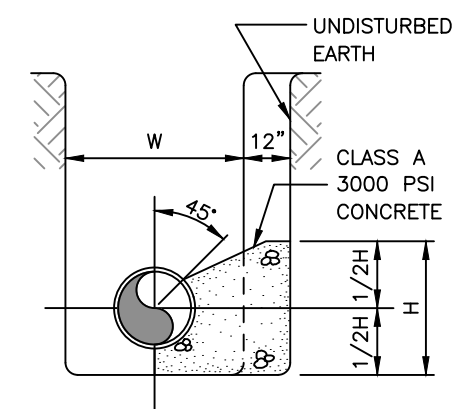
TRANSITION COUPLING DISSIMILAR MATERIAL PIPES

PROJECT REFERENCE NO.	R-2530B	SHEET NO.	UC-3C
DESIGNED BY:	RCC		
DRAWN BY:	RCC		
CHECKED BY:	SGC		
APPROVED BY:			
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UTILITY CONSTRUCTION

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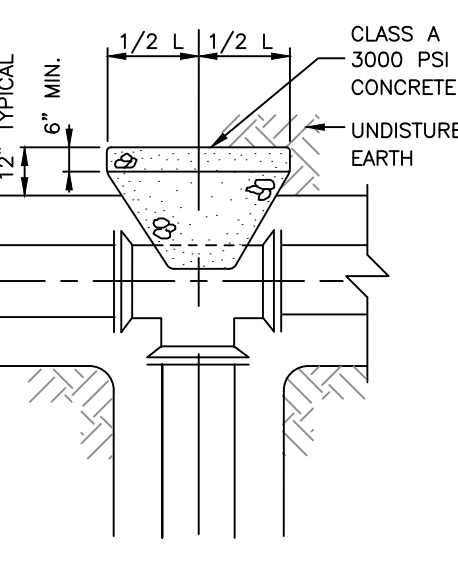


TYPICAL SECTION TEE OR BEND

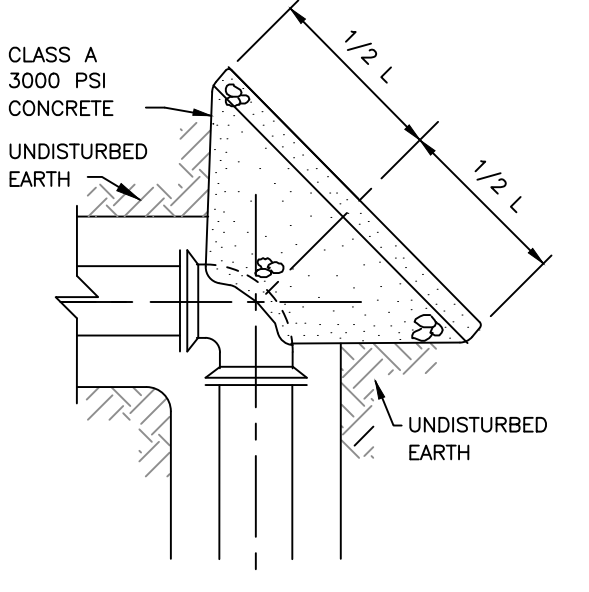
PIPE SIZE INCHES	90 (TEE)				45°				22 1/2°				11 1/4°			
	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
2"	.75'	1.5'	.50'	1.0'	.50'	.75'	.50'	.50'	.50'	.75'	.50'	.50'	.50'	.75'	.50'	.50'
4"	1.5'	3.0'	1.0'	2.5'	1.0'	1.5'	1.0'	1.5'	1.0'	1.5'	1.0'	1.5'	1.0'	1.5'	1.0'	1.5'
6"	2.0'	4.0'	1.5'	3.5'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'
8"	2.5'	5.0'	2.5'	4.0'	1.5'	3.5'	1.0'	2.5'	1.0'	2.5'	1.0'	2.5'	1.0'	2.5'	1.0'	2.5'
10"	3.0'	6.5'	2.5'	5.0'	2.0'	4.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'	1.0'	3.0'
12"	3.5'	8.0'	3.0'	5.0'	2.5'	5.0'	1.5'	3.5'	1.5'	3.5'	1.5'	3.5'	1.5'	3.5'	1.5'	3.5'

CONCRETE THRUST BLOCK SCHEDULE

* FOR DESIGN PRESSURE=200 PSI



PLAN - TEE

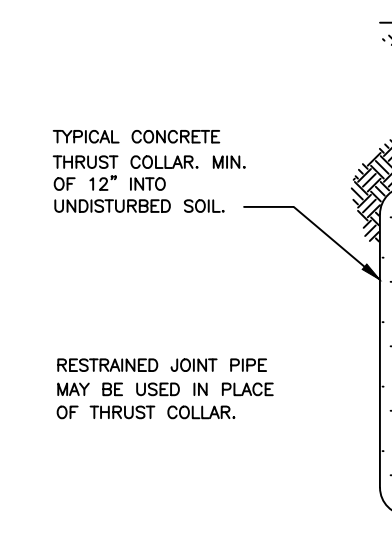
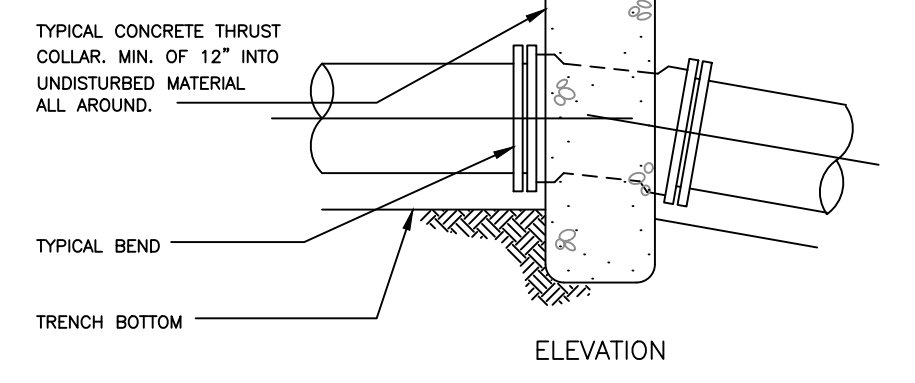


PLAN - BEND

CONCRETE BLOCKING DETAIL

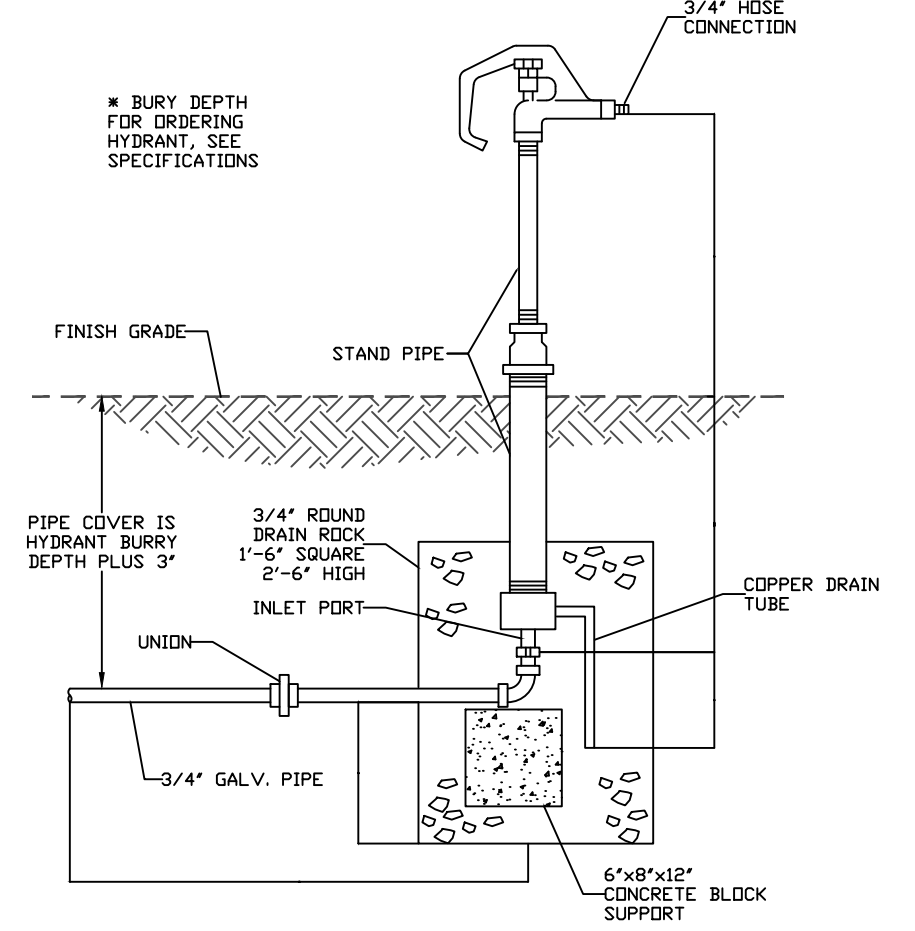
NO SCALE

NOTE: FOR VERTICAL BEND (DOWN) IN EXCESS OF 11 1/4° ANCHORAGE SHALL BE AS DESIGNED BY AN ENGINEER.



