SANITARY SEWER STANDARD DETAILS

LEGEND

MetroConnects
Sustainable Wastewater Solutions

Metropolitan Sewer Subdistrict
1151 W Butler Rd.
Greenville, South Carolina
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APPROVED MATERIALS

Approved Materials				
Item	**Type**	**Manufacturer**	**Standards**	**Notes**
Manholes				
Precast Concrete Manholes		Tindall, Knight's, Upstate	ASTM C478 or ASTM C913	4,000 psi, Min wall 5"
Joint Sealer	Type B Butyl Rubber	Conseal		
Joint Wrap	Type B Butyl Rubber	Conseal		1/16" thick, 6" wide
Flexible Manhole Boot	Kor-N Seal or PSX: Direct Drive	Trelleborg or Press-Seal Corp.	ASTM C923	
Manhole Steps	Copolymer Polypropylene Plastic			1/2" dia grade 60 steel bar
Manhole Ring and Cover	668 Ring and YF Cover or V1384 Ring and Cover	US Foundaries or EJ	ASTM A48, AASHTO M105 and AASHTO M306	Metro Logo
Watertight Ring and Cover	668 Ring and YF Cover or V1384 w/ camlocks and TSG Gaskets	US Foundaries or EJ	ASTM A48, AASHTO M105 and AASHTO M306	Metro Logo, Flat top manholes to use USF 1261 YF BWT
Inside Bowl Drop	Reliner	Reliner / Duran Inc.		
Valve Box and Cover (Cast Iron)	USF 7631, EJ 1566	US Foundaries or EJ		Metro Cover
Wetwell/Manhole Coating	Raven 405, Dura-Plate 6100	Raven Lining Systems, Sherwin Williams		ARMOROCK polymer manholes may be used instead of lining manhole
Ductile Iron Pipe (DIP)	**ALL DIP PIPE AND FITTINGS TO HAVE TNEMEC 431 INTERIOR COATING**			
Ductile Iron Pipe	Thickness Class 50 or Pressure Class 350	McWane, US Pipe, or American	ASTM A746, ANSI A21.50 AND ANSI/AWWA C151/A21.51	Tnemec 431 Interior Coating
Push on Joints	Tyton Joint Pipe	McWane, US Pipe, or American	ANSI/AWWA C111/A21.11	
Gaskets for Mechanical and Push On	Red Rubber (SBR)		ANSI A21.11	
Flanged Pipe	Thickness Class 53	McWane, US Pipe, or American	ANSI B 16.1	Tnemec 431 Interior Coating, working pressure 150 psi
Gaskets for Flanged Pipe	Neoprene, SBR, Buna-N Nirtrile or EPDM		ANSI/AWWA C111/A21.11	
Restrained Joints	TR Flex, BOLT-LOK	McWane, US Pipe, or American	ANSI/AWWA C111/A21.11	
Joint Restraint Gaskets	Sure Shop 350, Field-Lok 350	McWane, US Pipe, or American	ANSI A21.11	
Fittings	DIP		ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53	Tnemec 431 Interior Coating
Exterior Coatings (for buried pipe)	asphaltic		ANSI/AWWA C151/A21.51	
Exterior Coatings (for above grade pipe)		Sherwin-Williams or TNEMEC		Refer to Tech Specs Sect 04301 subsection 3.6
Expansion Joints	Ex-Tend 200	EBAA Iron Sales		
Bell Restraint Harness	MEGALUG Series 1700	EBAA Iron Sales		Minimum working pressure of 200 psi
Mechanical Restraint	MEGALUG Series 1700	EBAA Iron Sales		
PVC Pipe				
PVC Pipe	SDR 26	JM Eagle, Diamond Plastics, National, Vulcan, West Lake, or Sanderson	ASTM 3034 (6" - 15"), ASTM F679 (18" - 27")	
C-900	DR-18	JM Eagle, Diamond Plastics, National, Vulcan, West Lake, or Sanderson	AWWA C900	
Fittings	SDR 26		ASTM F-1336	
Bell Restraint Harness (C 900)	Series 1600	EBAA Iron Sales		
Gaskets			ASTM F-477	
Mechanical Restraint	2000 PV	EBAA Iron Sales		

Materials that are considered "Metro Approved Equals" must be reviewed and accepted by MetroConnects.

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Revision Date: January 28, 2026

APPROVED MATERIALS

Approved Materials

Pump Station	Manufacturer	Model Number	Notes
Air Release Valve	ARI	D-025	
Plug Valve	DeZURICK or Milliken		100% Port Eccentric
Swing Check Valve	DeZURIK, GA Industries, or Milliken		APCO CVS-6000 Series Swing Check Valve, Figure 340 Series Swing Check Valve, or Series 8001 Swing Check Valve
Epoxy Coating	Sherwin Williams or RAVEN	Duraplate 6100 or RAVEN 405	Wet well, Receiving MH, Doghouse MH, ARV MH
Pumps	SULZER / ABS		
SCADA	HighTide		Installed outside of panel box
Pump Control	Pulsar	Zenith	Install with radar or ultrasonic transducer level sensor
Gauge/Diaphragm	Ashcroft	No.50-101SS-04T-CG	Or Equivalent. Must read in psi and ft of head
Flow Meter	Toshiba	LF654	
Generator	Caterpillar or Cummins		
Access Hatch	Halliday	Safe Hatch	Must include: orange safety grate, hasp-equipped padlock clip
Tracer Wire			12 Gauge Solid Copper Wire PVC Coated (Green)

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1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES BY CONTACTING SC 811 A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.

2. THE CONTRACTOR SHALL CONTACT METRO SEWER INSPECTORS, AT INSPECTORS@METROCONNECTS.ORG, A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION TO SCHEDULE A PRE-CONSTRUCTION MEETING.

3. THE CONTRACTOR SHALL SUPPLY METRO WITH A CURRENT CONSTRUCTION SCHEDULE PRIOR TO CONSTRUCTION.

4. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING ALL WORK IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).

5. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS AND SPECIFICATIONS OF METRO AND ALL OTHER APPLICABLE GOVERNING AUTHORITIES. GENERAL NOTES ARE PROVIDED, HOWEVER THE CONTRACTOR SHALL REFER TO THE SPECIFICATIONS AND DETAILS FOR ADDITIONAL CONSIDERATIONS.

6. ALL TRENCHES WITHIN THE RIGHT-OF-WAY SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY, ALL OTHER TRENCHES SHALL BE COMPACTED TO 90% OF STANDARD PROCTOR DENSITY **PRIOR TO INSTALLATION OF SEWER SYSTEM AND DURING BACKFILL** TO PREVENT SETTLEMENT AND DAMAGE TO PAVING AND PIPELINE. "SEWER SYSTEM" INCLUDES, BUT IS NOT LIMITED TO, MAINS, LATERALS, MANHOLES, APPURTENANCES, PUMP STATIONS, FORCE MAINS, ETC. STANDARD PROCTOR TESTING SHALL BE IN CONFORMANCE WITH ASTM D698. ALL FILL IS TO BE FREE OF ROOTS, TRASH, AND ORGANIC MATTER AND SHALL BE PLACED IN 6" LIFTS. NO STONE LARGER THAN SIX (6) INCHES SHALL BE USED AS BACKFILL. FOR TRENCHES OUTSIDE OF A PAVED SURFACE, THE TOP 6" LIFT SHALL BE SCREENED ORGANIC TOPSOIL AND BE PERMANENTLY STABILIZED WITH VEGETATIVE COVER. COMPACTION TESTING OF ALL FILLS AND BACKFILLS SHALL BE CONDUCTED BY A THIRD-PARTY TESTING FIRM DURING NEW SEWER SYSTEM INSTALLATION IN ACCORDANCE WITH METRO TECHNICAL SPECIFICATIONS. METRO RESERVES THE RIGHT TO REQUEST OF THE ENGINEER EVIDENCE OF PASSING COMPACTION TESTS AT ANY TIME DURING OR AFTER CONSTRUCTION.

7. ALL PVC PIPE SHALL BE SDR 26 OR C-900 DR-18 MEETING ASTM STANDARDS. ALL DIP SEWER PIPE SHALL BE THICKNESS CLASS 50 OR PRESSURE CLASS 350. DUCTILE IRON PIPE MEETING ANSI/AWWA STANDARDS WITH TNEMEC 431 INTERIOR COATING. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REVISION OF ASTM D2321 (PVC AND DIP) AND APPLICABLE ANSI/AWWA C600 STANDARDS (DIP) AND IN CONFORMANCE WITH THE STANDARD DETAIL, LATEST REVISION.

8. MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF FOUR (4) FEET AND BE PRECAST 4000 PSI REINFORCED CONCRETE CONFORMING TO ASTM C-478 WITH PREFORMED OPENINGS. THE MANHOLE SHALL BE CONSTRUCTED WITH A FLOW CHANNEL TO PROVIDE A SMOOTH CONNECTION BETWEEN THE INLET AND THE OUTLET INVERTS.

9. NO CONNECTION SHALL BE MADE TO THE MANHOLE BETWEEN 18" & 5' ABOVE THE INVERT OUT. THE MINIMUM DROP (INSIDE OR OUTSIDE) SHALL BE NO LESS THAN 5'.

GENERAL NOTES

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Review Date: January 28, 2026

10. EACH INDIVIDUALLY OWNED PARCEL AND/OR EACH BUILDING HAVING PLUMBING FIXTURES INSTALLED SHALL HAVE AT LEAST ONE DIRECT AND INDIVIDUAL CONNECTION TO A WASTEWATER MAIN WITHOUT CROSSING ADJACENT PROPERTY LINES. (A.) NEW CONNECTIONS CONSTRUCTED AS PART OF A NEW MAIN INSTALLATION SHALL BE ACCOMPLISHED WITH A TEE-WYE FITTING AND SET AT THE 10 OR 2 O'CLOCK POSITION. THE LONG BRANCH OF THE TEE-WYE SHALL HAVE THE SAME INSIDE DIAMETER AS THE MAIN. STRAIGHT TEE CONNECTIONS MUST BE APPROVED BY METROCONNECTS. CONTRACTOR SHALL EXTEND THE NEW 6" LATERAL TO THE EDGE OF THE PERMANENT SEWER RIGHT-OF-WAY OR ROAD RIGHT-OF-WAY. TEMPORARY PLUG MAY BE SDR 26 OR SDR 35 PVC. THERE SHALL BE A MINIMUM OF 5' SEPARATION BETWEEN SERVICE TEE-WYES.

11. SERVICE CONNECTIONS SHALL BE A MINIMUM OF THREE (3) FEET FROM PIPE JOINTS OR MANHOLES MEASURED FROM THE NEAREST EDGE OF THE TEE-WYE FITTING.

12. THE CONTRACTOR SHALL NOT CONNECT SERVICE LATERALS TO EXISTING OR NEW MANHOLES WITHOUT PRIOR WRITTEN APPROVAL FROM METRO.

13. THE END OF THE SERVICE LATERAL SHALL BE MARKED BY A 2" MARKER PIPE OR A 2" X 4" TREATED POST PAINTED GREEN DRIVEN A MINIMUM OF THREE (3) FEET AND PROTRUDING APPROXIMATELY THREE (3) FEET ABOVE FINAL GRADE.

14. NO FLOW MAY BE DISCHARGED INTO A NEWLY CONSTRUCTED SANITARY SEWER MAIN UNTIL A PERMIT TO OPERATE HAS BEEN OFFICIALLY ISSUED BY SCDES AND A COPY HAS BEEN RECEIVED BY METRO.

15. PRESSURE TEST TO BE PERFORMED ON ALL LINES. DEFLECTION TEST TO BE PERFORMED ON ALL PVC LINES NO EARLIER THAN 30 DAYS AFTER INSTALLATION IS COMPLETE. ALL MANHOLES SHALL BE VACUUM TESTED. ALL TESTING TO BE PERFORMED IN THE PRESENCE OF A METRO REPRESENTATIVE AND A REPRESENTATIVE OF THE DESIGN ENGINEER. ALL TESTS SHALL BE IN CONFORMANCE WITH METRO AND SCDES SPECIFICATIONS.

16. THE CONTRACTOR SHALL PROVIDE TO THE DESIGN ENGINEER A RECORD DRAWING OF THE SANITARY SEWER SYSTEM. THE DRAWINGS SHALL, AT A MINIMUM, INCLUDE THE SANITARY SEWER MAIN AND MANHOLE LOCATIONS, PIPE MATERIAL FOR THE MAIN AND THE SERVICE LATERALS, THE DISTANCE OF EACH SERVICE CONNECTION TO THE DOWNSTREAM MANHOLE, LENGTH OF EACH SERVICE LATERAL, AND THE LOCATION AND DEPTH OF EACH SERVICE LATERAL TERMINUS. THE ENGINEER SHALL USE THIS DOCUMENTATION AS WELL AS INFORMATION OBTAINED BY A SURVEYOR TO PREPARE RECORD DRAWINGS. THE ENGINEER CANNOT APPLY FOR FINAL APPROVAL UNTIL THIS INFORMATION IS OBTAINED FROM THE CONTRACTOR.