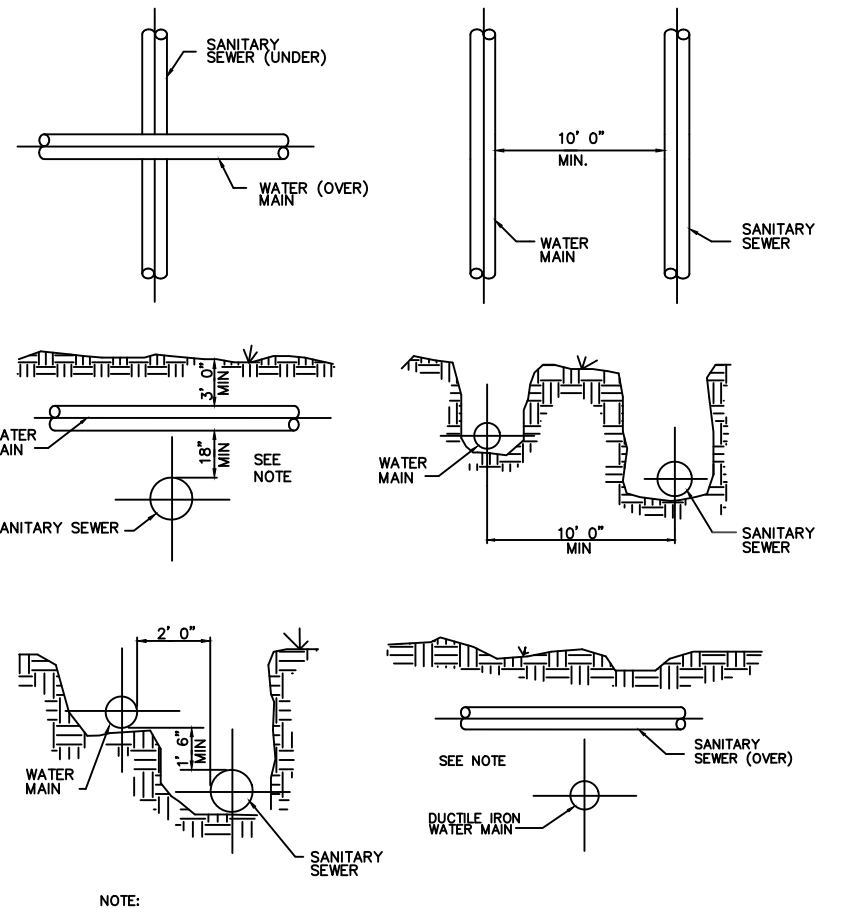
THRUST COLLAR DETAIL

NO SCALE



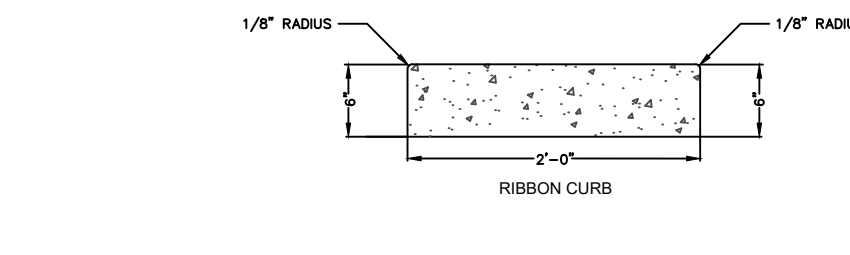
FROST-PROOF HYDRANT

NO SCALE



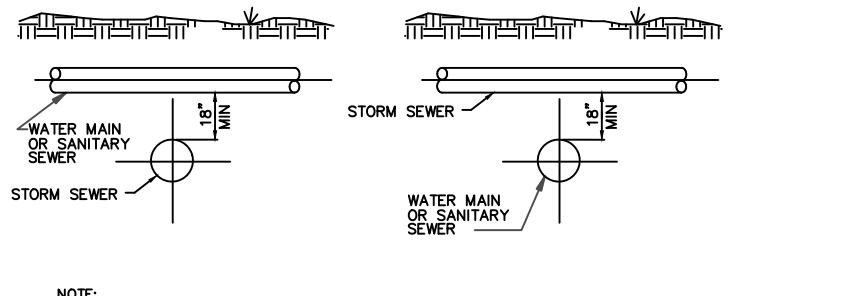
RELATION OF WATER MAINS TO SANITARY SEWER MAINS

NO SCALE



CURB DETAIL

NO SCALE



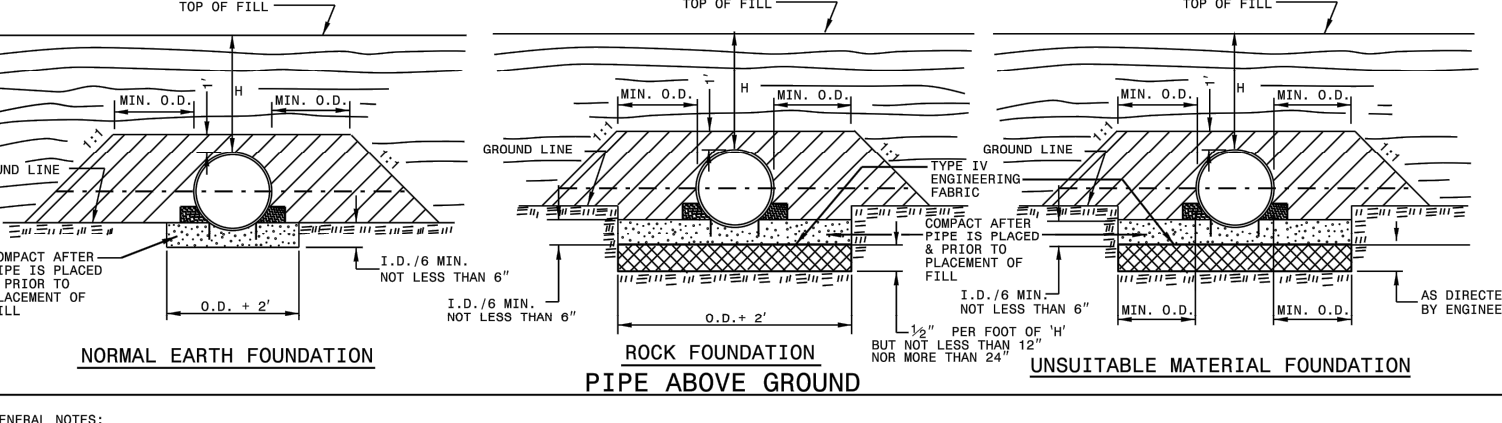
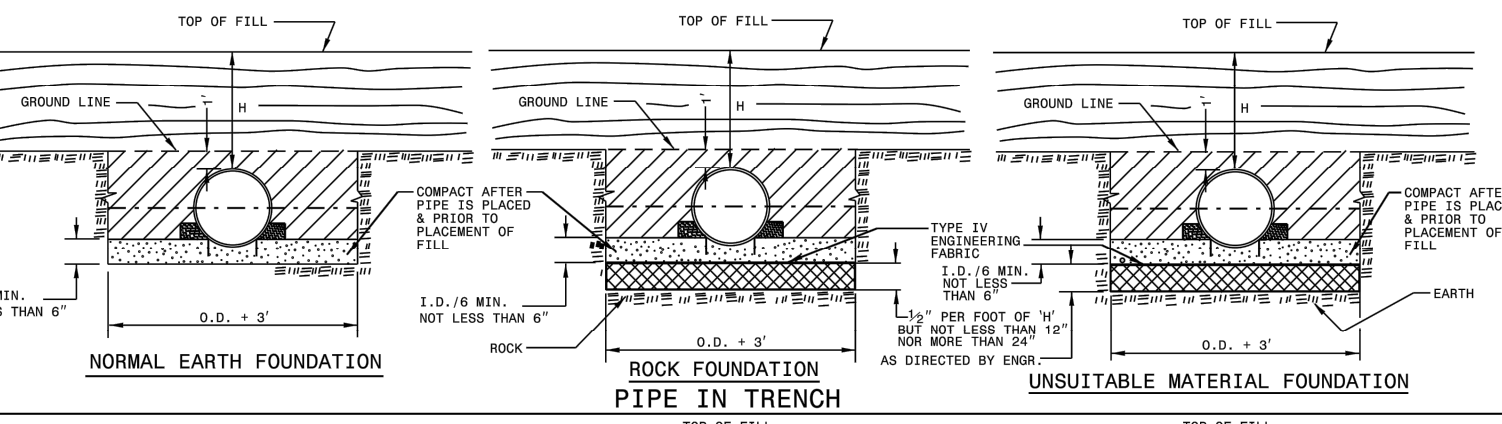
RELATION OF WATER MAINS AND SANITARY SEWERS TO STORM SEWERS

NO SCALE

UTILITY CLEARANCE DETAIL

NO SCALE

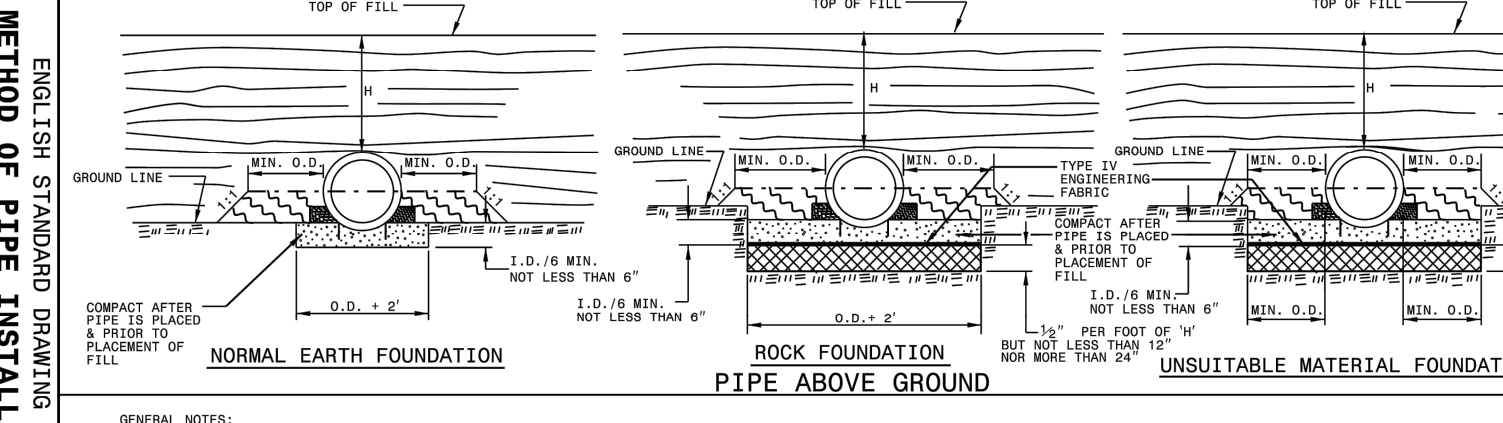
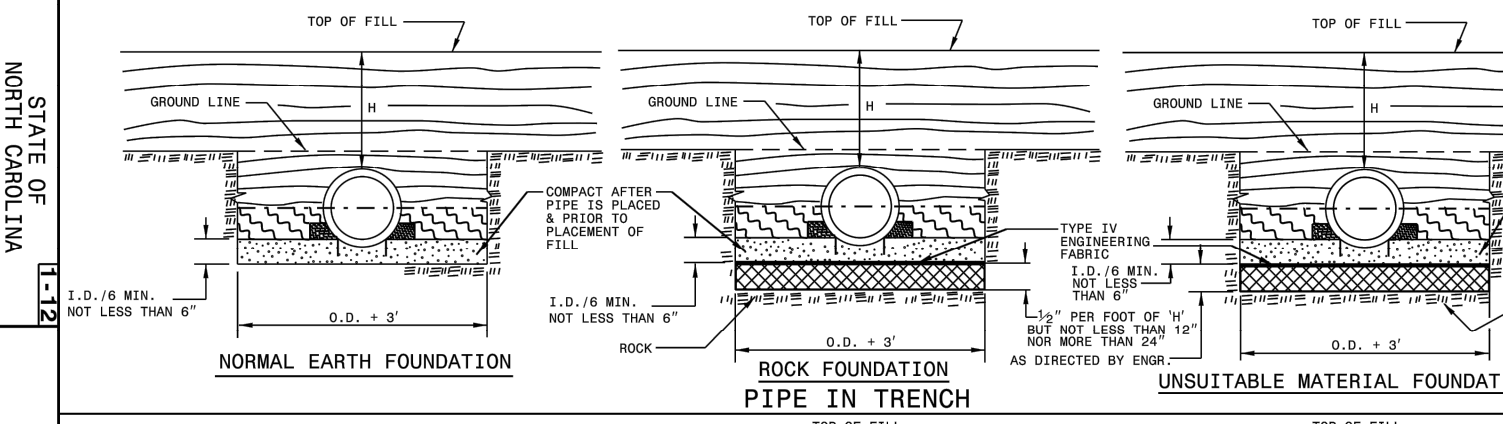
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.



GENERAL NOTES:
 I.O.D. - THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. - THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H - THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II; TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTON.

SHEET 1 OF 3 300.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.



GENERAL NOTES:
 I.O.D. - THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
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SHEET 1 OF 3 300.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

Diameter (Inches)	Minimum cover (Inches)	Maximum Height of Cover (feet)				
		18"	24"	30"	36"	42"
12	12	204	256	308	360	412
15	12	162	204	246	288	330
18	12	135	169	204	246	288
21	12	115	145	180	216	252
24	12	100	126	156	186	216
30	12	79	100	126	156	186
36	12	65	88	117	152	186
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12	44	57	77	100	123
60	12	40	52	69	90	111
66	12	37	48	63	81	100
72	12	34	45	59	74	91
78	12	32	43	56	71	87
84	12	30	41	54	68	83

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS:
 HOPE - (Minimum fill) 2' for pipe diameters ≤ 12" and ≤ 60"
 (Maximum fill) 20' for pipe diameters ≥ 24" and ≤ 60"
 17' for pipe diameters ≥ 30" and ≤ 36"
 PVC - (Minimum fill) 2' for pipe diameters ≤ 12" and ≤ 36"
 (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"
 RCP - (Minimum fill) 1' for Class IV & Class V
 2' for Class III & Class II
 (Maximum fill) 10' - Class II pipe
 20' - Class III pipe
 30' - Class IV pipe
 40' - Class V pipe
 (For fills > 40' & < 80' use LRFD Direct Design Method)