17. ALL WORK ON SEWER LINES MUST BE COMPLETED BY A WL-WATER AND SEWER LINES LICENSED PLUMBER OR CONTRACTOR (SC LLR).

18. ALL NEW CONNECTIONS TO EXISTING MANHOLES WILL MATCH CROWN OF INFLOW MAIN.

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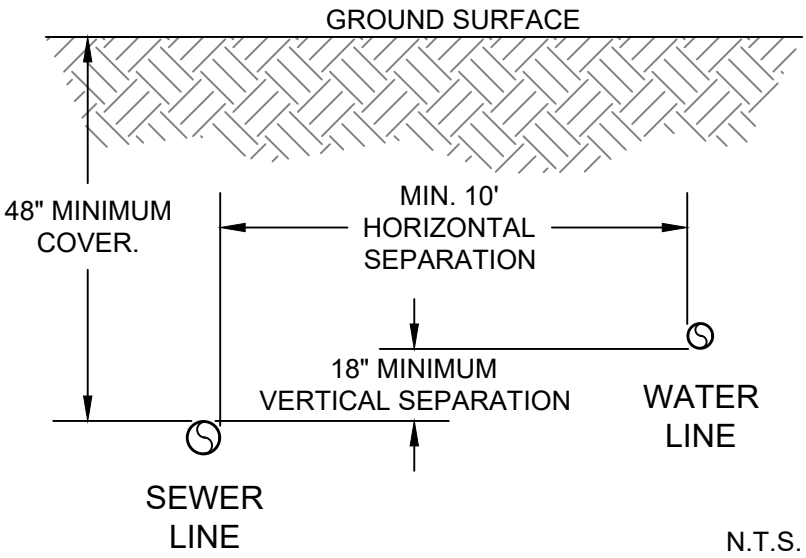
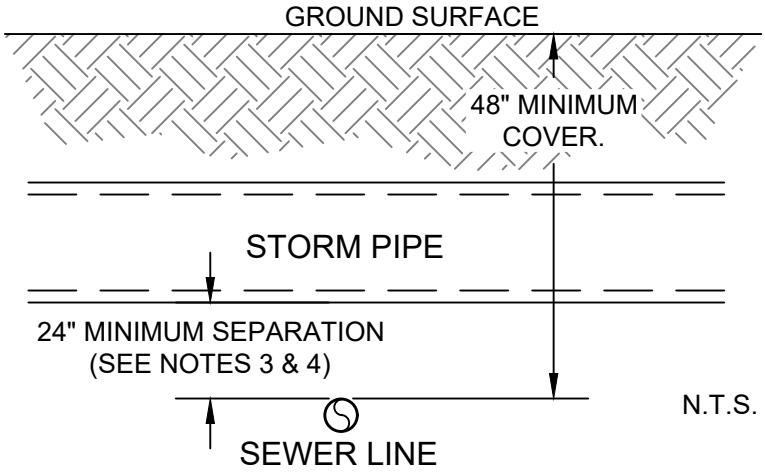


SANITARY SEWER AND WATER SEPARATION



SANITARY SEWER AND STORM SEPARATION (STORM PIPE ABOVE SANITARY SEWER)

NOTES:

1. ALL MEASUREMENTS ARE FROM OUTSIDE OF PIPES.
2. IF **WATER MAIN** SEPARATION IS LESS THAN 18" (ABOVE OR BELOW SEWER), DIP WILL BE REQUIRED.
3. 24" DIAMETER OR LESS STORM PIPE REQUIRES A 24" MINIMUM SEPARATION FROM SDR 26 PVC, GREATER THAN 24" IN DIAMETER WILL REQUIRE 36" MINIMUM SEPARATION FROM SDR 26 PVC.
4. IF SEPARATION FROM STORM IS LESS THAN 24", DIP OR C900 WILL BE REQUIRED. MINIMUM SEPARATION OF 12" REQUIRED ABOVE OR BELOW SEWER REGARDLESS OF STORM PIPE SIZE.
5. **ANY DEVIATION MUST BE APPROVED BY METROCONNECTS AND MEET SCDES STANDARDS**.

SANITARY SEWER, WATER AND STORM PIPE SEPARATIONS

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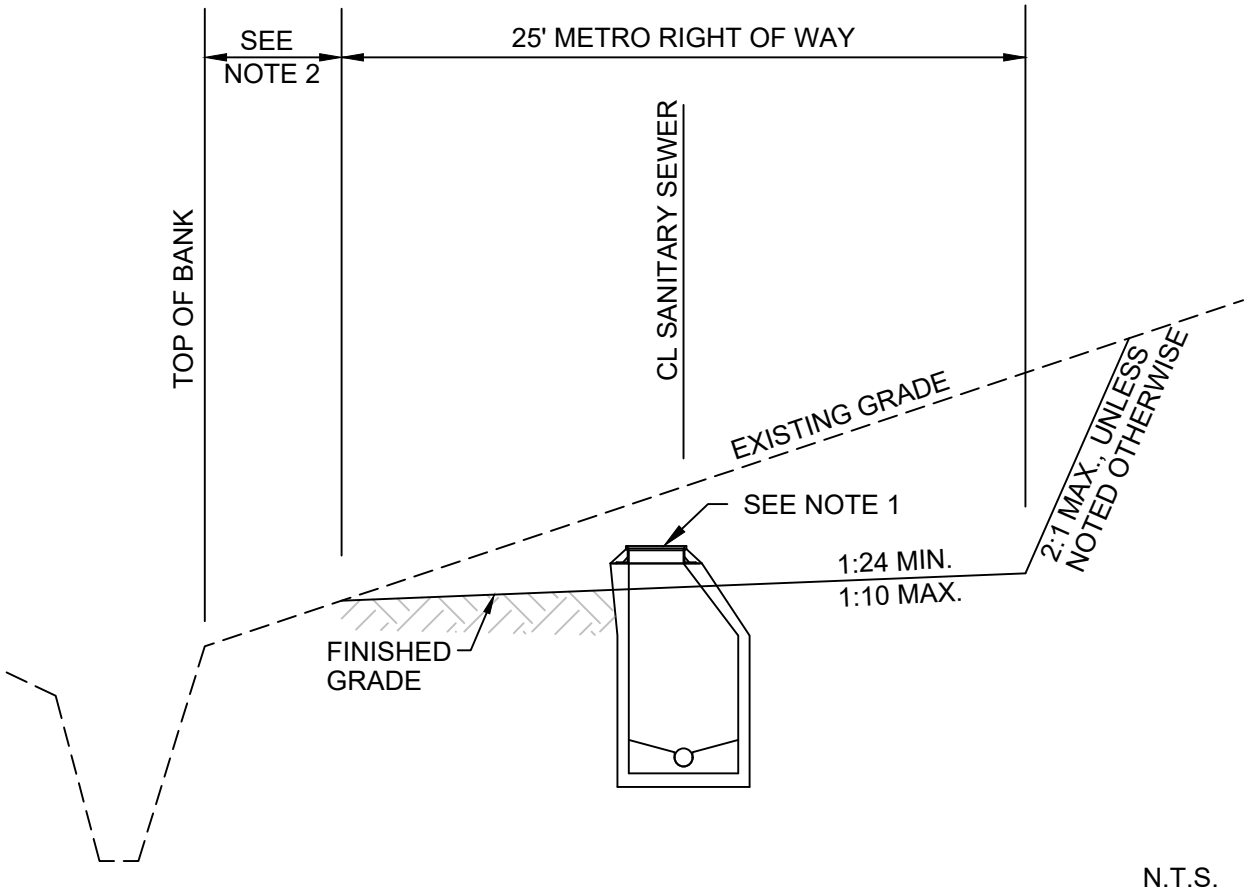

N.T.S.

NOTES:

1. RIM ELEV. SHALL BE SET IN ACCORDANCE TO MANHOLE AND RIM ELEVATION DETAILS
2. MINIMUM SEPARATION FROM TOP OF BANK SHALL BE:
   - 5' - FOR DRAINAGE SWALES AND DITCHES
   - 15' - FOR CREEKS
   - 25' - FOR RIVERS
3. NO EXCAVATION, FILLING OR STOCKPILING MATERIALS MAY TAKE PLACE WITHIN METRO RIGHT OF WAY WITHOUT CONTACTING METRO AND OBTAINING PERMISSION.
4. FENCES ARE NOT PERMITTED IN THE 25' METRO RIGHT OF WAY PARALLEL TO THE SEWER LINE. WRITTEN CONSENT IS REQUIRED WHERE A FENCE CROSSES THE METRO RIGHT OF WAY
5. MAX VERTICAL AND HORIZONTAL SLOPE WITHIN THE RIGHT OF WAY TO BE 1:10.

METROCONNECTS STANDARD RIGHT OF WAY

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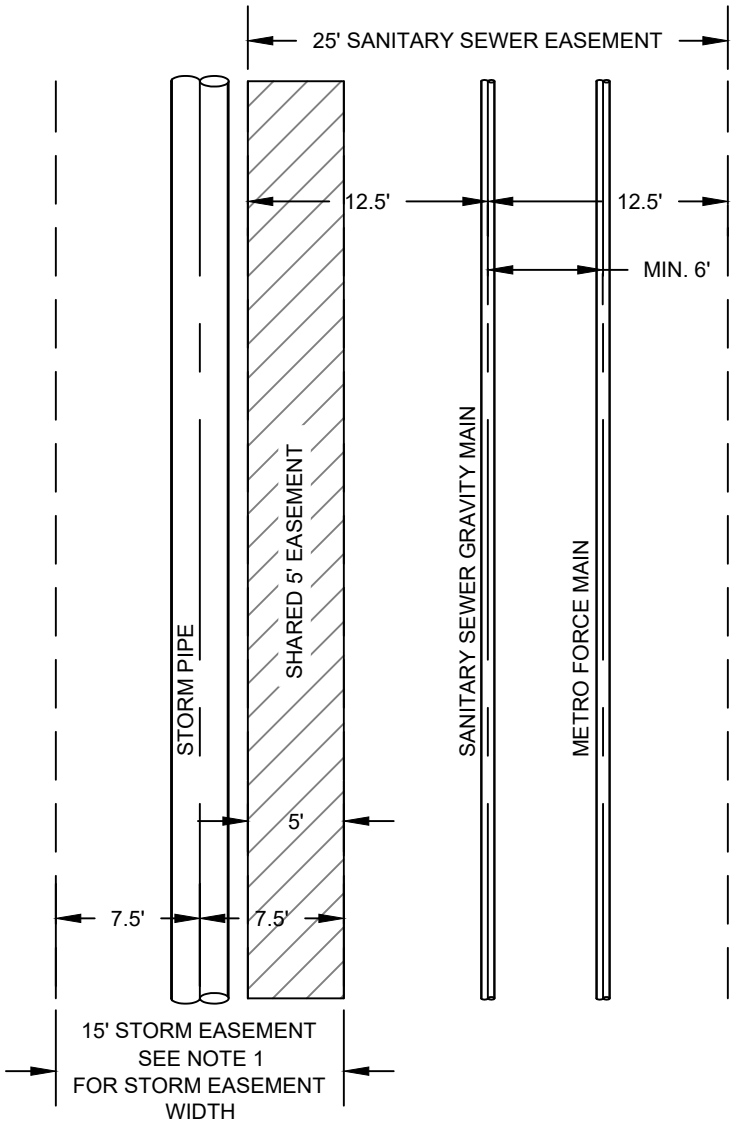

NOTES:

1. STORM EASEMENT SHOWN HAS A TOTAL WIDTH OF 15' (DEPENDING ON SIZE OF STORM PIPE) EASEMENT COULD BE UP TO 30' WIDE. **MAXIMUM OVERLAP OF SANITARY SEWER EASEMENT IS 5'.**

SHARED EASEMENTS

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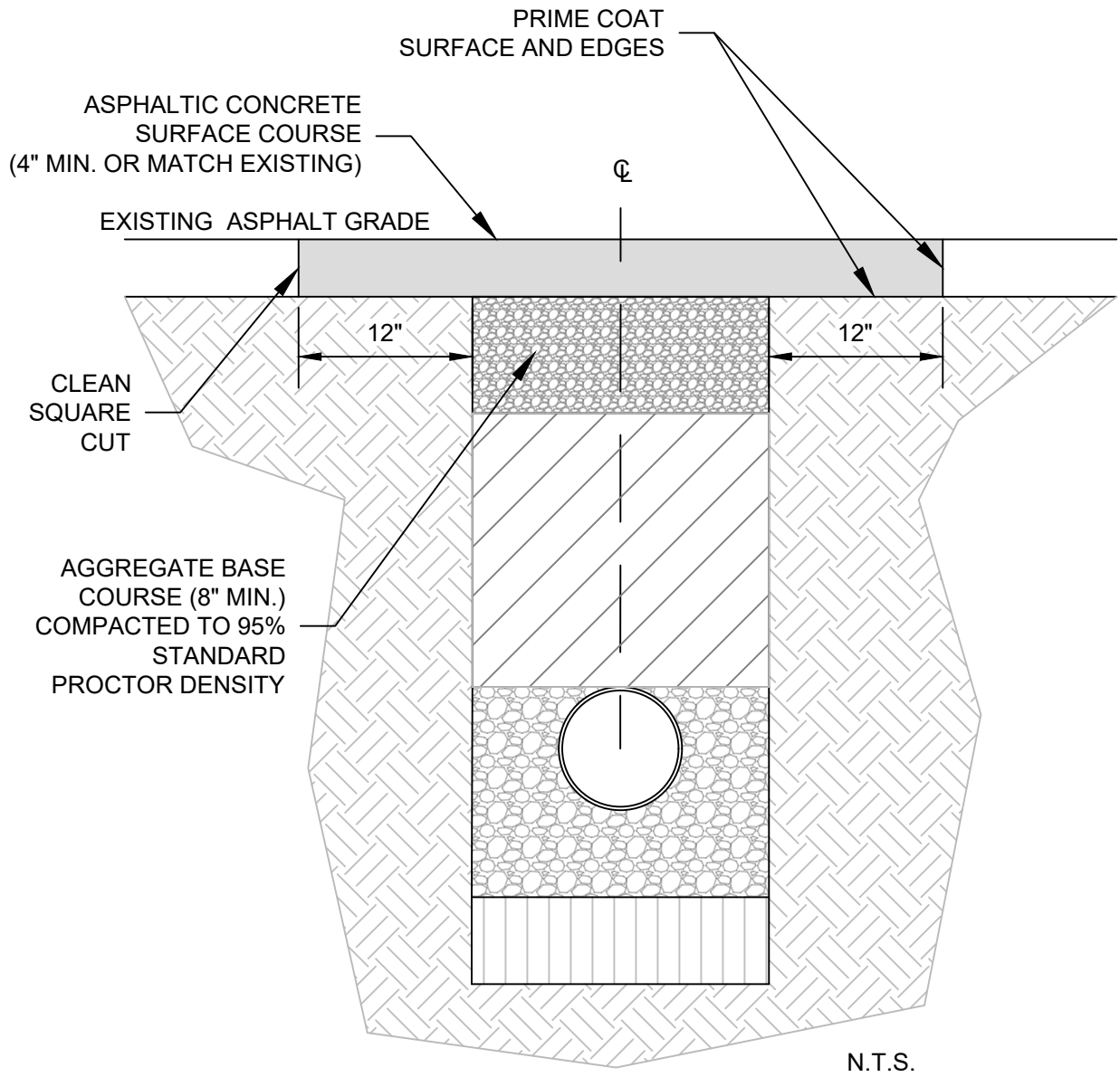

NOTES:
1. SEE PIPE EMBEDMENT DETAILS FOR TRENCH COMPACTION AND MATERIAL.
2. ALL OPEN CUT REPAIRS TO MEET CURRENT GREENVILLE COUNTY OR SCDOT STANDARDS.