SHEET 3 OF 3 300.01

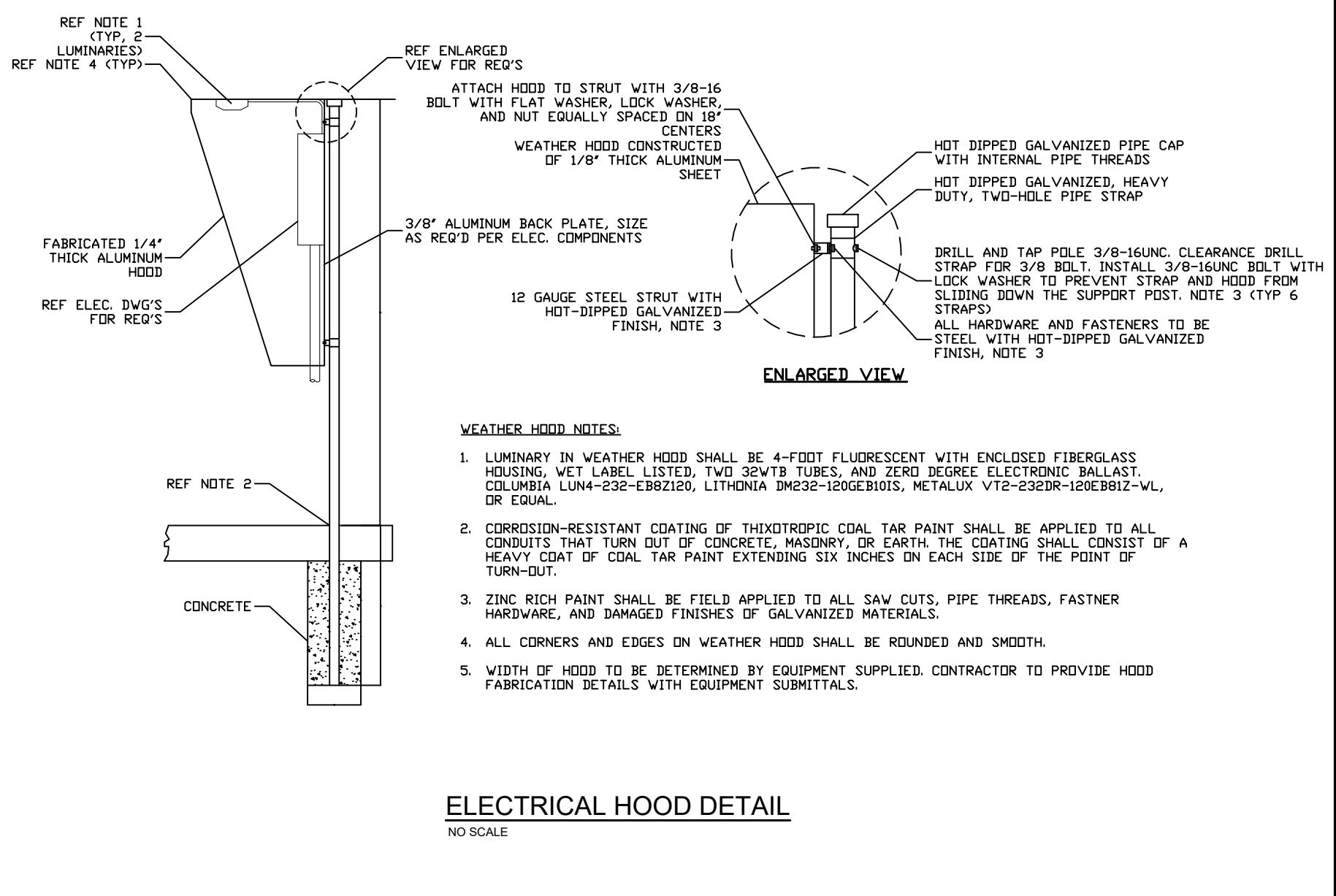
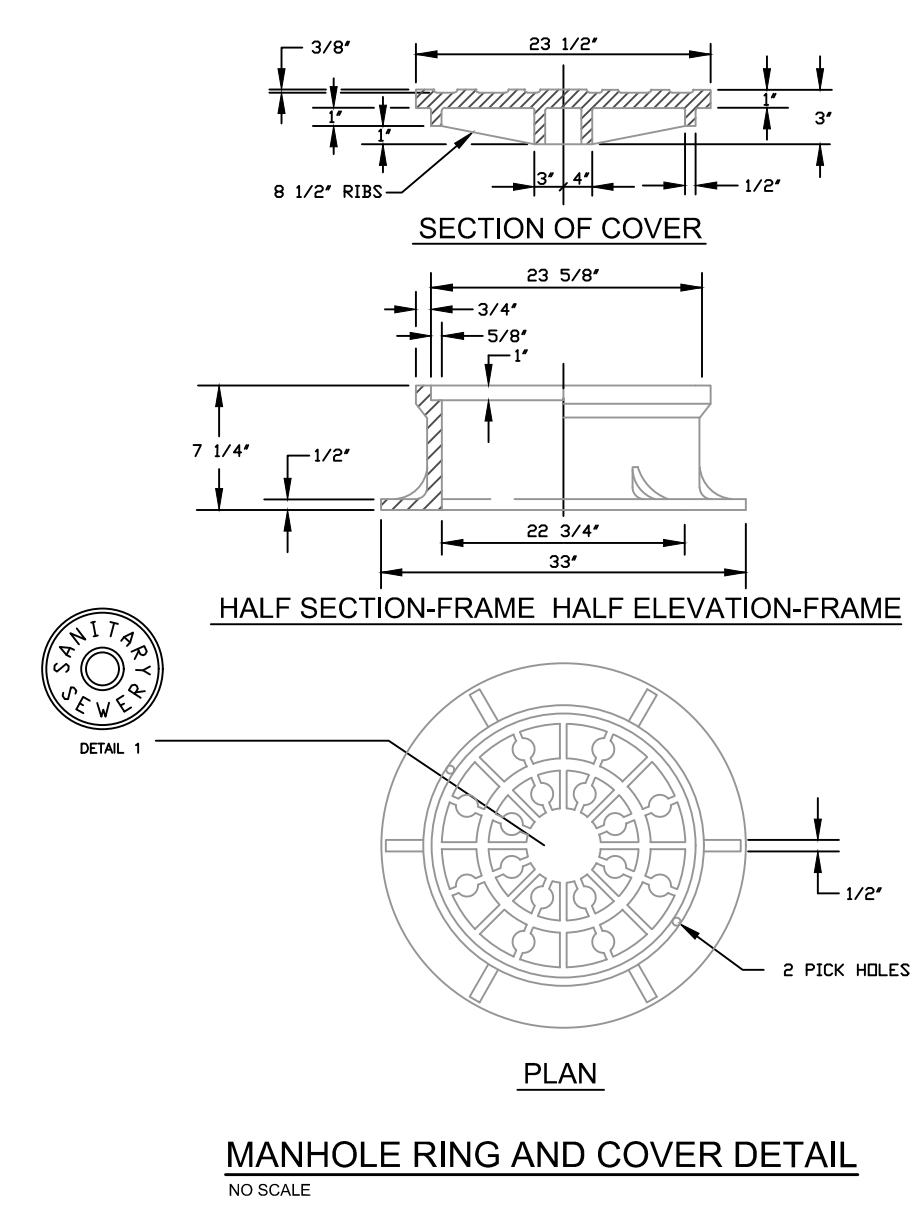
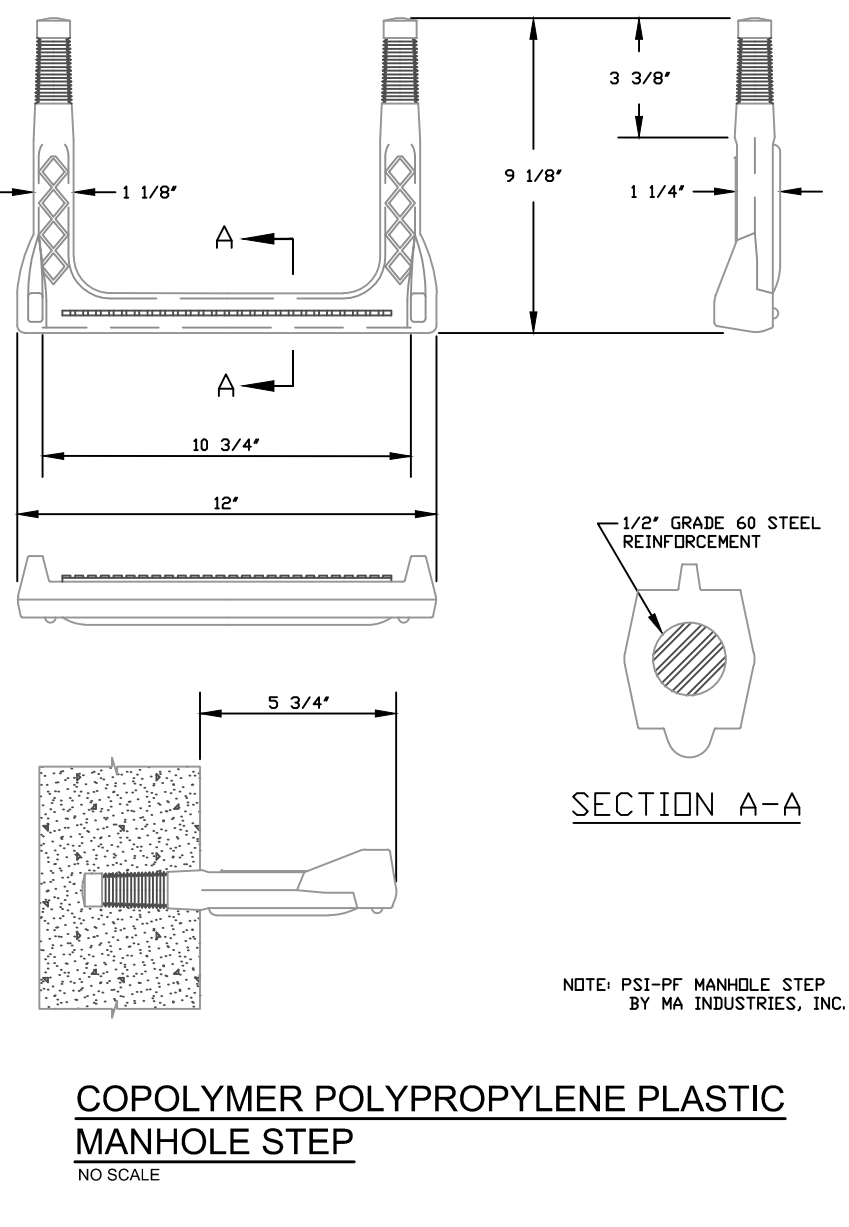
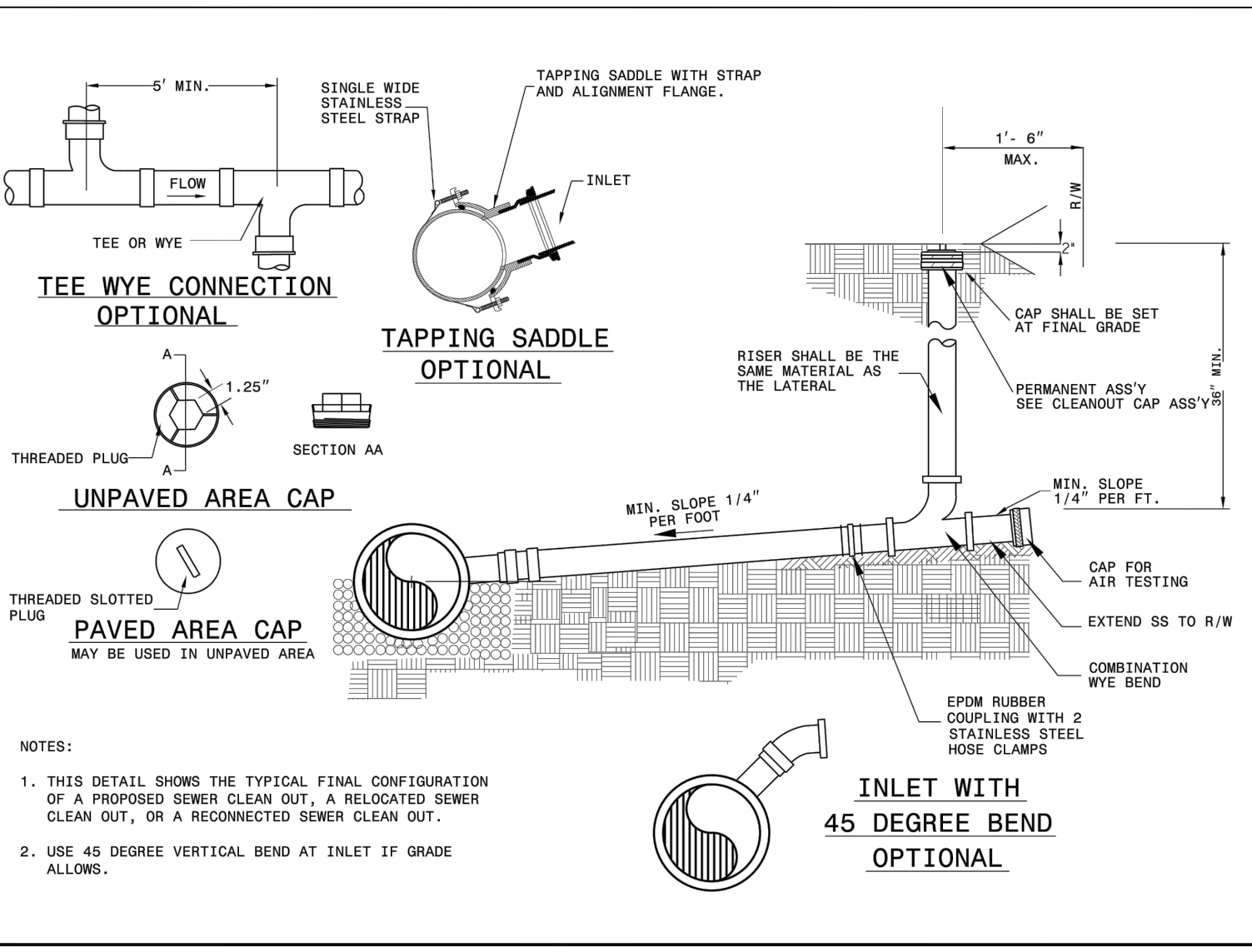
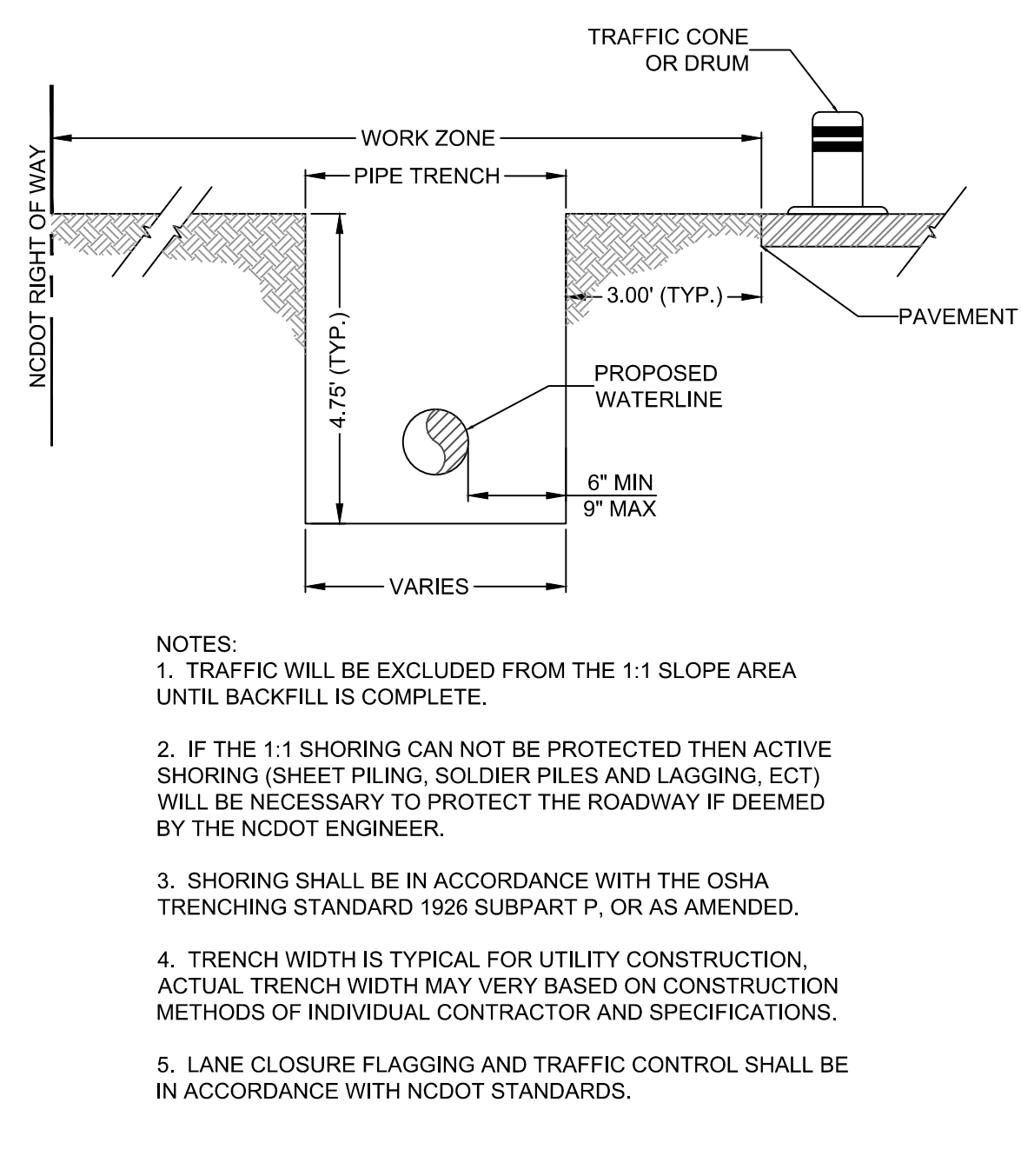
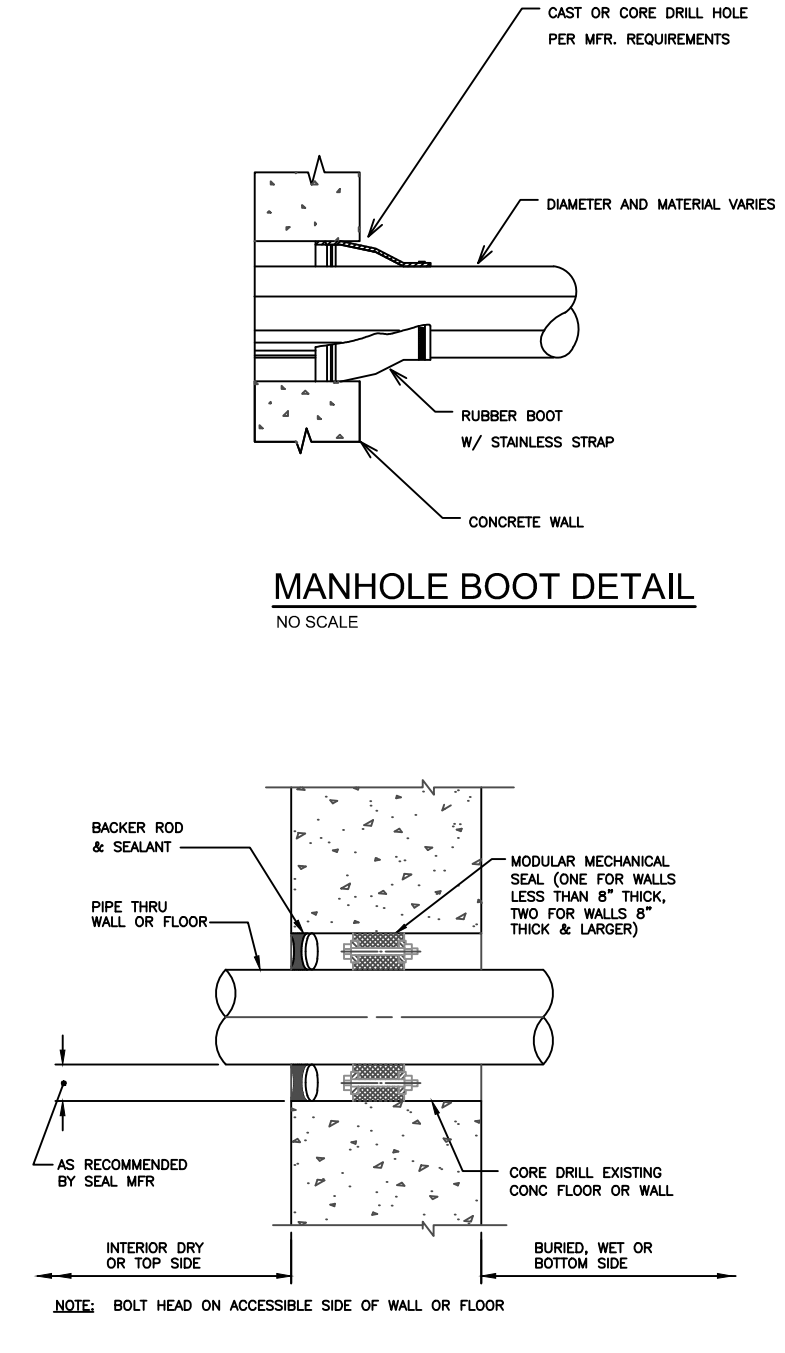