ASPHALT PATCH

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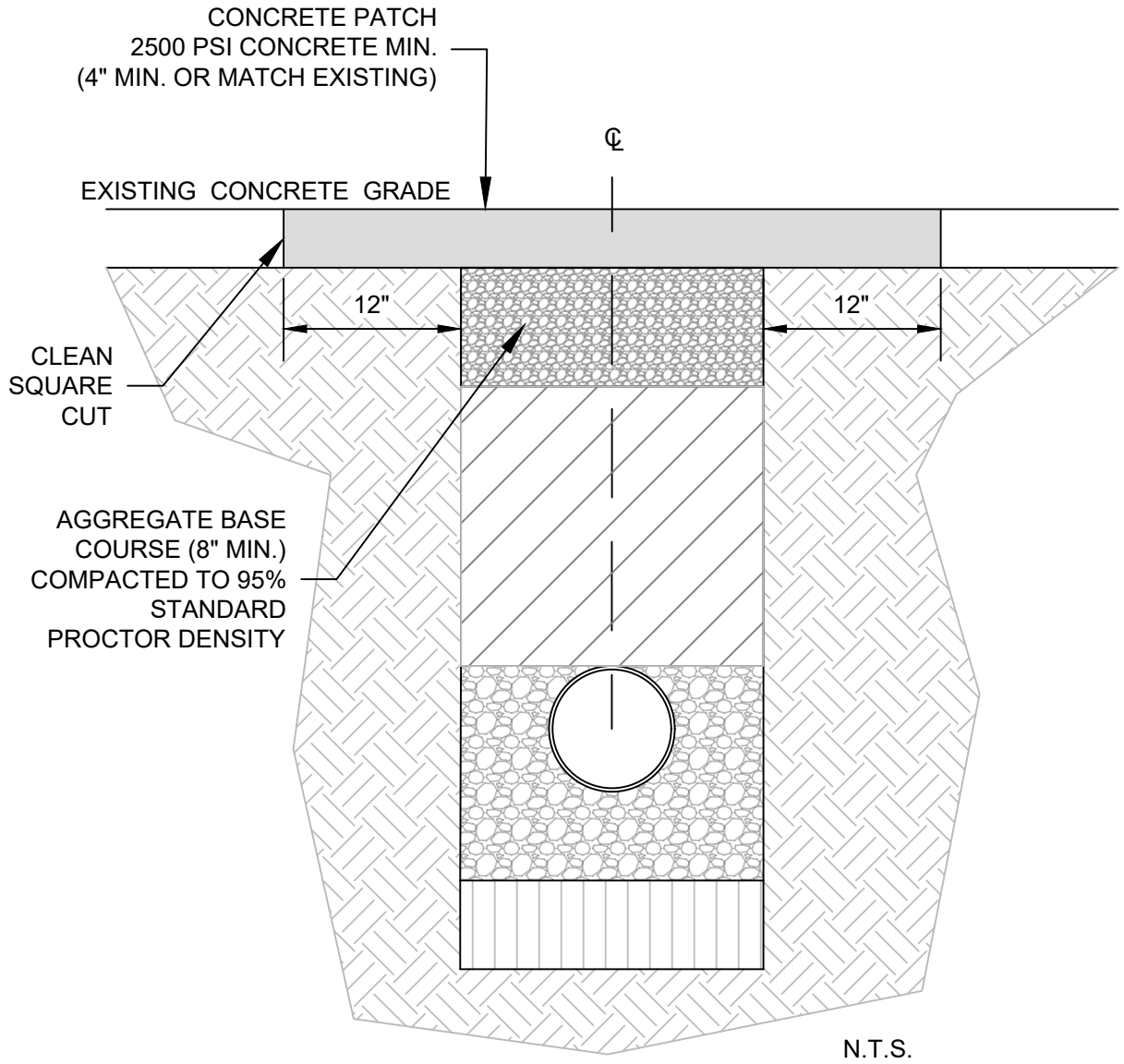

NOTES:
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2. ALL OPEN CUT REPAIRS TO MEET CURRENT GREENVILLE COUNTY OR SCDOT STANDARDS.

CONCRETE PATCH

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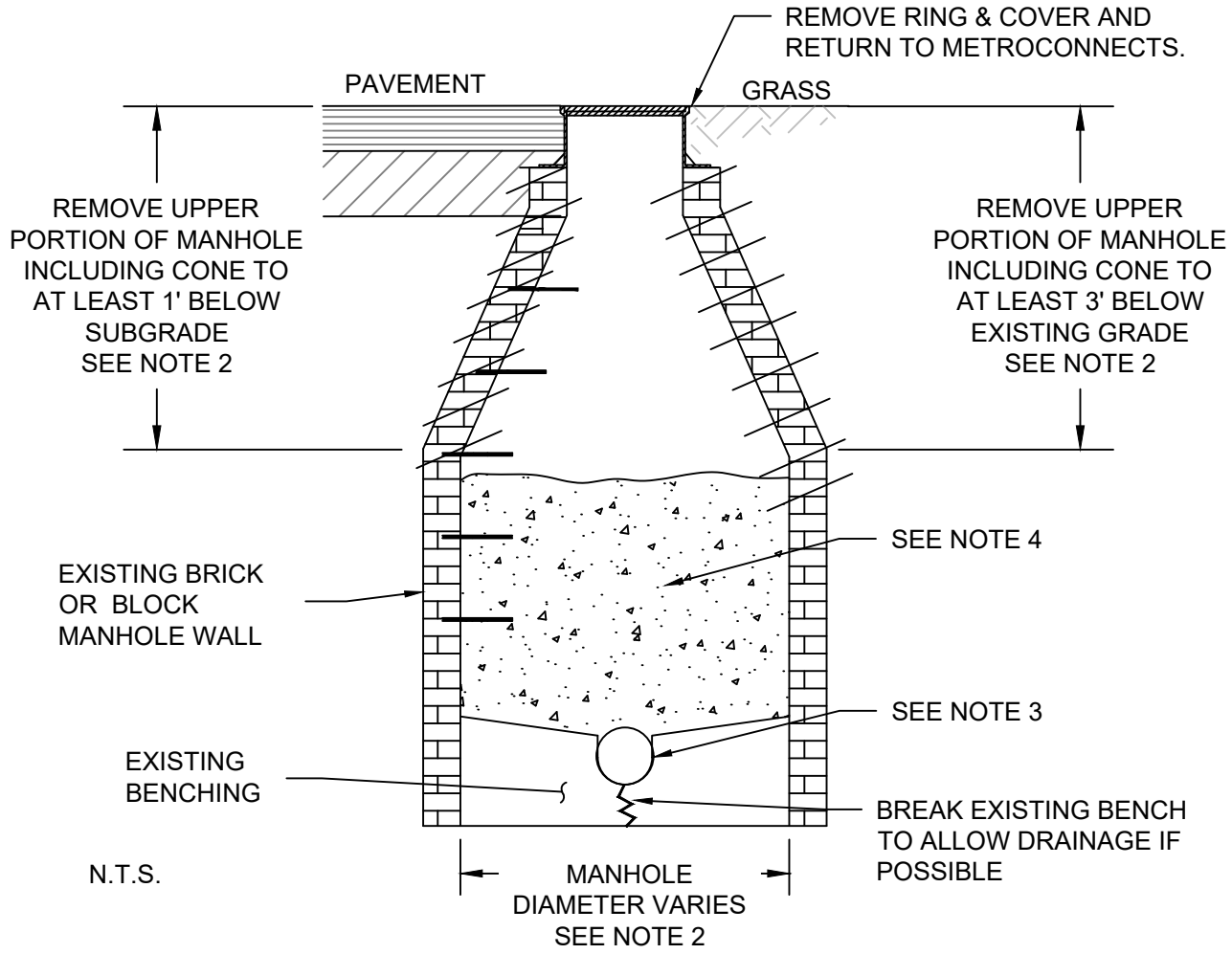

NOTES:

1. THIS DETAIL DEPICTS AN EXISTING BRICK/BLOCK MANHOLE WITH A TYPICAL CHIMNEY SECTION. MANHOLE SHAPES AND DIAMETERS WILL VARY.
2. REMOVE THE UPPER PORTION, INCLUDING CONE SECTION OF STRUCTURES TO A DEPTH OF AT LEAST 1 FOOT BELOW SUBGRADE IN PAVED AND FOUNDATION AREAS. FOR ALL OTHER AREAS, REMOVE ALL OF THE CONE SECTION TO A DEPTH OF 3 FEET BELOW FINISHED OR EXISTING GRADE, WHICHEVER IS LOWER. THE BOTTOM OF STRUCTURES SHALL BE BROKEN OR PERFORATED TO PREVENT THE ENTRAPMENT OF WATER.
3. SEAL ALL CONDUITS CONNECTION TO THE STRUCTURES OR ENDS OF CONDUIT TO BE ABANDONED WITH A WALL OF CONCRETE NOT LESS THAN 6 INCHES THICK OR AN 8-INCH WALL OF BRICK AND MORTAR.
4. FILL STRUCTURAL VOIDS WITH SUITABLE MATERIAL TO 90% (UNPAVED) OR 95% (PAVED) OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DEFINED BY ASTM D698.
5. BACKFILL AND COMPACT REMAINDER OF TRENCH WITH SUITABLE BACKFILL. IN CONFORMANCE WITH STANDARD SPECIFICATIONS.

BRICK MANHOLE ABANDONMENT

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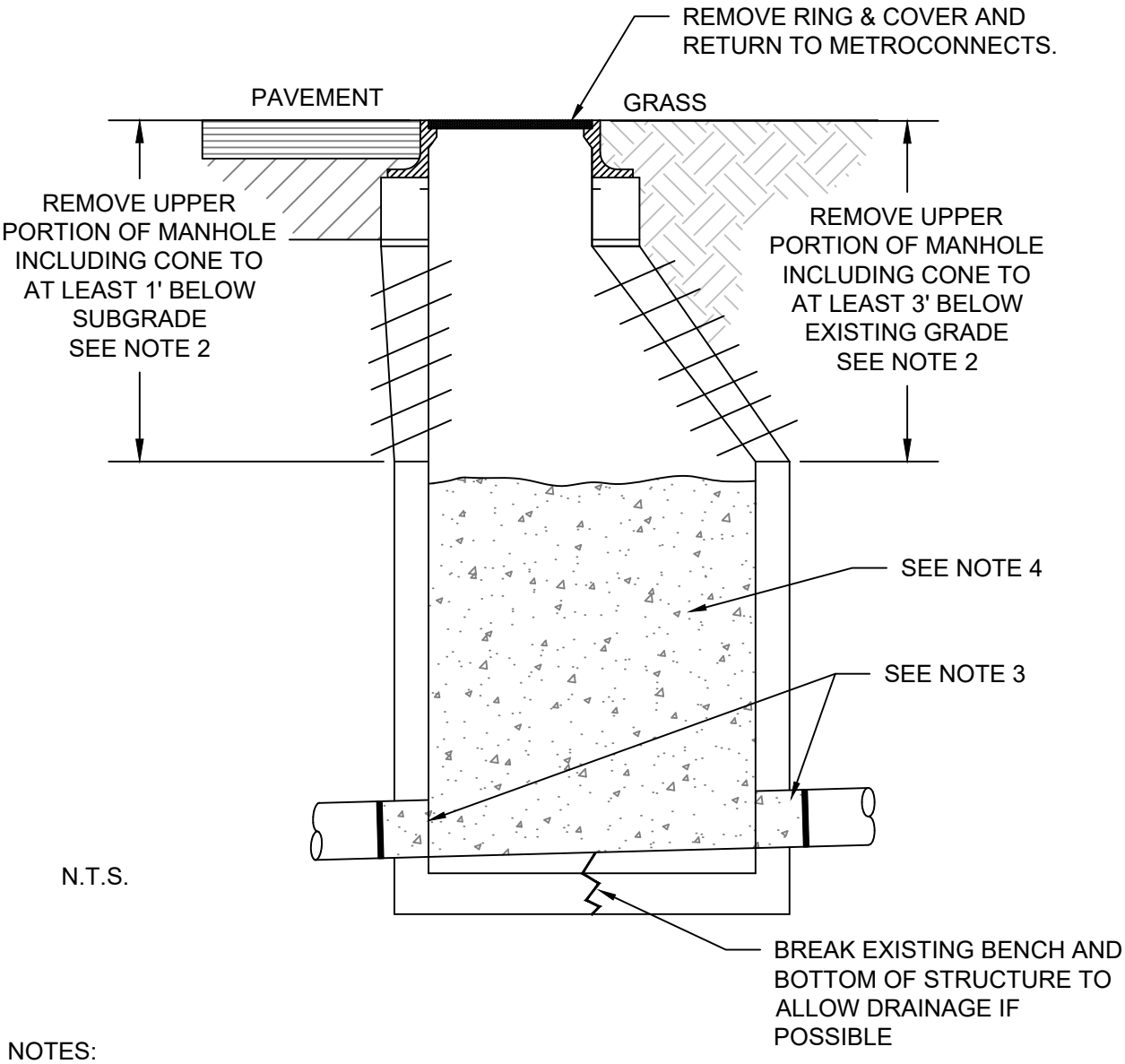

NOTES:

1. MANHOLE SHAPES AND DIAMETERS WILL VARY.
2. REMOVE ALL OF THE CONE SECTION TO A DEPTH OF 3 FEET BELOW FINISHED OR EXISTING GRADE. THE BOTTOM OF STRUCTURES SHALL BE BROKEN OR PERFORATED TO PREVENT THE ENTRAPMENT OF WATER.
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4. FILL STRUCTURAL VOIDS WITH SUITABLE MATERIAL COMPACTED TO 90% (UNPAVED) OR 95% (PAVED) OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DEFINED BY ASTM D698.
5. BACKFILL AND COMPACT REMAINDER OF TRENCH WITH SUITABLE BACKFILL. IN CONFORMANCE WITH STANDARD SPECIFICATIONS.

PRECAST MANHOLE ABANDONMENT

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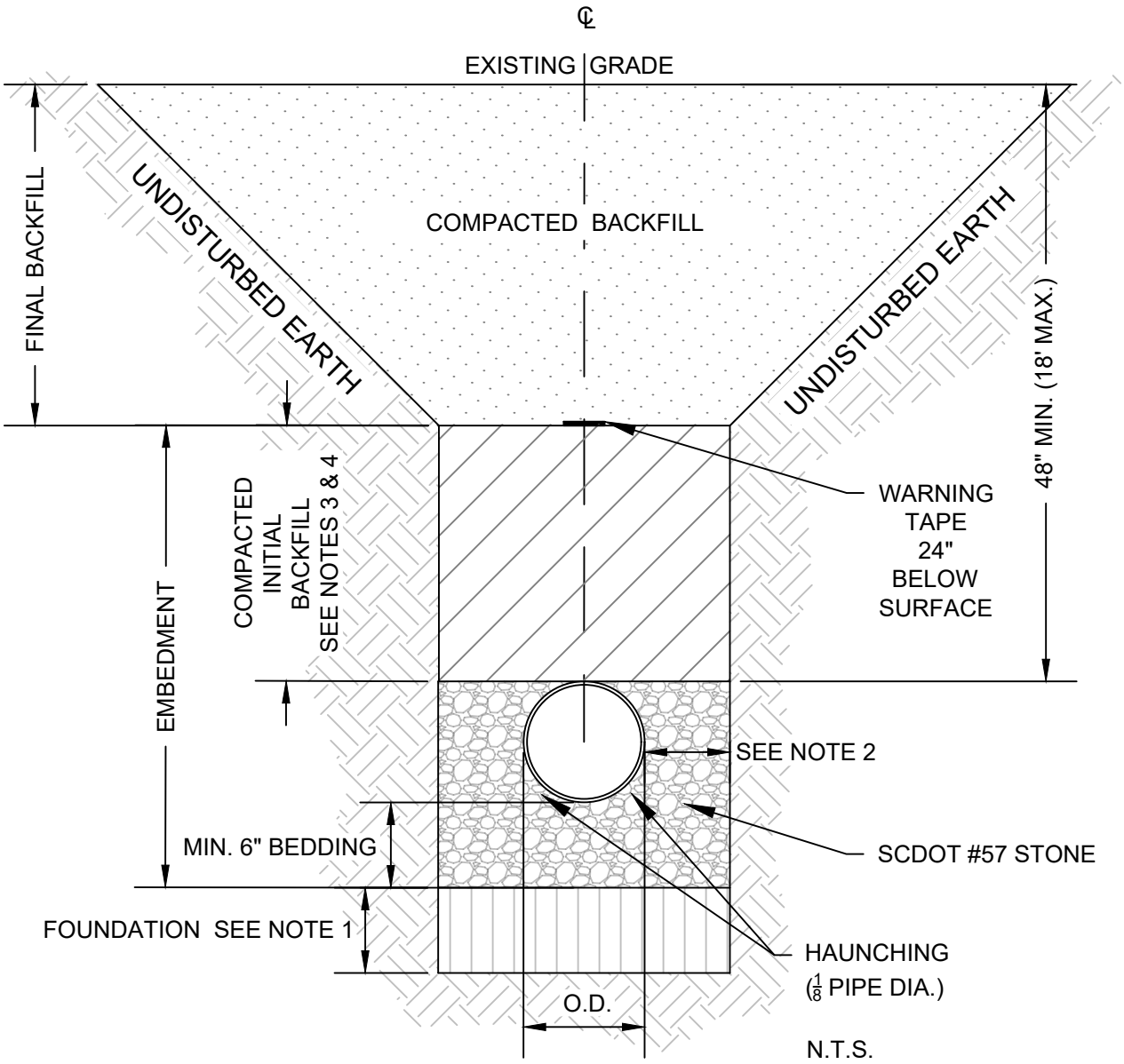

NOTES:

1. STABILIZATION STONE REQUIRED WHEN SOIL CONDITIONS ARE UNSTABLE.
2. CLEAR DISTANCE NOT LESS THAN 6" EACH SIDE.
3. 18" MINIMUM VERTICAL TRENCH WALL ABOVE TOP OF PIPE.
4. INITIAL BACKFILL SHALL BE PLACED IN 6" LIFTS AND COMPACTED. INITIAL BACKFILL SHALL CONTAIN NO MATERIAL OVER 1 1/2" IN DIAMETER, FROZEN LUMPS, OR DEBRIS.
5. ALL TRENCHES WITHIN THE RIGHT-OF-WAY SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AND ALL OTHER TRENCHES SHALL BE COMPACTED TO 90% OF STANDARD PROCTOR DENSITY.

GRAVITY PIPE EMBEDMENT - SDR 26 PVC

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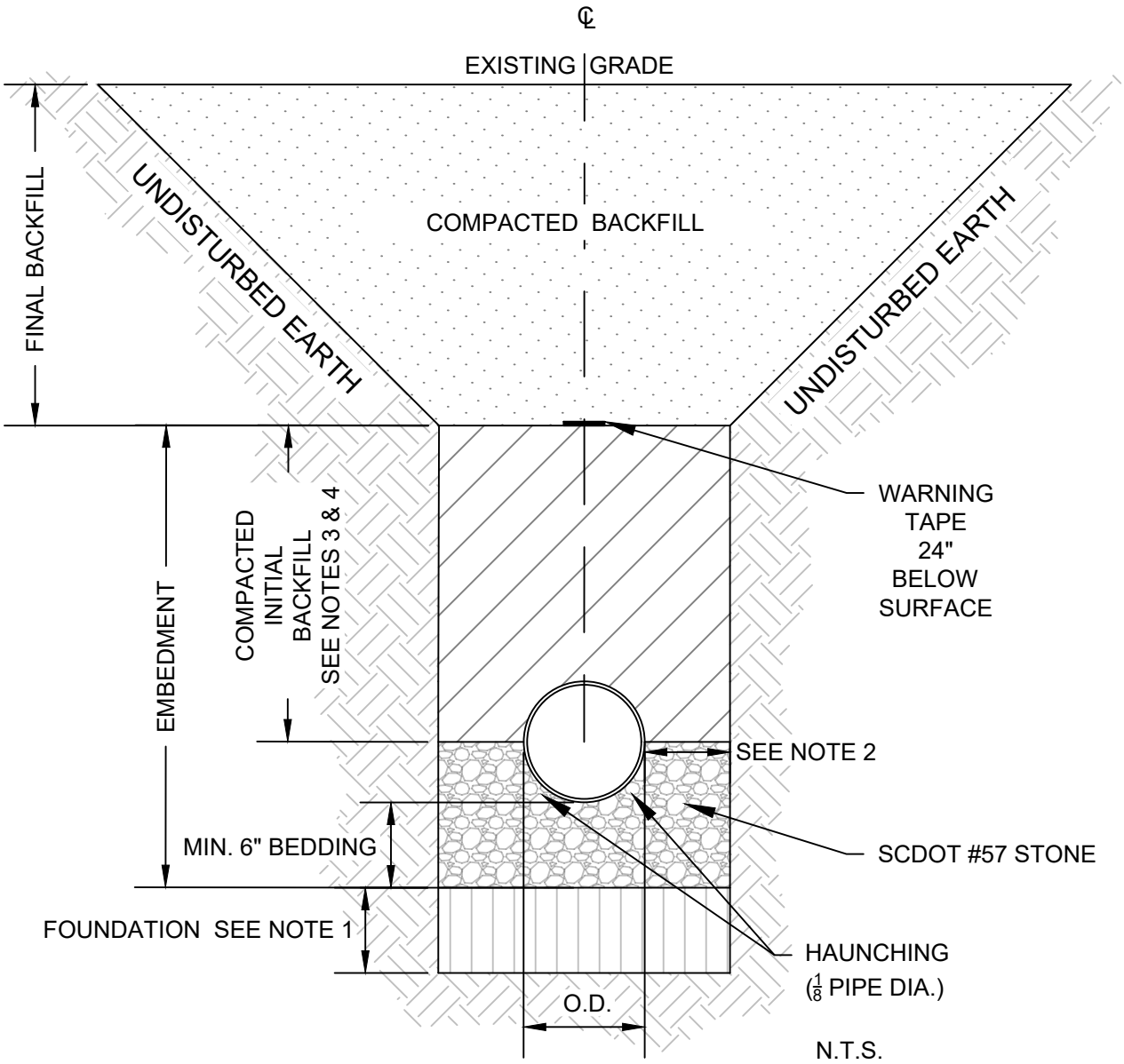

NOTES:

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GRAVITY PIPE EMBEDMENT - C-900 / DIP

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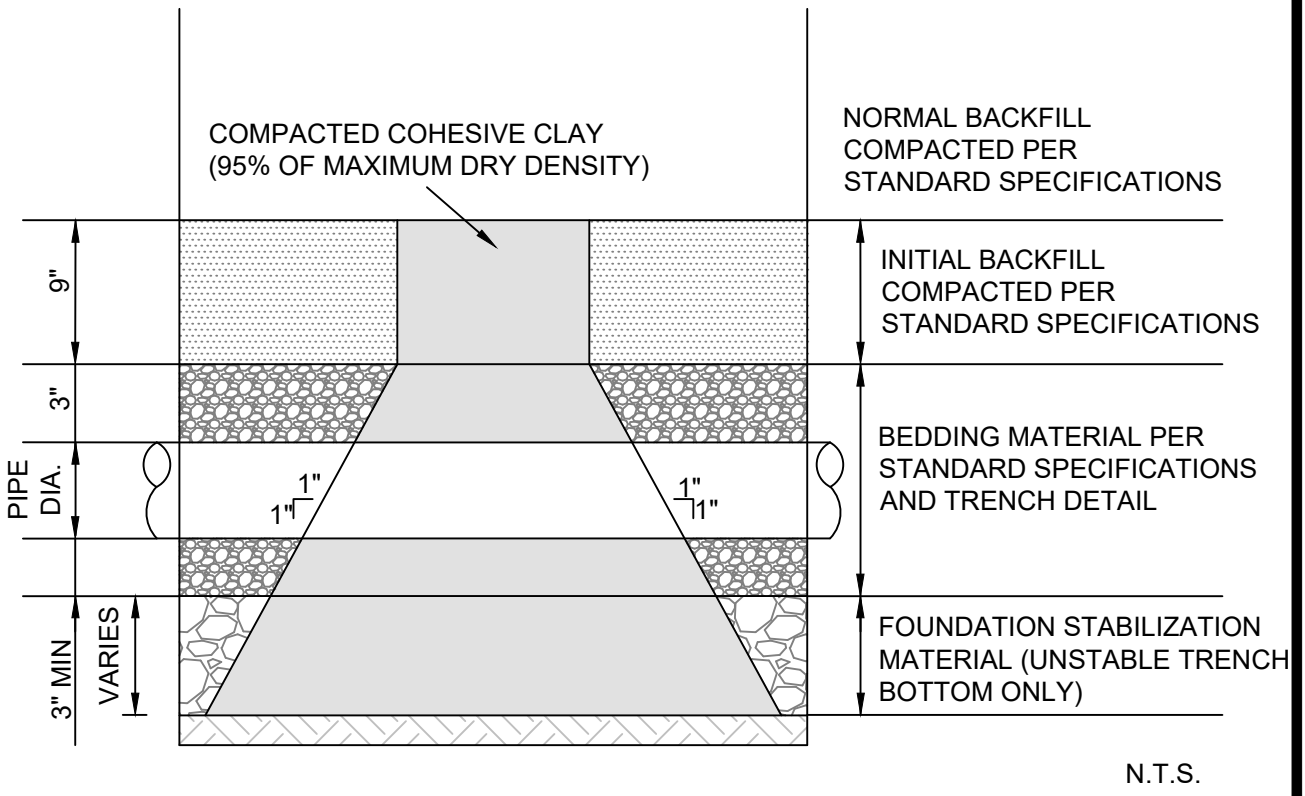

N.T.S.

NOTES:

1. DO NOT CONSTRUCT CHECK DAM AROUND PIPE JOINT.

2. CHECK DAM INSTALLATION LOCATIONS SHALL BE ON THE PLANS. HOWEVER DURING CONSTRUCTION, CHECK DAM INSTALLATION LOCATIONS MAY BE MOVED DUE TO FIELD CONDITIONS.

3. THE CHECK DAM SHALL EXTEND FROM THE BOTTOM OF THE EXCAVATION THROUGH THE BEDDING MATERIAL TO THE "NORMAL BACKFILL" AND SHALL EXTEND COMPLETELY TO EACH TRENCH SIDEWALL. CHECK DAM MATERIAL SHALL BE COMPACTED COHESIVE CLAY THAT CONTAINS A MINIMUM OF 25% PASSING NO. 200 SIEVE MATERIAL, WITH 70% PASSING FOR 3/4 IN SIEVE. IF THE NORMAL EXCAVATED MATERIAL IS NOT SUITABLE FOR CONSTRUCTION OF THE CHECK DAM, THEN THE CONTRACTOR SHALL OBTAIN THE MATERIAL FROM OUTSIDE SOURCES.