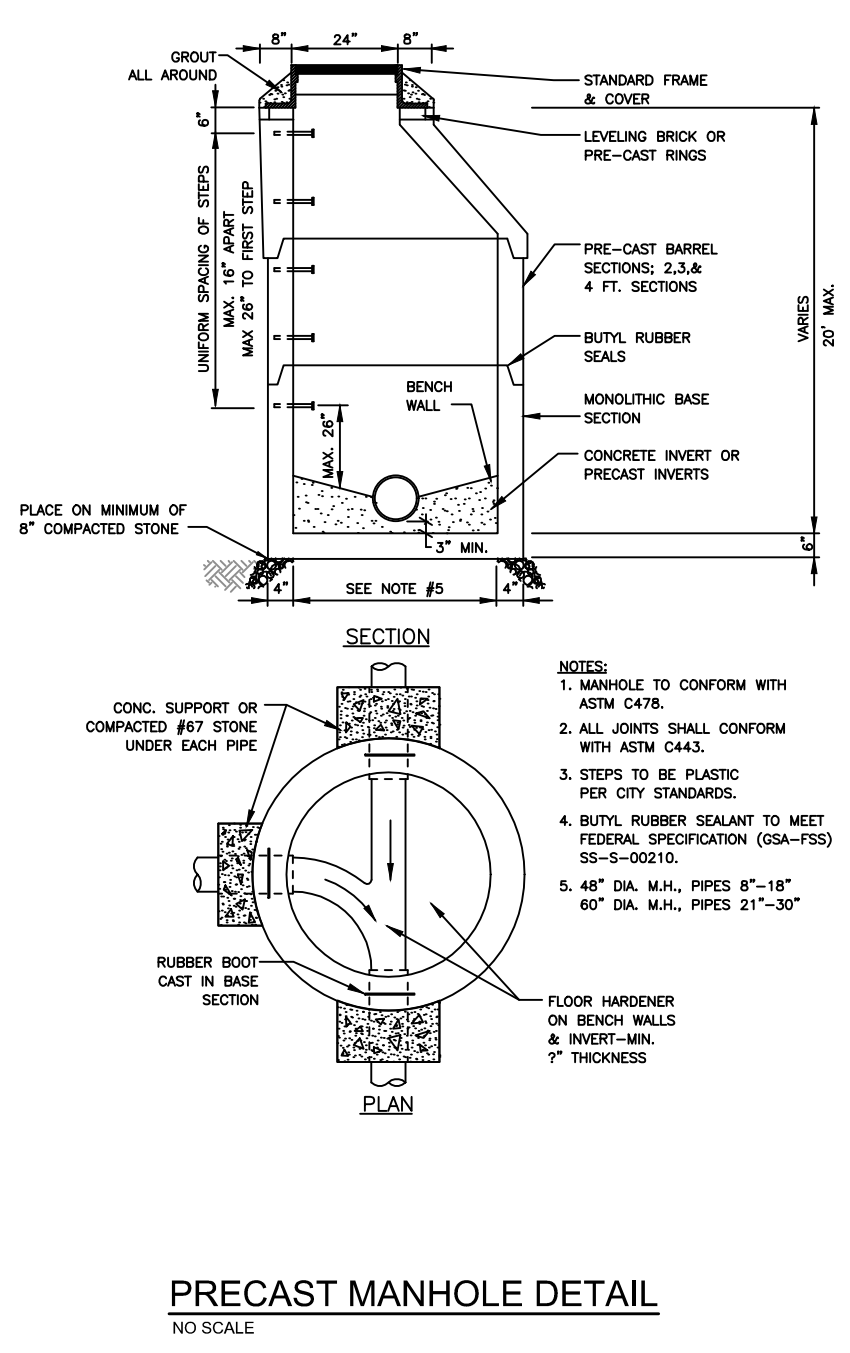
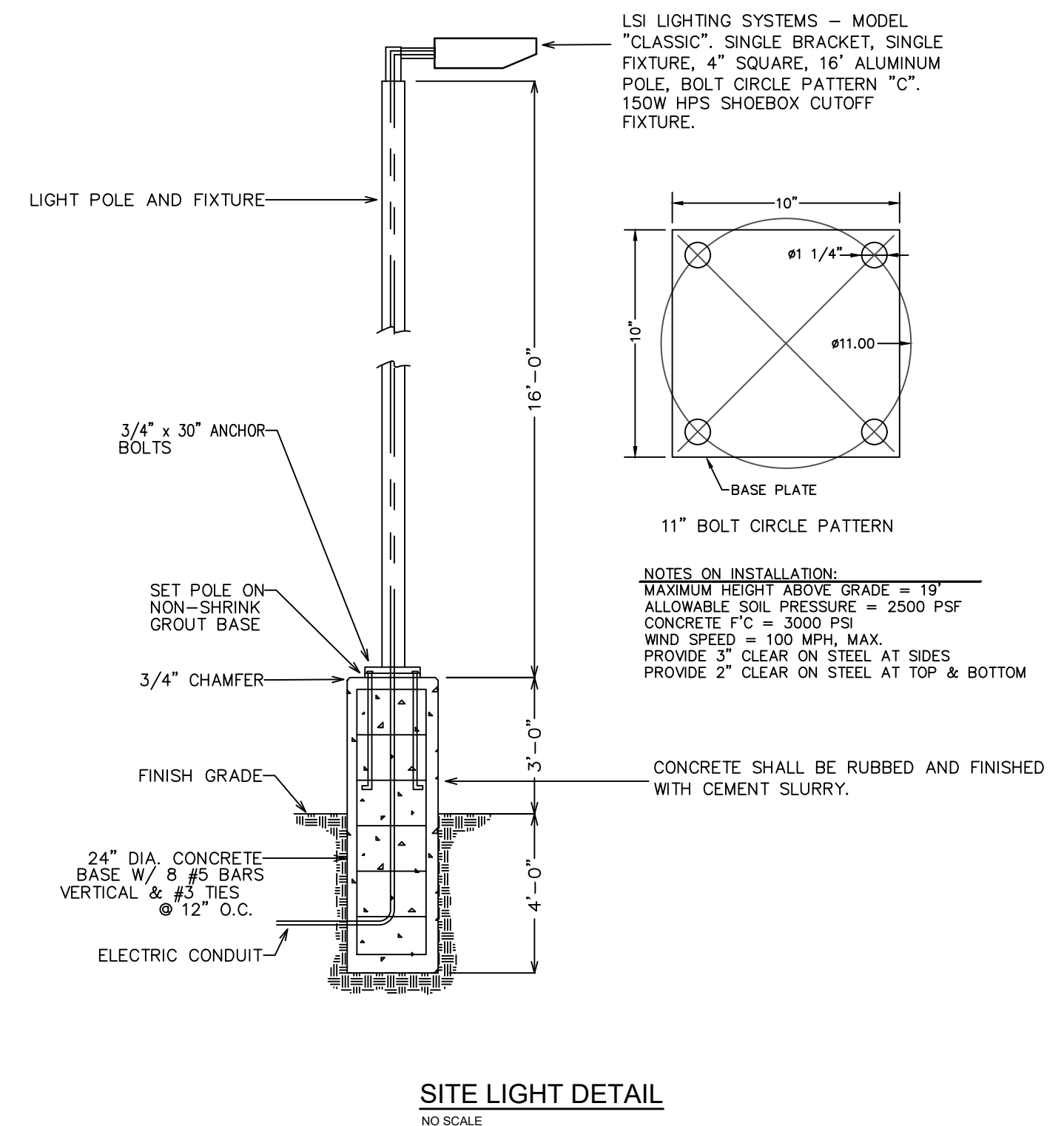
PROJECT REFERENCE NO.	SHEET NO.
R-2530B	UC-3D
DESIGNED BY: RCC	
DRAWN BY: RCC	
CHECKED BY: SGC	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

chambers
engineering, pa

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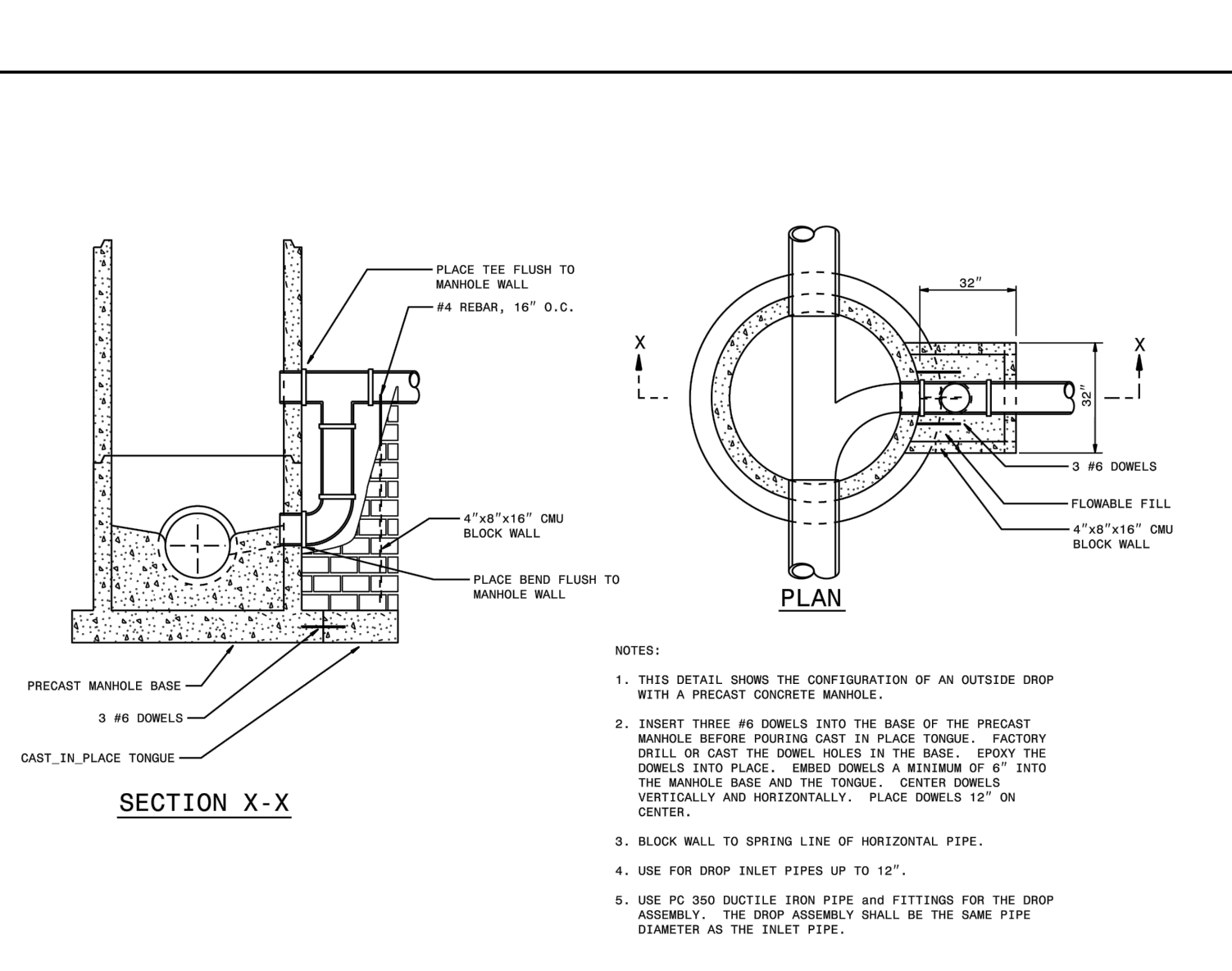
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DESIGNED BY:	RCC		
DRAWN BY:	RCC		
CHECKED BY:	SGC		
APPROVED BY:			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
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UTILITY CONSTRUCTION



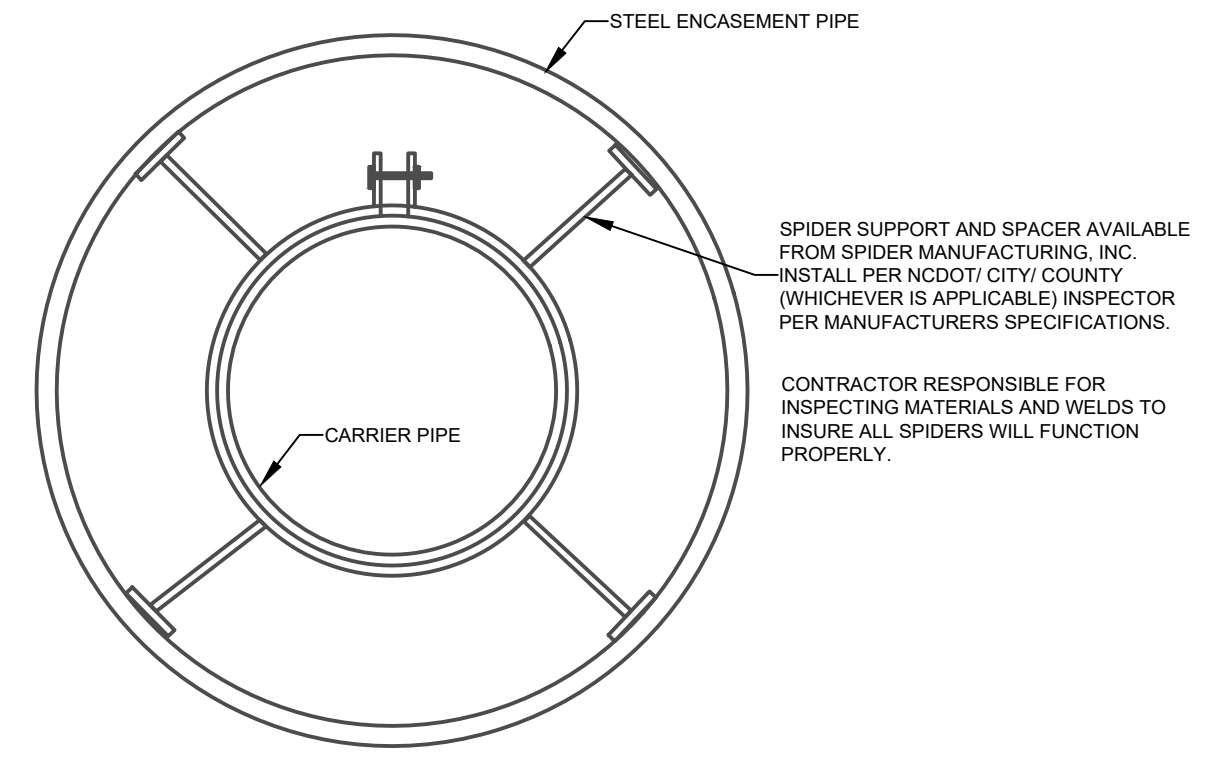
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- NOTES:
1. THIS DETAIL SHOWS THE CONFIGURATION OF AN OUTSIDE DROP WITH A PRECAST CONCRETE MANHOLE.
 2. INSERT THREE #6 DOWELS INTO THE BASE OF THE PRECAST MANHOLE BEFORE POURING CAST IN PLACE TONGUE. FACTORY DRILL OR DART THE DOWEL HOLES IN THE BASE. EMPTY THE DOWELS INTO PLACE. EMBED DOWELS A MINIMUM OF 8" INTO THE MANHOLE BASE AND THE TONGUE. CENTER DOWELS VERTICALLY AND HORIZONTALLY. PLACE DOWELS 12" ON CENTER.
 3. BLOCK WALL TO SPRING LINE OF HORIZONTAL PIPE.
 4. USE FOR DROP INLET PIPES UP TO 12".
 5. USE PG 350 DUCTILE IRON PIPE AND FITTINGS FOR THE DROP ASSEMBLY. THE DROP ASSEMBLY SHALL BE THE SAME PIPE DIAMETER AS THE INLET PIPE.