TRENCH CHECK DAM

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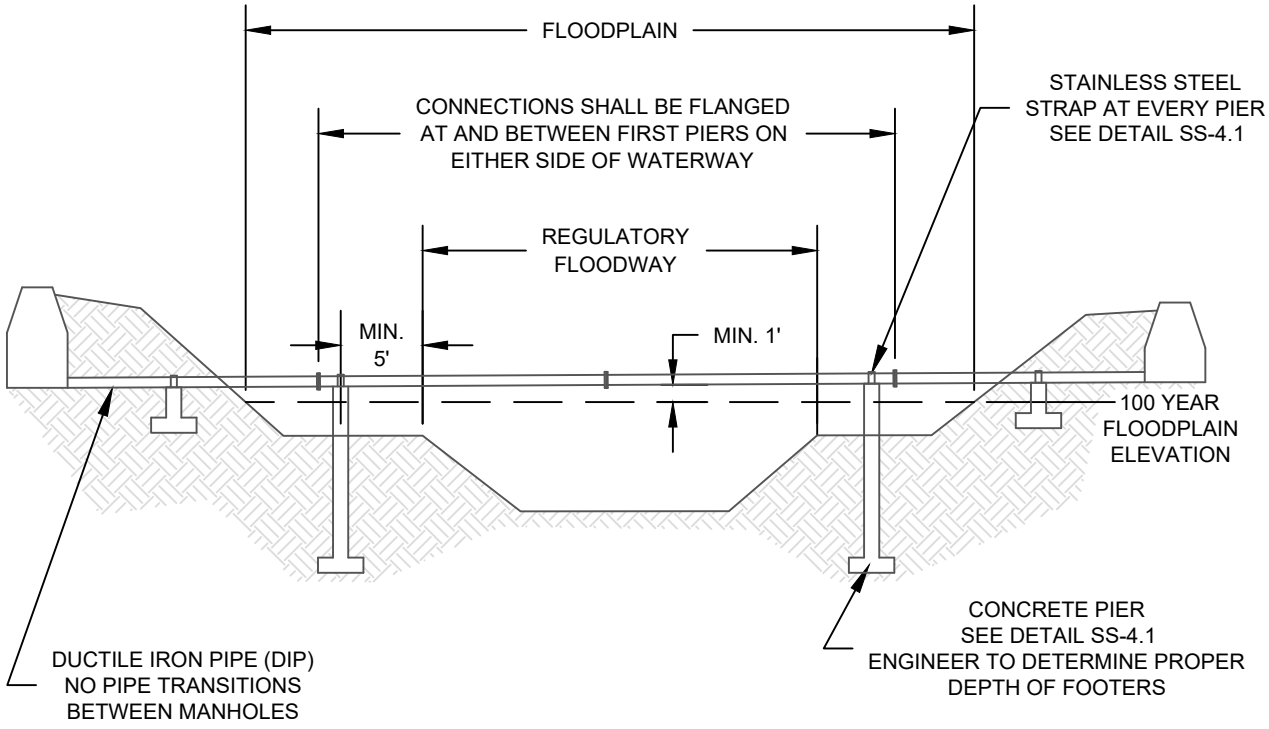
THE FOLLOWING NOTE (WITH PE SEAL AND SIGNATURE IMMEDIATELY BENEATH) ARE REQUIRED ON EACH DRAWING WITH AN AERIAL CROSSING:

I CONFIRM THAT THE COMPONENTS OF THE AERIAL CROSSING INCLUDING, BUT NOT LIMITED TO, PIERS, PIER FOOTINGS, PIPE SPANS, AND PIPE SPAN CONNECTIONS HAVE BEEN DESIGNED, AND THE REQUIRED GEOTECHNICAL AND STRUCTURAL ANALYSIS OF EACH COMPONENT HAVE BEEN PERFORMED, BY ME OR UNDER MY DIRECTION.



NOTES:

1. **DETAIL IS AN EXAMPLE**. EACH CROSSING WILL BE UNIQUE, ENGINEER TO COORDINATE WITH AND SUBMIT PLANS OF EACH CROSSING TO METRO FOR APPROVAL.
2. ENGINEER TO VERIFY EXISTING CONDITIONS (SOIL, ROCK) PRIOR TO DESIGN OF PIERS.
3. PLANS TO INCLUDE SURVEYED CROSS SECTION OF EXISTING CONDITIONS, STATION AND DEPTH OF EACH PIER.
4. LOAD CALCULATIONS ON PIERS MAY BE REQUIRED AT METROS DISCRETION.
5. GRAVITY MAIN TO HAVE A MINIMUM SLOPE OF 0.5%.
6. AERIAL DIP PIPE TO BE COATED WITH UV PROTECTANT APPROVED BY METROCONNECTS PRIOR TO INSTALL.
7. ENGINEER TO COORDINATE WITH ALL REGULATORY AGENCIES INCLUDING BUT NOT LIMITED TO GREENVILLE COUNTY FLOODPLAIN, ACOE AND GREENVILLE COUNTY LAND DEVELOPMENT AND OBTAIN ALL REQUIRED PERMITS.

AERIAL CROSSING

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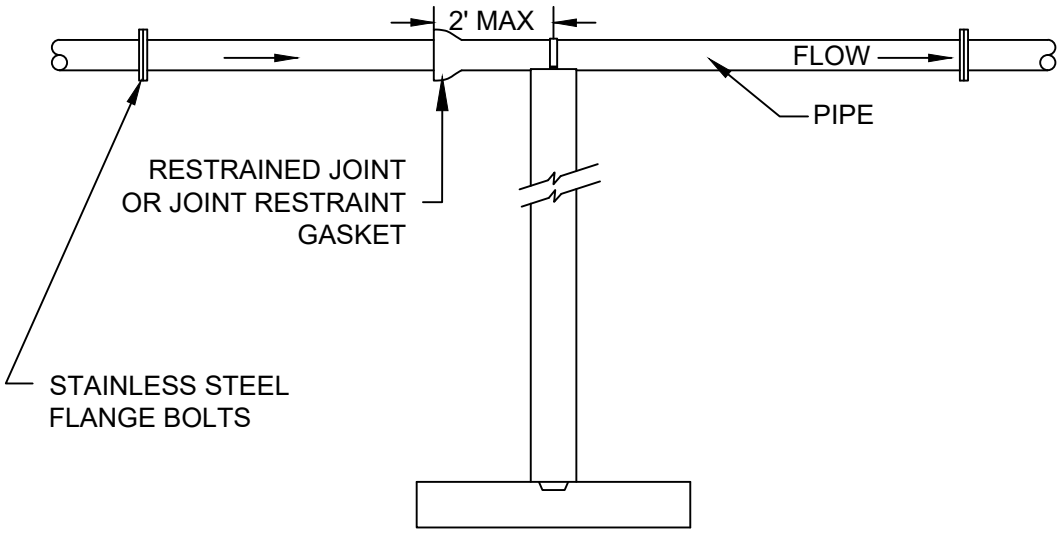
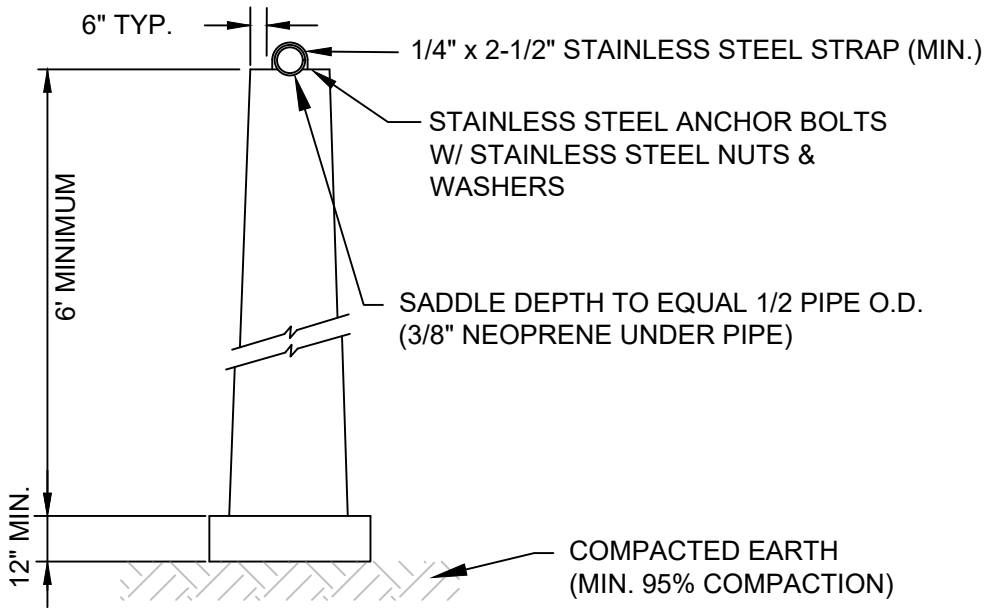
SS-4.0





N.T.S.

NOTES:

1. **DETAIL IS AN EXAMPLE**. ENGINEER TO VERIFY EXISTING CONDITIONS (SOIL, ROCK) PRIOR TO DESIGN OF PIERS.
2. TOP OF FOUNDATION SHALL BE LOCATED A MINIMUM OF 3 FEET BELOW STREAM BED FOR SOIL BEARING CONDITION. IF SOUND ROCK IS ENCOUNTERED BEFORE THIS ELEVATION IS REACHED, THEN USE DETAIL FOR ROCK BEARING PIER.
3. REFER TO LOW PIER DETAIL FOR PIERS SHORTER THAN 6 FEET IN HEIGHT.
4. PIERS MUST BE MONOLITHIC OR CAST IN PLACE.
5. CONCRETE SHALL DEVELOP A MIN. 4000 PSI COMPRESSIVE STRENGTH IN 28 DAYS.
6. ALL HARDWARE TO BE STAINLESS STEEL.
7. ALL PIPE JOINTS SHALL BE FLANGED OR RESTRAINED JOINTS. ALL RESTRAINED JOINTS MUST BE SUPPORTED WITHIN A MAXIMUM OF 2' FROM BELL.

STANDARD CONCRETE PIER

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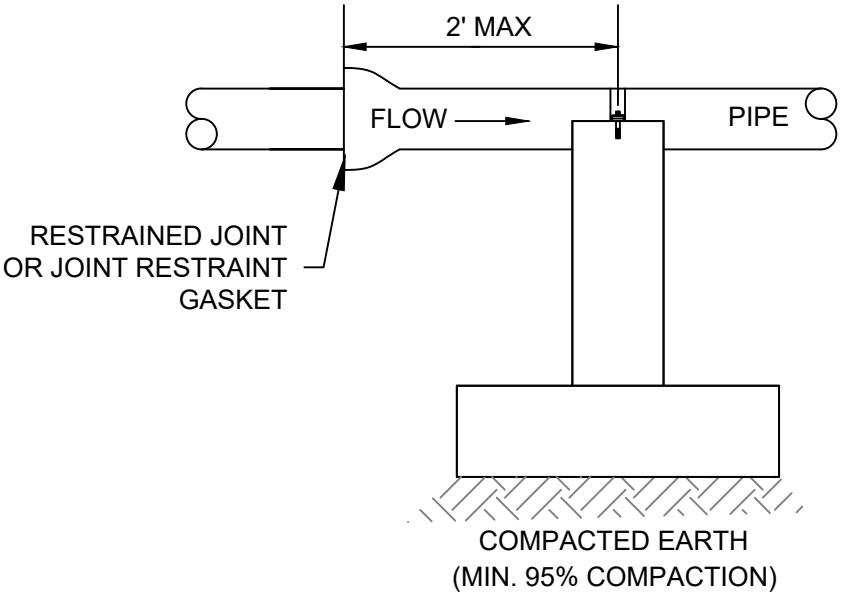

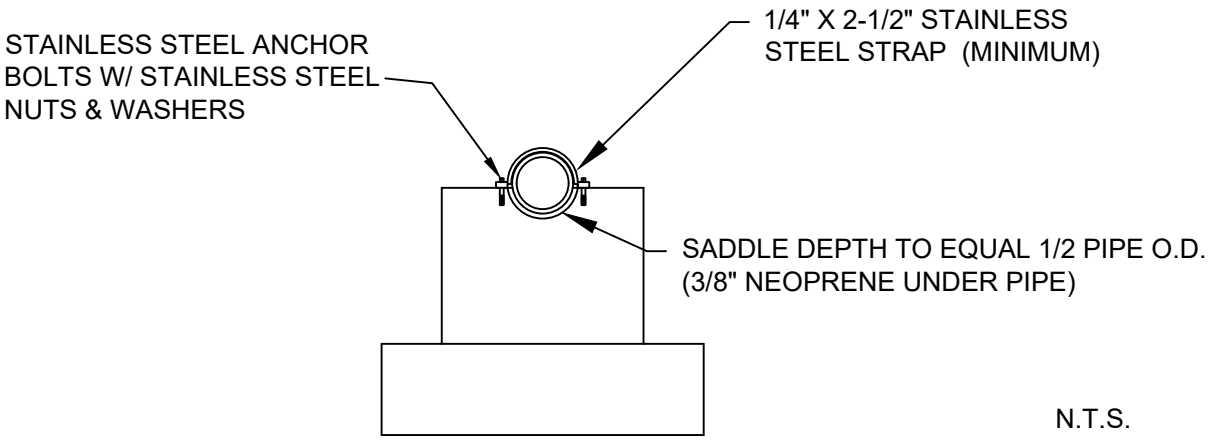

N.T.S.

NOTES:

1. **DETAIL IS AN EXAMPLE**. ENGINEER TO VERIFY EXISTING CONDITIONS (SOIL, ROCK) PRIOR TO DESIGN OF PIERS.
2. REFER TO CONCRETE PIER DETAIL FOR PIERS GREATER THAN 6'
3. CONCRETE SHALL DEVELOP A MIN. 4000 PSI COMPRESSIVE STRENGTH IN 28 DAYS
4. ALL HARDWARE TO BE STAINLESS STEEL.
5. ALL NON-MECHANICAL PIPE JOINTS SHALL BE SUPPORTED A MAX OF 2' FROM BELL.
6. PIERS MUST BE MONOLITHIC OR CAST IN PLACE.
7. ALL PIPE JOINTS SHALL BE FLANGED OR RESTRAINED JOINTS. ALL RESTRAINED JOINTS MUST BE SUPPORTED A MAX OF 2' FROM BELL.