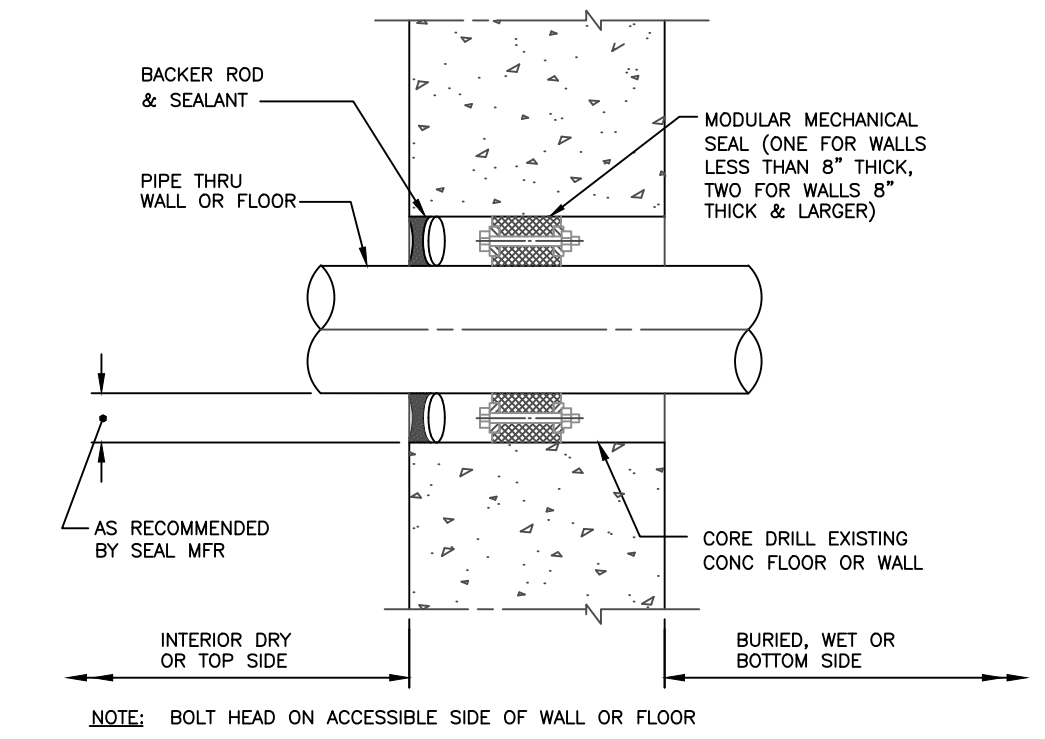
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR PRECAST CONCRETE SANITARY SEWER MANHOLE - OUTSIDE DROP
SHEET 1 OF 1
1525.02



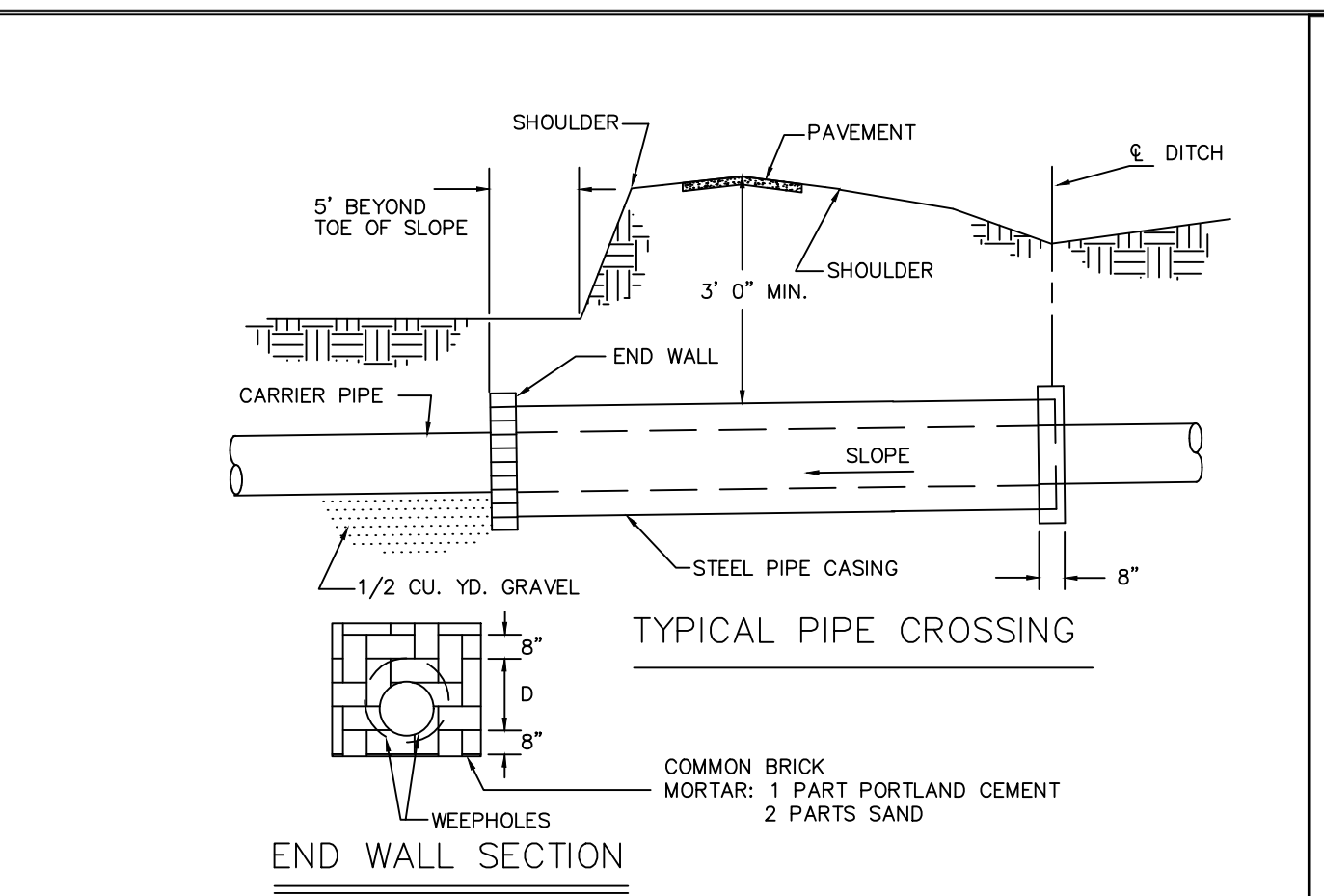
- NOTES:
1. NO PIPE SHALL BE SUPPORTED BY BELL.
 2. END SECTIONS LESS THAN 4' MAY BE UNSUPPORTED.
 3. WALL THICKNESS AS PER TABLE UNLESS OTHERWISE SHOWN ON PLAN.
 4. MASONRY SEAL AT ENDS - 2" x 4" WEEP HOLE AT LOW END.
 5. ALL PRESSURE PIPES TO HAVE TRACING WIRE IN ALL CASING BORES.

CARRIER PIPE	CASING PIPE I.D.	WALL THICKNESS
4"	8"	0.188"
6"	12"	0.188"
8"	16"	0.250"
10"	20"	0.281"
12"	24"	0.344"

PIPE ENCASUREMENT
N.T.S.

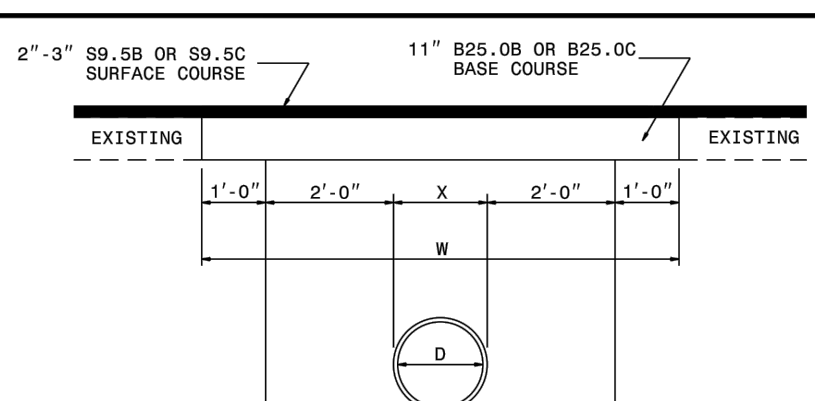


ANNULAR SEAL WALL PENETRATION
N.T.S.



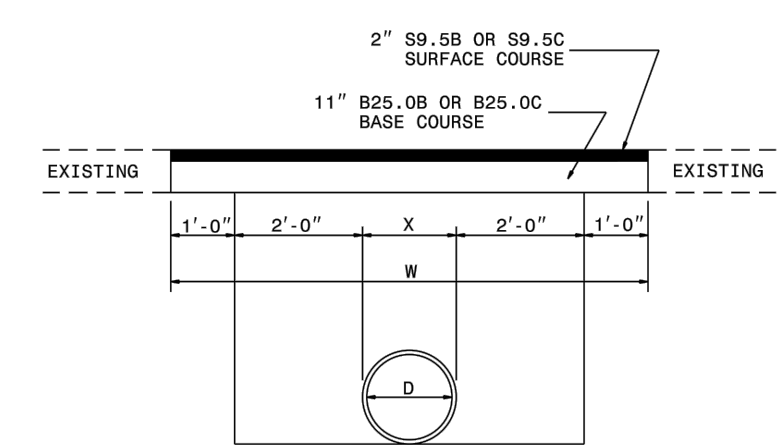
- NOTES:
1. SEE DRAWINGS FOR LOCATION, SIZE AND LENGTH OF STEEL PIPE CASINGS.
 2. INSTALL DRAINS EACH SIDE OF CARRIER PIPE IN DOWNHILL END WALL.

BORE & JACK DETAIL
N.T.S.



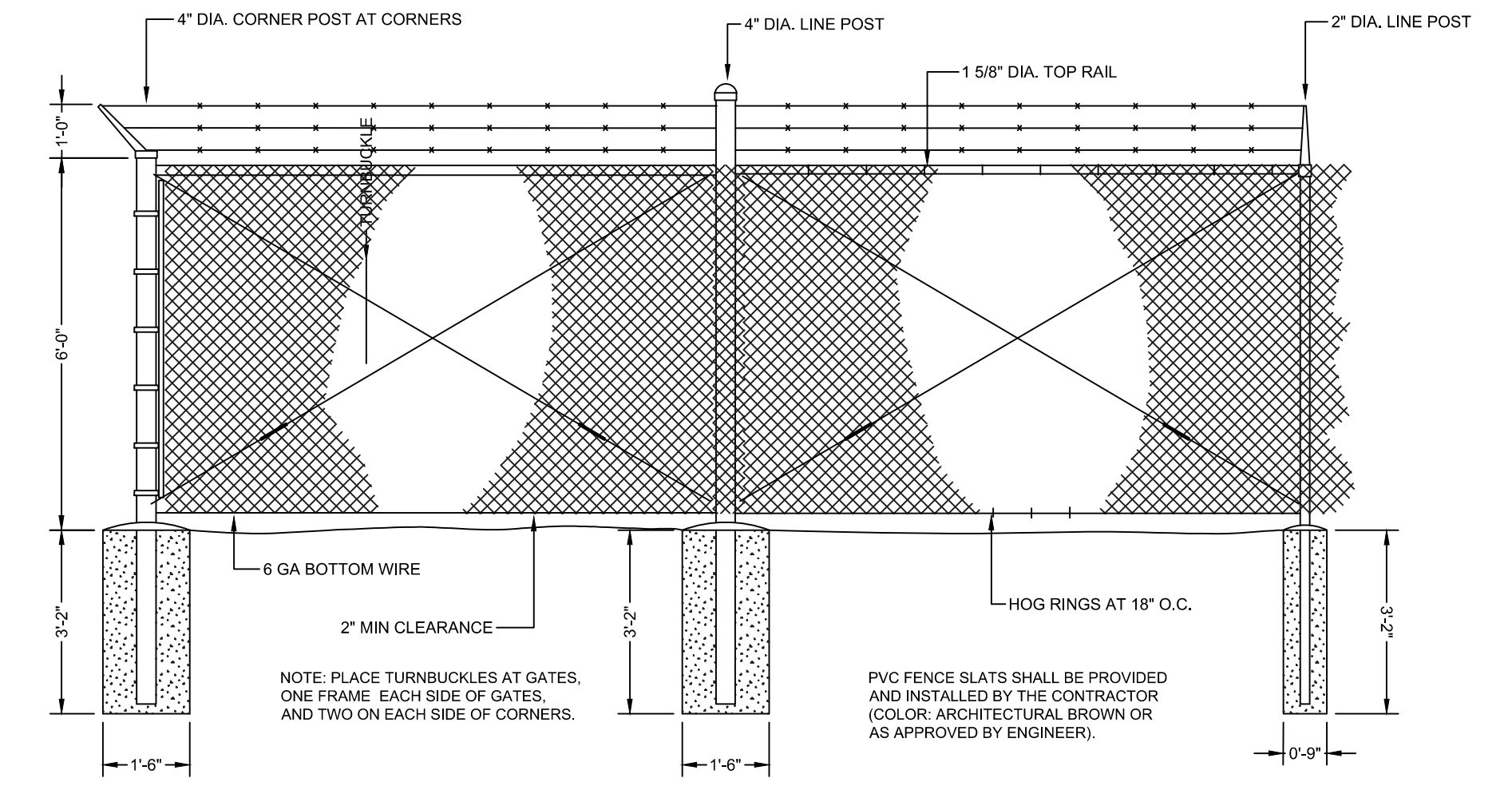
PAVEMENT REPAIRS ON ROADS TO BE RESURFACED
(PIPE IS PLACED UNDER EXISTING PAVEMENT)

D	X	W
12"	1'-4"	7'-4"
15"	1'-7"	7'-7"
18"	1'-10"	7'-10"
24"	2'-6"	8'-6"
30"	3'-1"	9'-1"
36"	3'-8"	9'-8"
42"	4'-5"	10'-5"
48"	5'-0"	11'-0"



PAVEMENT REPAIRS ON ROADS NOT TO BE RESURFACED
(PIPE IS TO BE PLACED UNDER EXISTING PAVEMENT)

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR PAVEMENT REPAIRS FOR SUPERPAVE MIX TYPES
SHEET 1 OF 1
654.01



CHAIN LINK FENCE REQUIREMENTS
NO SCALE

- NOTES:
1. PLACE TURNBUCKLES AT GATES, ONE FRAME EACH SIDE OF GATES, AND TWO ON EACH SIDE OF CORNERS.
 2. FENCE SHALL BE BLACK VINYL COATED.

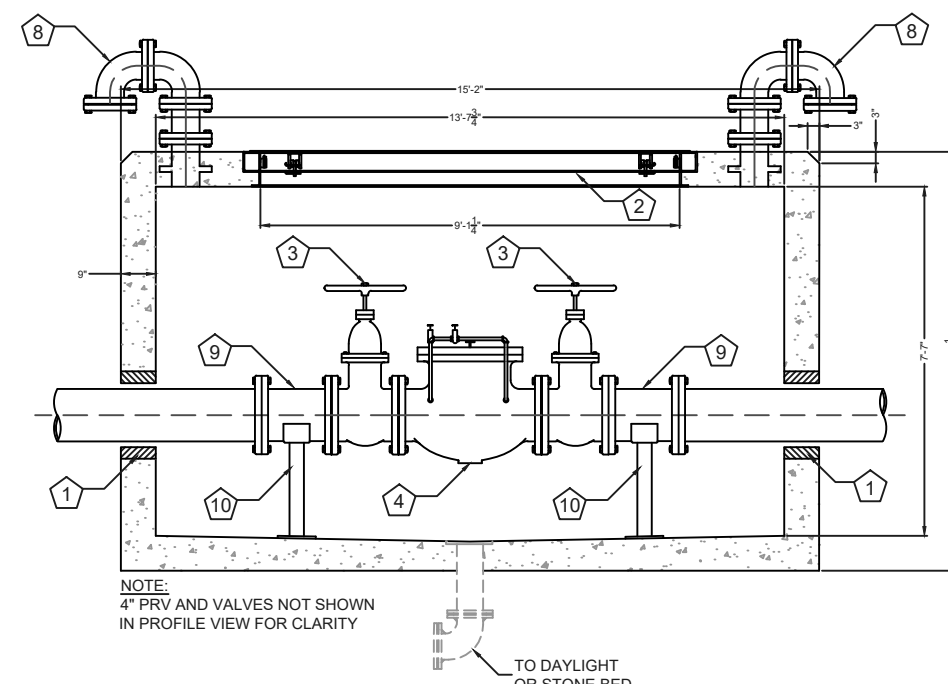
PROJECT REFERENCE NO.	SHEET NO.
R-2530B	UC-3F
DESIGNED BY: RCC	
DRAWN BY: RCC	
CHECKED BY: SGC	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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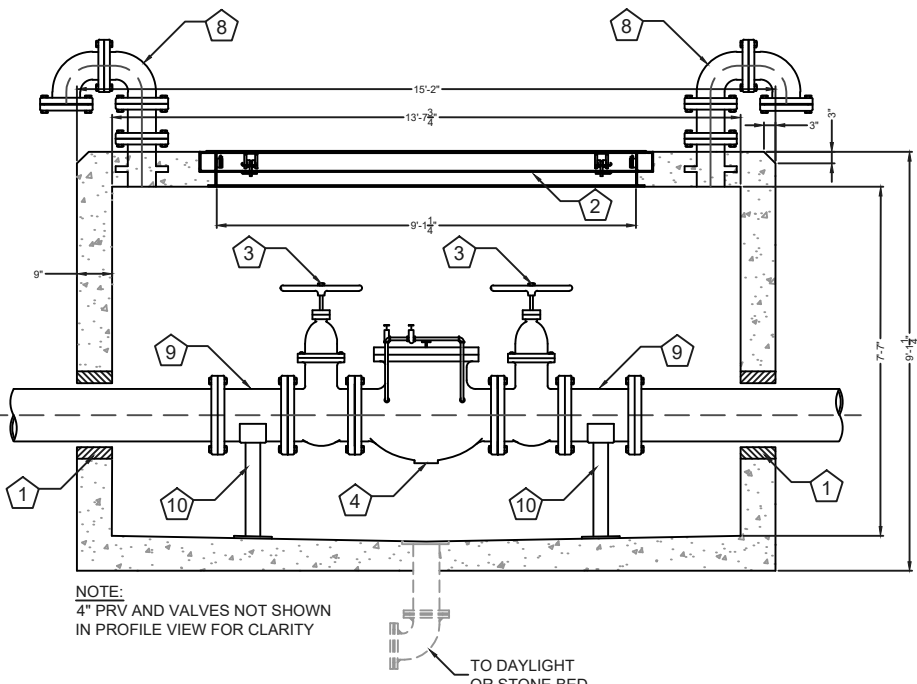