LOW CONCRETE PIER

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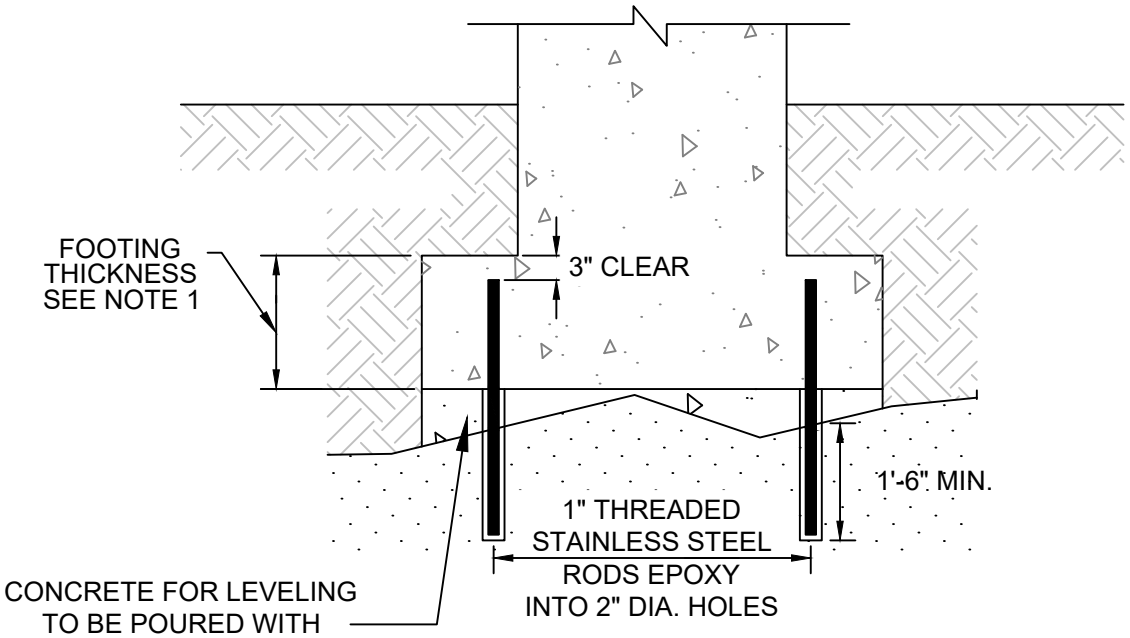
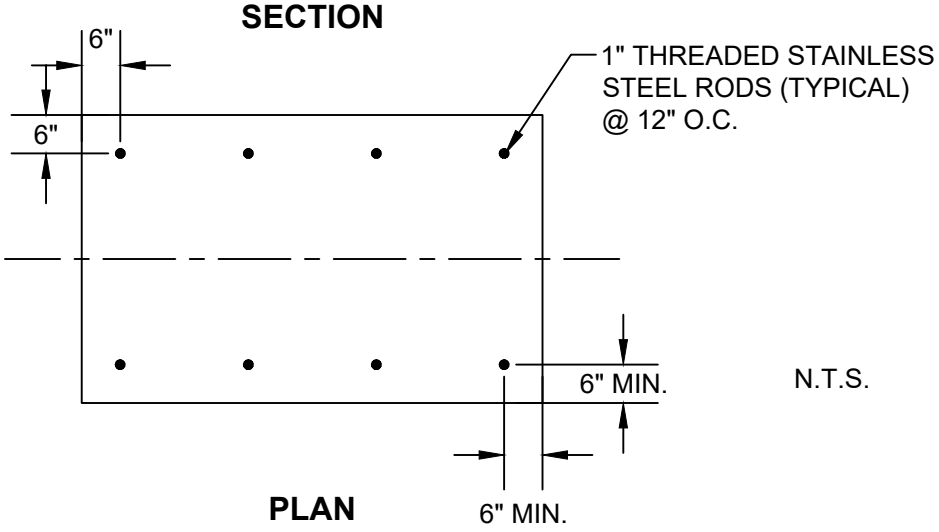


SECTION



PLAN

N.T.S.

NOTES:

1. **DETAIL IS AN EXAMPLE**. ENGINEER TO VERIFY EXISTING CONDITIONS (SOIL, ROCK) PRIOR TO DESIGN OF PIERS.
2. MINIMUM THICKNESS OF FOOTING ABOVE ROCK TO BE SAME AS BASE THICKNESS OF PIER.
3. MAT STEEL FOR FOOTING SHALL BE TIED TO DOWELS.
4. CONCRETE SHALL BE 4000 PSI COMPRESSIVE STRENGTH.
5. EPOXY PRODUCT SHALL MEET ASTM C881.

ROCK BEARING CONCRETE PIER

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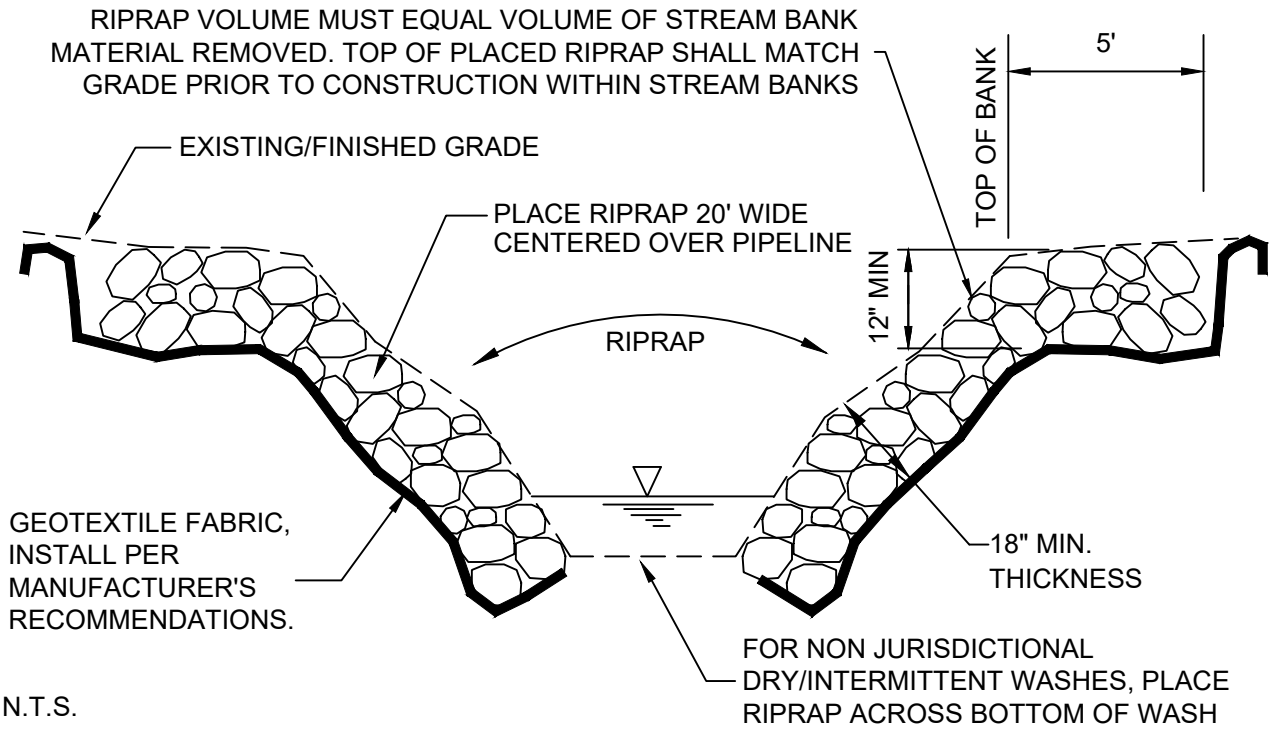

N.T.S.

NOTES:

1. GEOTEXTILE FABRIC SHALL BE MIRAFI FILTERWEAVE FW 500 OR APPROVED EQUAL.
2. RIPRAP SHALL BE HARD QUARRY OR FIELD STONE AND SHALL BE OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING. STONE FOR HAND PLACING TO A THICKNESS OF 12 INCHES SHALL BE CLASS B RIPRAP AND SHALL RANGE IN WEIGHT FROM A MINIMUM OF 5 POUNDS TO A MAXIMUM OF 200 POUNDS. AT LEAST 50% OF THE STONE PIECES SHALL WEIGH MORE THAN 37 POUNDS. AT LEAST 15% OF THE STONE SHALL WEIGH MORE THAN 75 POUNDS, EXCEPT SPALLS SHALL HAVE A MINIMUM DIMENSION OF AT LEAST 0.42'.
3. HEAVY DUTY RIPRAP SHALL BE USED AND PLACED AT A THICKNESS OF 24" MINIMUM, WHERE SHOWN ON THE PLANS. HEAVY DUTY RIPRAP SHALL BE CLASS C WITH MAXIMUM SIZE OF 1.8', AVERAGE SIZE IS 1.3', MINIMUM SIZE OF 0.4'. AT LEAST 50% OF THE STONE PIECES SHALL BE LARGER THAN 1.3'.
4. THE SLOPE UPON WHICH THE RIPRAP IS TO BE PLACED SHALL BE WORKED TO PROVIDE A CONSISTENT SLOPE FROM THE TOP OF BANK TO THE BOTTOM OF THE BANK. DEPRESSIONS SHALL BE FILLED IN AND PROPERLY COMPACTED.
5. RIPRAP PLACEMENT SHALL BEGIN AT THE TOE OF THE SLOPE AND PROGRESS UPWARD. EACH PIECE SHALL BE PLACED BY HAND PERPENDICULAR TO THE SLOPE AND SHALL BE FIRMLY EMBEDDED AGAINST THE SLOPE AND ADJOINING PIECES. THE SPACES BETWEEN THE LARGER PIECES SHALL BE FILLED WITH SPALLS OF SUITABLE SIZE WHICH SHALL BE RAMMED INTO PLACE. THE FINISHED SURFACE SHALL PRESENT AN EVEN, TIGHT SURFACE TRUE TO LINE, GRADE AND SECTION.

RIPRAP STREAM BANK STABILIZATION

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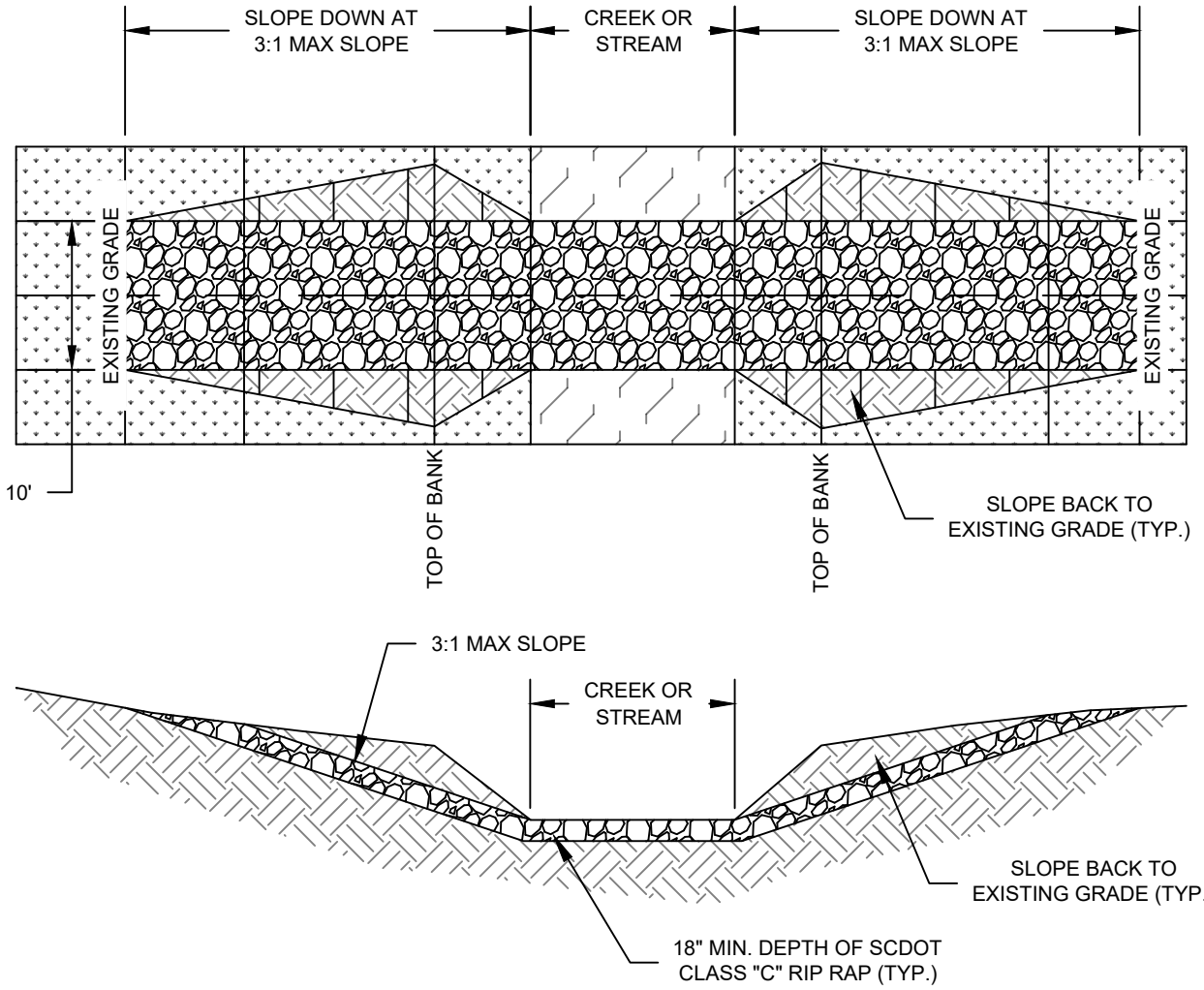

NOTES:
1. ENGINEER TO SUBMIT PLANS TO METRO.
2. ENGINEER TO COORDINATE WITH ALL REGULATORY AGENCIES INCLUDING BUT NOT LIMITED TO GREENVILLE COUNTY FLOODPLAIN, ACOE AND GREENVILLE COUNTY LAND DEVELOPMENT AND OBTAIN ALL REQUIRED PERMITS,.