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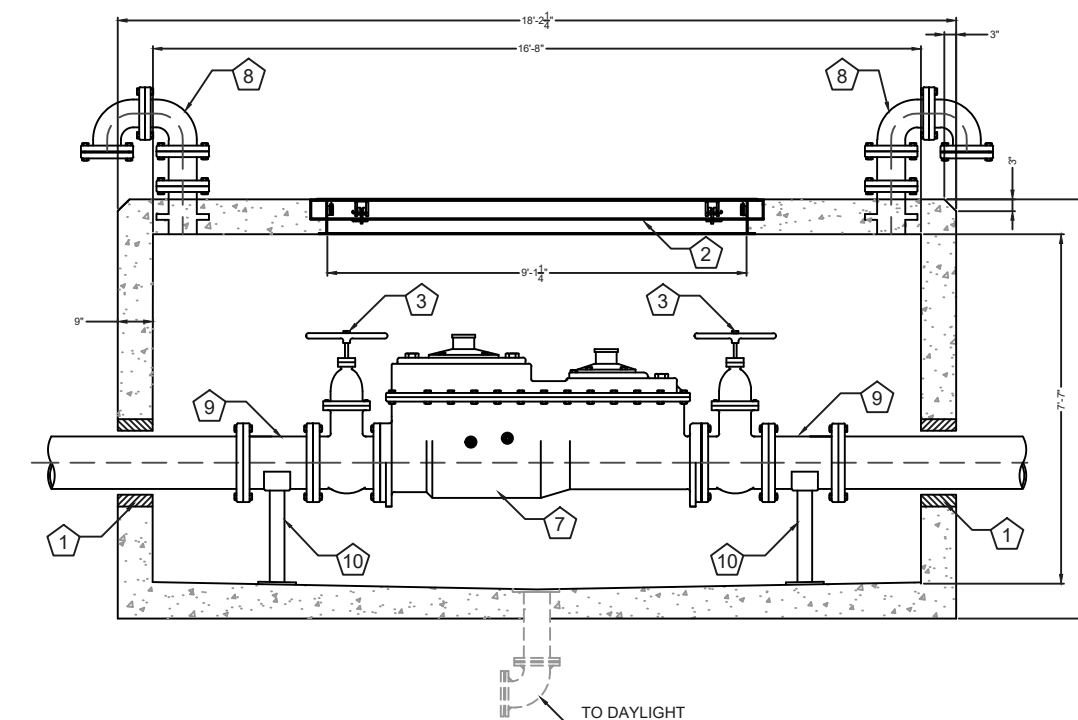
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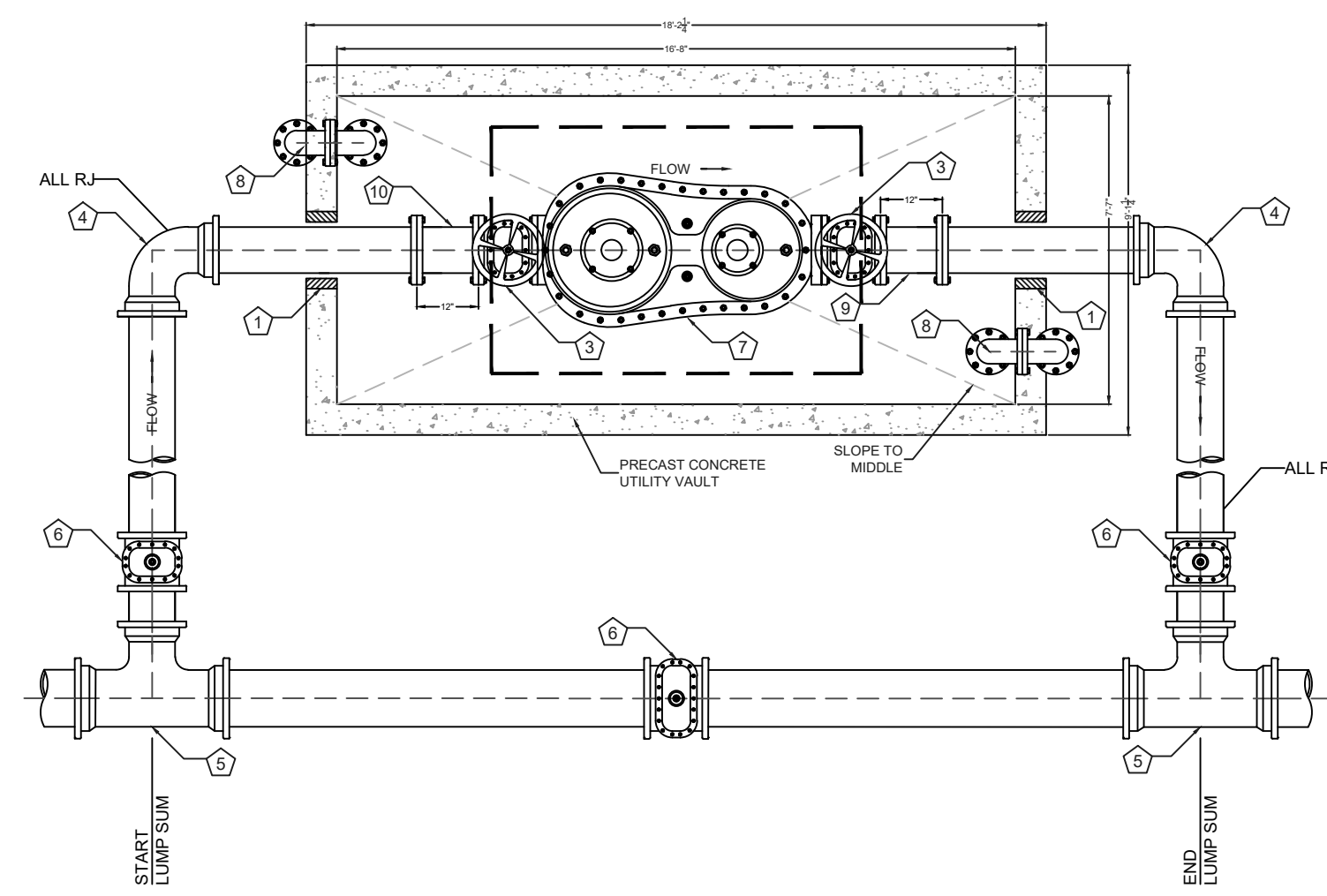
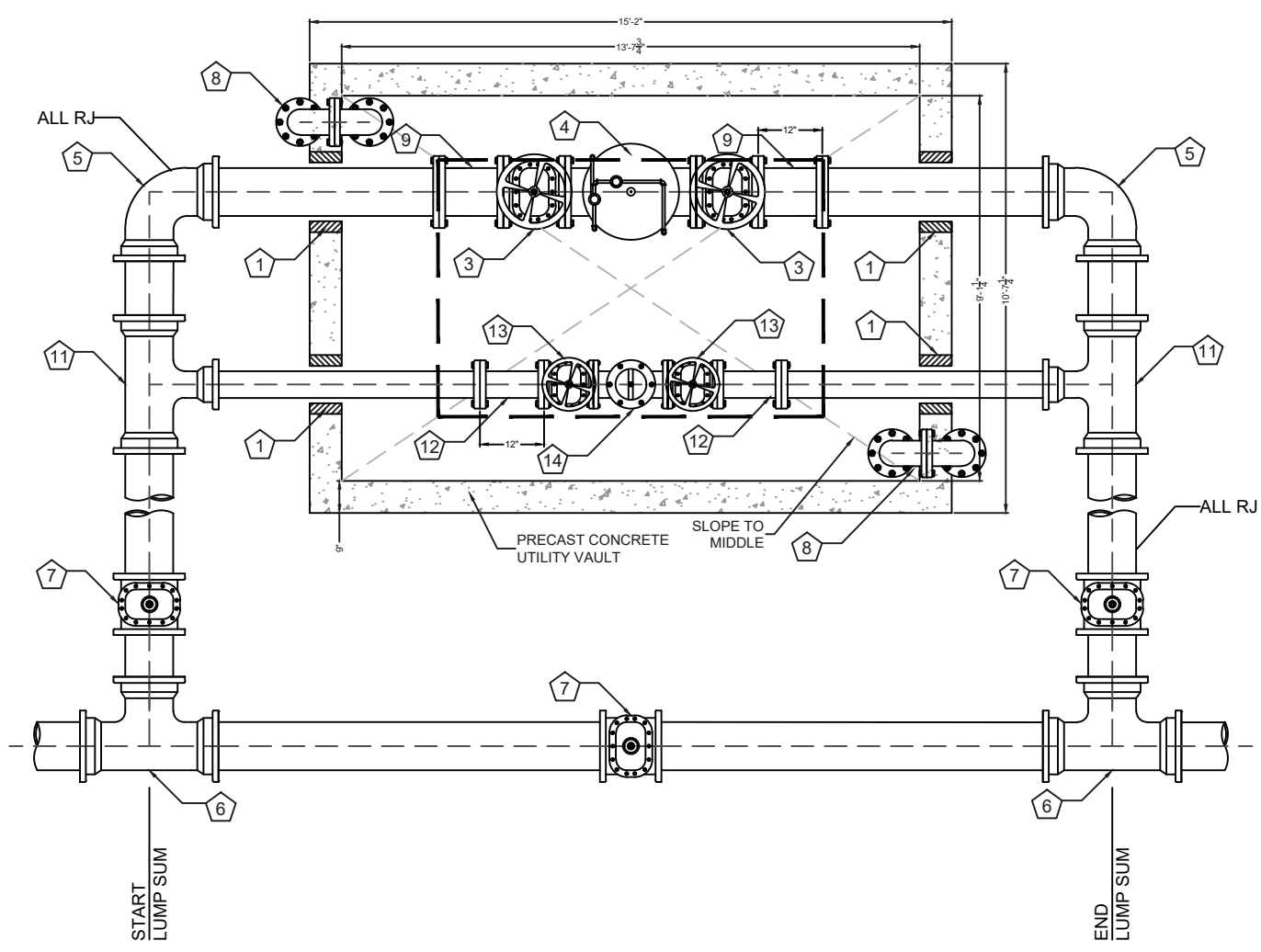
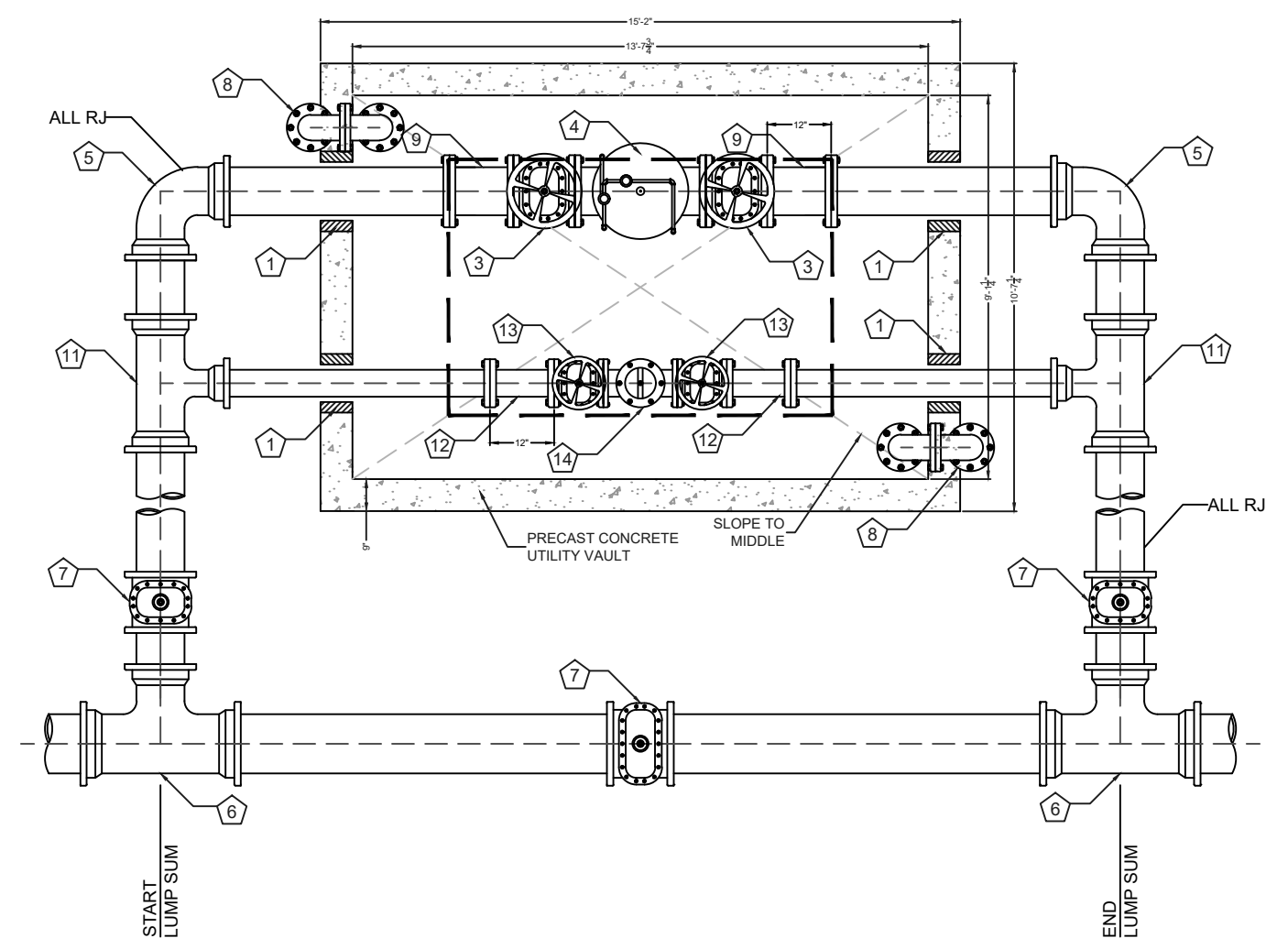
NOTE:
 4" PIPES AND VALVES NOT SHOWN
 IN PROFILE VIEW FOR CLARITY



NOTE:
 4" PIPES AND VALVES NOT SHOWN
 IN PROFILE VIEW FOR CLARITY



TO DAYLIGHT
 OR STONE BED



PRESSURE REDUCING STATION 1 (HWY 24-27)

NO SCALE

PRESSURE REDUCING STATION 2 (INDIAN MOUND RD.)

NO SCALE

MASTER METER VAULT

NO SCALE

1	WALL PENETRATION ANNULAR SEAL
2	ALUMINUM ACCESS HATCH, 48" X 72" CLEAR OPENING, DOUBLE LEAF
3	12" GATE VALVE, FL
4	12" COMBINATION PRESSURE REDUCING / PRESSURE SUSTAINING VALVE
5	12" X 12" 90° DI ELBOW, MJ
6	12" X 12" X 12" DI TEE, MJ
7	12" GATE VALVE, MJ
8	4" X 4" 90° DI ELBOWS, FL X FL, VENT W/ SS SCREEN
9	12" DI SPOOL, 12" LENGTH
10	STEEL PIPE SUPPORT
11	12" X 12" X 4" DI TEE, MJ
12	4" DI SPOOL, 12" LENGTH
13	4" GATE VALVE, FL
14	4" PRESSURE REDUCING VALVE

MAX INLET PRESSURE: 150 PSI
 MIN INLET PRESSURE: 100 PSI
 FLOW RANGE: 50 - 4,000 GPM
 OUTLET SET POINT: 45 - 75 PSI

1	WALL PENETRATION ANNULAR SEAL
2	ALUMINUM ACCESS HATCH, 48" X 72" CLEAR OPENING, DOUBLE LEAF
3	8" GATE VALVE, FL
4	8" COMBINATION PRESSURE REDUCING / PRESSURE SUSTAINING VALVE
5	8" X 8" 90° DI ELBOW, MJ
6	8" X 8" X 8" DI TEE, MJ
7	8" GATE VALVE, MJ
8	4" X 4" 90° DI ELBOWS, FL X FL, VENT W/ SS SCREEN
9	8" DI SPOOL, 12" LENGTH
10	STEEL PIPE SUPPORT
11	8" X 8" X 4" DI TEE, MJ
12	4" DI SPOOL, 12" LENGTH
13	4" GATE VALVE, FL
14	4" PRESSURE REDUCING VALVE

MAX INLET PRESSURE: 150 PSI
 MIN INLET PRESSURE: 100 PSI
 FLOW RANGE: 50 - 4,000 GPM
 OUTLET SET POINT: 45 - 75 PSI

1	WALL PENETRATION ANNULAR SEAL
2	ALUMINUM ACCESS HATCH, 48" X 72" CLEAR OPENING, DOUBLE LEAF
3	12" GATE VALVE, FL
4	12" X 12" 90° DI ELBOW, MJ
5	12" X 12" X 12" DI TEE, MJ
6	12" GATE VALVE, MJ
7	12" COMPOUND MAGNETIC DRIVE METER
8	4" X 4" 90° DI ELBOWS, FL X FL, VENT W/ SS SCREEN
9	12" DI SPOOL, 12" LENGTH
10	STEEL PIPE SUPPORT

ACCEPTABLE MANUFACTURERS: HERSEY, KENT, BADGER, AND NEPTUNE