FORDING STREAMS

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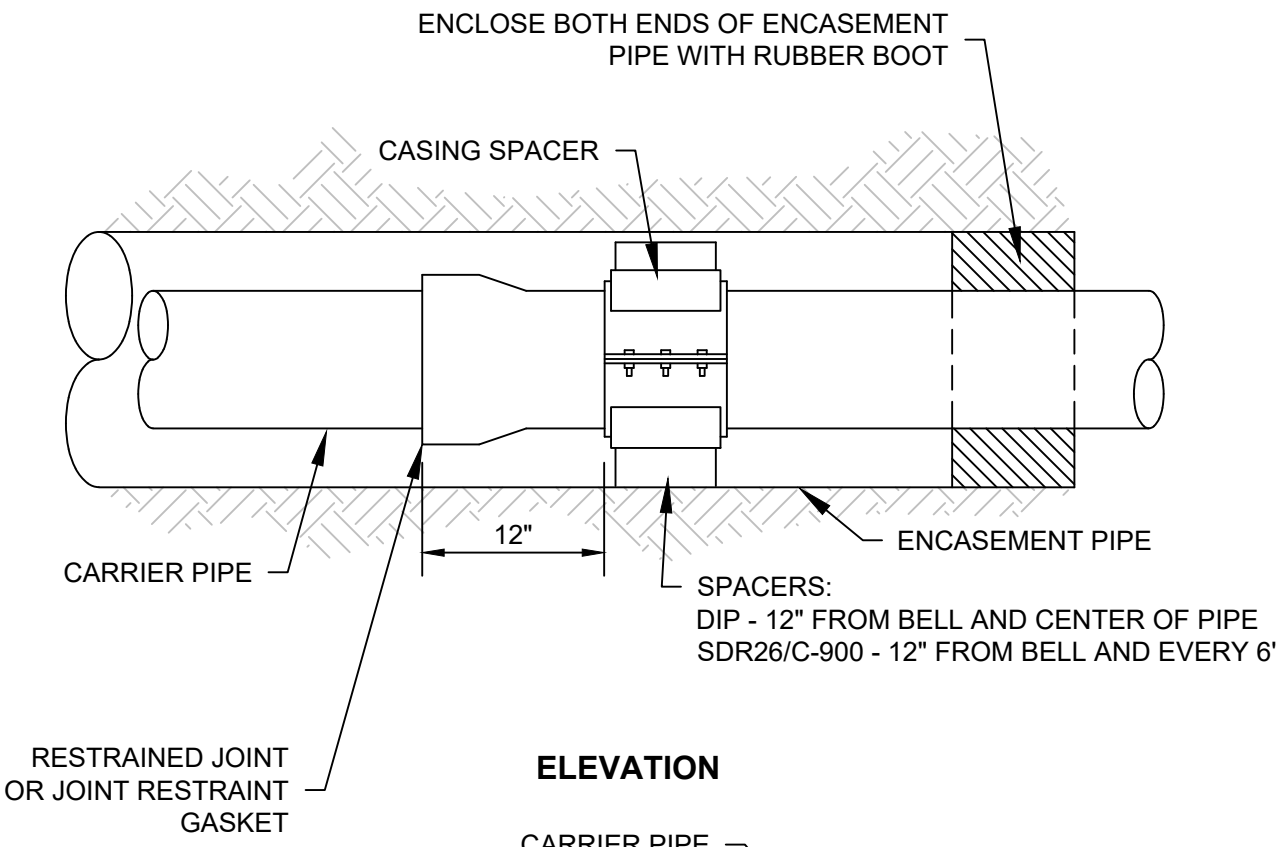
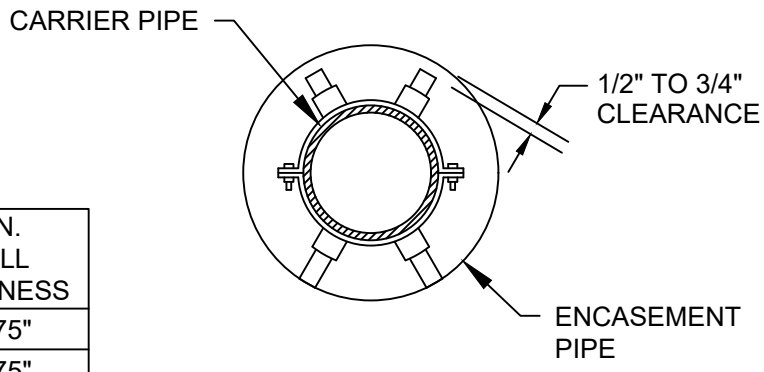


ELEVATION



SECTION

DIP CARRIER SIZE	MIN. STEEL CASING SIZE	MIN. WALL THICKNESS
4"	16"	0.375"
6"	18"	0.375"
8"	20"	0.375"
10"	22"	0.375"
12"	24"	0.375"
15"	27"	0.500"
16"	28"	0.500"
18"	30"	0.500"

N.T.S.

NOTES:
1. CASING TO EXTEND THE WIDTH OF THE ROAD R/W UNLESS OTHERWISE APPROVED BY METROCONNECTS.

ENCASEMENT PIPE

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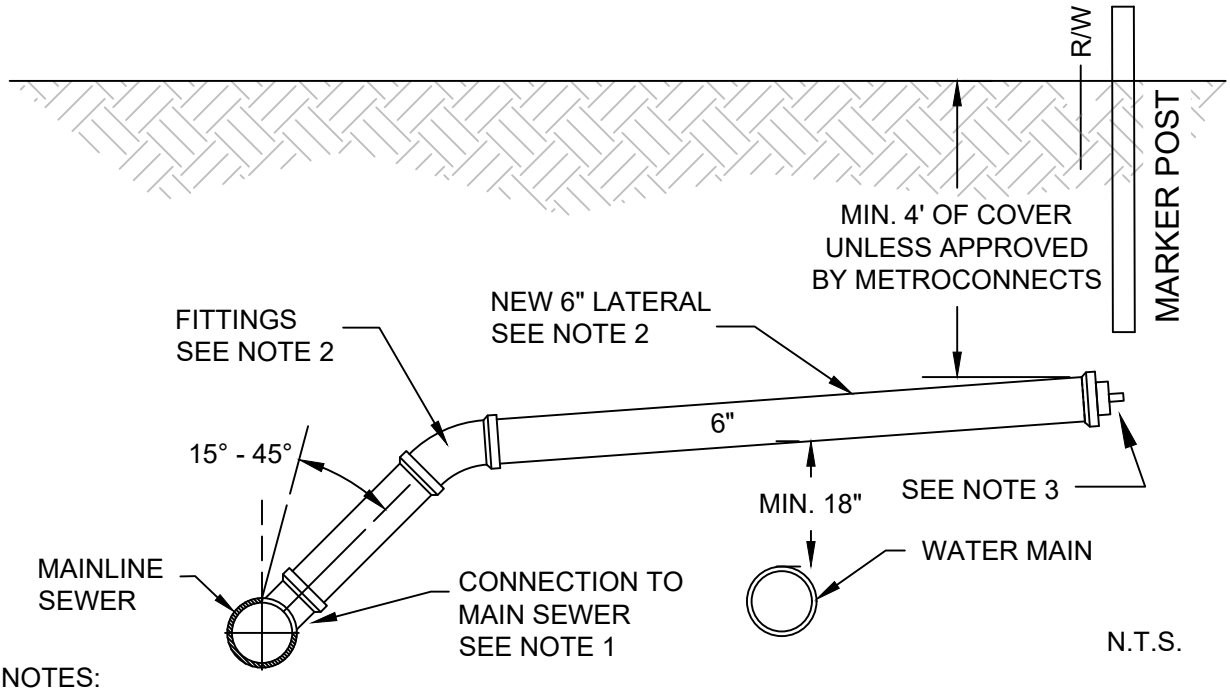

NOTES:

1. NEW SERVICE LATERALS SHALL BE CONNECTED TO THE SEWER MAIN BY INSTALLING A NEW D.I.P. OR PVC TEE WYE, OR CONNECTING TO THE EXISTING TEE WYE, AS SPECIFIED AND/OR DIRECTED BY METROCONNECTS.

2. ALL NEW LATERALS SHALL BE A MINIMUM OF 6". ONE FITTING AT MAIN AND ONE AT BEND AS SHOWN IN DETAIL. ALTERNATE CONFIGURATIONS WILL REQUIRE APPROVAL FROM METROCONNECTS BEFORE INSTALLATION. CONTRACTOR SHALL PROVIDE MIN 1% SLOPE. 90-DEGREE BENDS ARE NOT ALLOWED. LATERAL SHALL BE EMBEDDED PER EMBEDMENT DETAIL. SERVICE LATERAL PIPE AND FITTINGS SHALL BE SDR-26 PVC UNLESS D.I.P. IS REQUIRED.

   A MINIMUM OF 4' OF COVER SHALL BE MAINTAINED. ANY LATERAL WITH LESS THAN 4' OR MORE THAN 18' OF COVER OR CONNECTS TO A D.I.P. MAIN SHALL BE CONSTRUCTED WITH THICKNESS CLASS 50 OR PRESSURE CLASS 350 D.I.P PIPE.

   MINIMUM 18" VERTICAL SEPARATION (ABOVE OR BELOW) BETWEEN LATERALS AND WATER MAINS.

   ANY LATERALS INSTALLED LESS THAN 24" UNDER STORM DRAINAGE PIPE SHALL BE CONSTRUCTED WITH THICKNESS CLASS 50 OR PRESSURE CLASS 350 D.I.P. PIPE. A FULL LENGTH OF D.I.P. SHALL BE CENTERED UNDER THE STORM DRAINAGE PIPE.

3. CONTRACTOR SHALL EXTEND THE NEW 6" LATERAL TO THE EDGE OF THE PERMANENT SEWER R/W OR ROAD R/W. TEMPORARY PLUG MAY BE SDR 26 OR SDR 35 PVC.

4. THE CONNECTION TO A PRIVATE SERVICE LATERAL SHALL BE MADE BY INSTALLING A 6" CLEAN OUT, SEE DETAIL. THE CONNECTION SHALL BE WATERTIGHT.

5. ALL DIP PIPE AND FITTINGS SHALL HAVE 431 TNEMEC INTERIOR COATING.

SERVICE LATERAL

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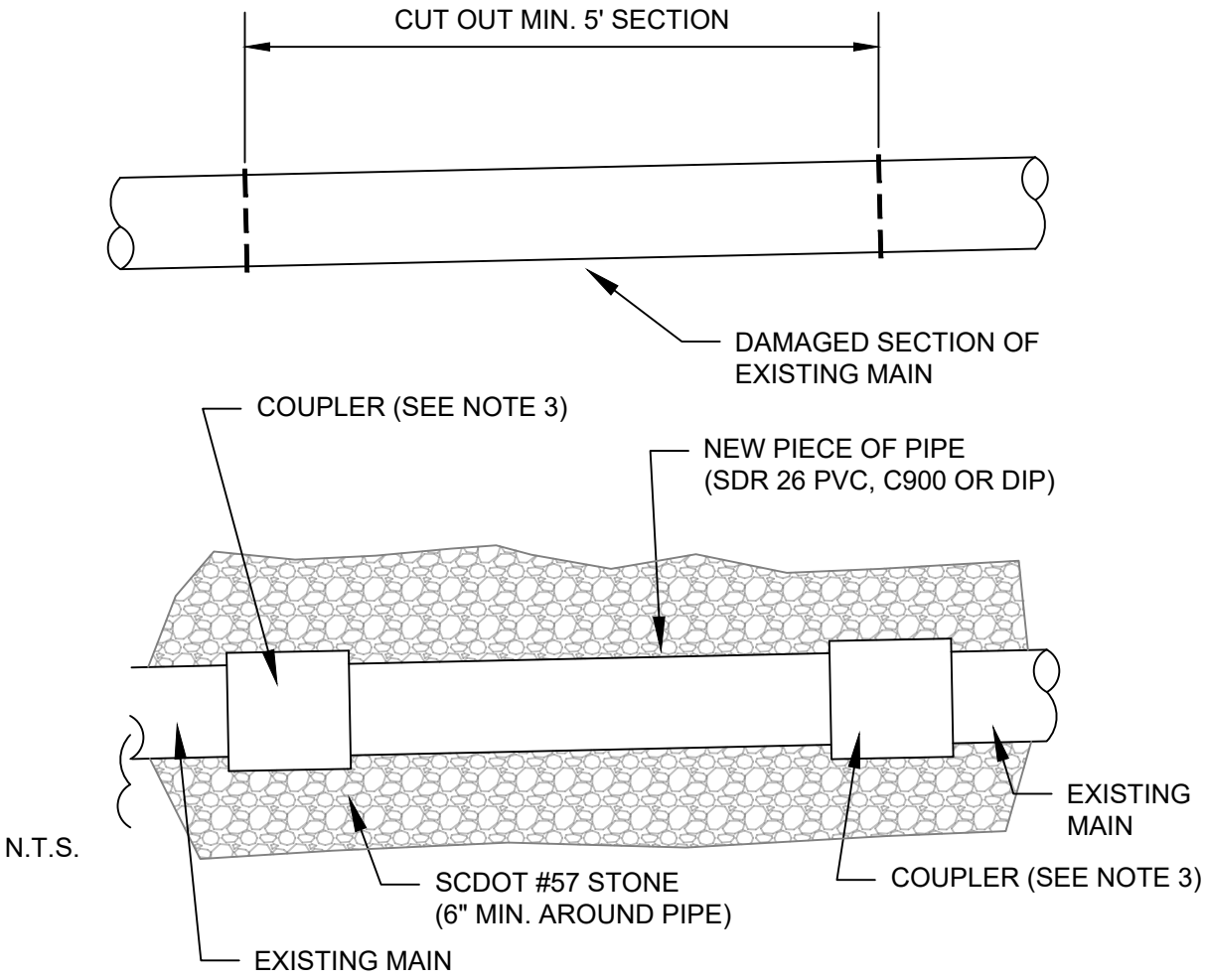

NOTES:

1. **ALL REPAIR SECTIONS MUST BE APPROVED BY METRO PRIOR TO INSTALLATION.**
2. REMOVE DAMAGED PORTION OF SEWER MAIN OR LATERAL (MIN 5').
3. INSTALL A NEW PIECE OF APPROPRIATE SIZE SDR 26 PVC, C900 OR DIP SEWER MAIN OR LATERAL, USE THE APPROPRIATE COUPLERS TO CONNECT EACH END.
   - 3.1. IF EXISTING MATERIAL IS SDR 35 OR 26 PVC - RIGID SDR 26 PVC SLIP COUPLERS ARE REQUIRED.
   - 3.2. IF EXISTING MAIN IS C900 - C900 SLIP COUPLERS ARE REQUIRED.
   - 3.3. IF EXISTING PIPE IS DIP - DIP SLIP COUPLERS ARE REQUIRED.
   - 3.4. IF EXISTING PIPE IS DIP TO NEW PVC - HARCO TRANSITION FITTINGS ARE REQUIRED.
     - MAXADAPTER OR HULK FITTINGS CAN BE USED WHEN SPACE DOES NOT ALLOW FOR TRANSITION FITTINGS.
   - 3.5. IF EXISTING PIPE IS VCP - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.6. IF EXISTING PIPE IS ULTRA RIB - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.7. IF EXISTING PIPE IS CONTECH A-2000 - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.8. IF EXISTING PIPE IS ASBESTOS CONCRETE - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
4. BED PIPE PER STANDARD DETAILS.

SEWER MAIN OR LATERAL REPAIR SECTION

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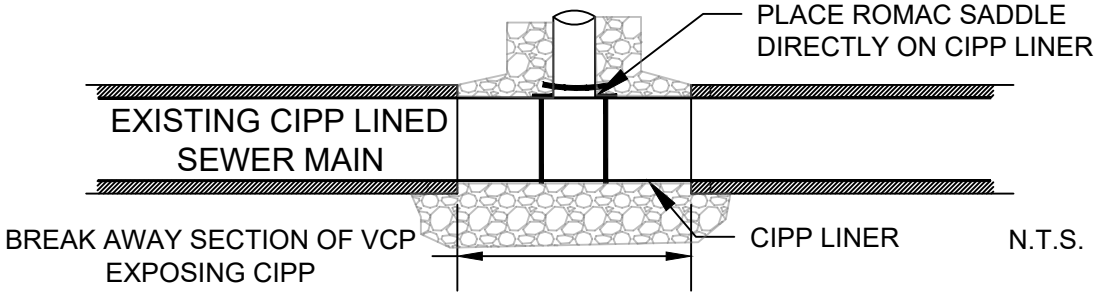

SADDLE CONNECTIONS TO NON LINED AND CIPP MAINS

NOTES:

1. **SADDLES MUST BE USED WHEN CONNECTING TO ANY MAIN WITH CIPP LINER, ALL OTHER USES WILL BE APPROVED ON A CASE BY CASE BASIS BY METROCONNECTS.**
2. STRAP-ON SADDLE SHALL BE A ROMAC "CB" SADDLE AS MANUFACTURED BY ROMAC INDUSTRIES, INC. OR APPROVED EQUAL. ANY APPROVED EQUAL SHALL BE SUBMITTED TO METRO FOR REVIEW AND APPROVAL. SADDLE SHALL BE PROVIDED FOR THE SPECIFIC TYPE OF LATERAL PIPE BEING INSTALLED.
3. FOR RECONNECTING EXISTING LATERALS, CAREFULLY REMOVE THE LATERAL TO LIMIT DAMAGE TO THE MAIN SEWER, INCREASE THE OPENING FOR A 6" LATERAL AS NECESSARY, INSTALL 6" STRAP-ON SADDLE, AND REPLACE LATERAL TO THE SPECIFIED LIMITS.
4. FOR NEW LATERAL CONNECTIONS, THE LATERAL SHALL CONNECT TO THE MAIN SEWER AT 45 DEGREES FROM HORIZONTAL TO THE LEFT OR RIGHT AS APPROPRIATE. USE A HOLE SAW TO NEATLY CUT THE SERVICE LATERAL OPENING. COUPON SHALL BE REMOVED AND SHOWN TO METRO INSPECTOR. INSTALL THE 6" STRAP-ON SADDLE AND INSTALL NEW 6" SDR 26 LATERAL TO THE SPECIFIED LIMITS.
5. SUPPORT THE EXISTING SEWER DURING THIS WORK AS NECESSARY.
6. MAIN SEWER SHALL BE INSPECTED VIA CLOSED CIRCUIT TELEVISION (CCTV) AFTER INSTALLATION OF LATERAL TO VERIFY THAT THE CONNECTION IS ACCEPTABLE TO METRO. DEFECTS SHALL BE REPAIRED BY THE CONTRACTOR.

SERVICE LATERAL SADDLE CONNECTION

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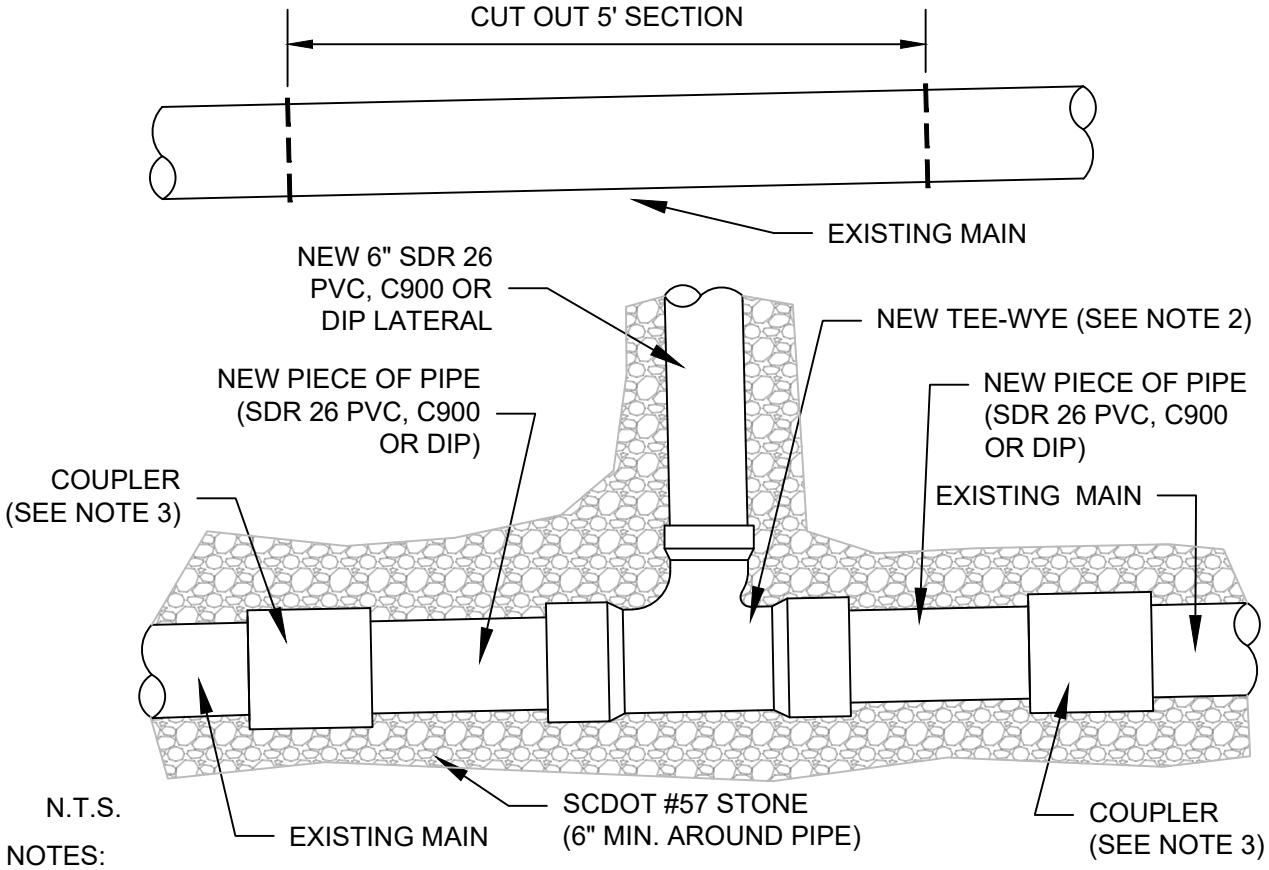

NOTES:

1. CAREFULLY REMOVE 5' SECTION OF EXISTING MAIN.
2. INSTALL APPROPRIATE SIZE TEE-WYE CENTERED BETWEEN NEW PIECES OF APPROPRIATE SIZE AND MATERIAL MAIN.
   - 2.1. IF EXISTING MAIN IS SDR 35 OR 26 - SDR 26 TEE-WYE REQUIRED.
   - 2.2. IF EXISTING MAIN IS C900 OR DIP - C900 OR DIP STANDARD TEE REQUIRED.
   - 2.3. IF EXISTING MAIN IS VCP - HEAVY WALL SDR 26 OR DIP TEE-WYE REQUIRED.
   - 2.4. IF EXISTING MAIN IS ULTRA-RIB - SDR 26 PVC TEE-WYE.
3. USE THE APPROPRIATE SLIP COUPLERS TO ATTACH TO EXISTING MAIN.
   - 3.1. IF EXISTING MAIN IS SDR 35 OR 26 PVC - RIGID SDR 26 SLIP COUPLERS ARE REQUIRED.
   - 3.2. IF EXISTING MAIN IS C900 - C900 SLIP COUPLERS ARE REQUIRED.
   - 3.3. IF EXISTING MAIN IS DIP - DIP SLIP COUPLERS ARE REQUIRED.
   - 3.4. IF EXISTING MAIN IS DIP TO NEW PVC - HARCO TRANSITION FITTINGS ARE REQUIRED. - MAXADAPTER OR HULK FITTINGS CAN BE USED WHEN SPACE DOES NOT ALLOW FOR TRANSITION FITTINGS.
   - 3.5. IF EXISTING MAIN IS VCP - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.6. IF EXISTING MAIN IS ULTRA RIB - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.7. IF EXISTING PIPE IS CONTECH A-2000 - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
   - 3.8. IF EXISTING MAIN IS ASBESTOS CONCRETE - MAXADAPTER OR HULK FITTINGS ARE REQUIRED.
4. INSTALL 6" SDR 26 PVC, C900 OR DIP LATERAL TO EDGE OF PERMANENT SEWER R/W OR ROAD R/W.
5. INSTALL 6" PVC CLEAN OUT PER DETAIL SS-6.5
6. BED PIPE PER STANDARD DETAILS.

SERVICE LATERAL TO EXISTING SEWER MAIN

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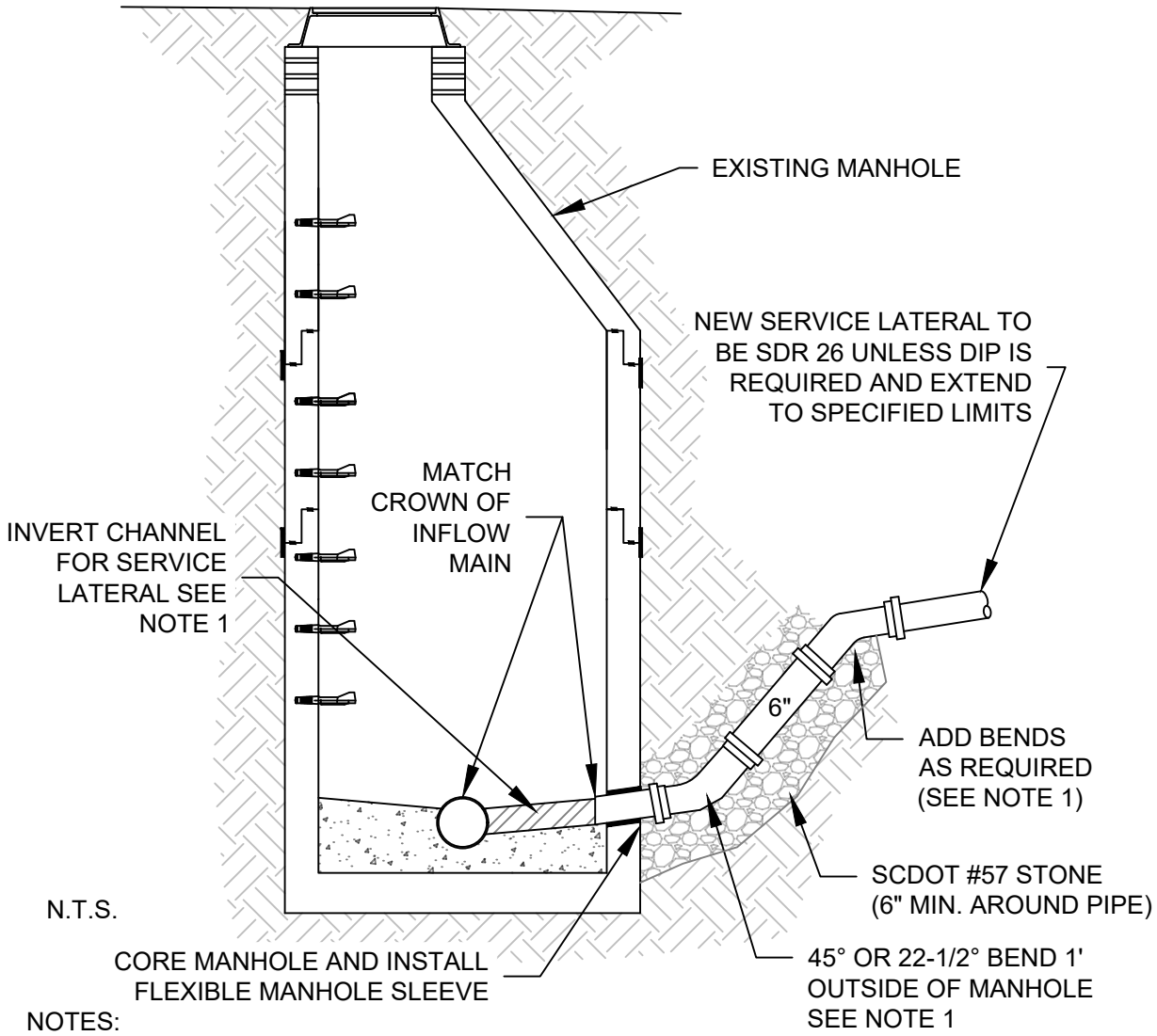
SS-6.3



NOTES:

1. SERVICE LATERALS SHALL BE INSTALLED SO THAT THE CROWN OF THE NEW LATERAL MATCHES CROWN OF INFLOW MAIN. ALTERNATE CONFIGURATIONS TO THE LATERAL BENDS AS SHOWN ABOVE, WILL REQUIRE APPROVAL FROM METROCONNECTS BEFORE INSTALLATION. THE WIDTH OF THE CHANNEL SHALL BE EQUAL TO SERVICE LATERAL DIAMETER. THE HEIGHT OF THE CHANNEL SHALL BE 0.8 OF THE PIPE DIAMETER. PROVIDE A SWEEP IN THE NEW CHANNEL FOR A SMOOTH TRANSITION TO THE MAIN INVERT CHANNEL. THE CHANNEL SHALL BE UNIFORM, FREE OF BURRS, AND CONSTANTLY SLOPING FROM THE INLET CONNECTION TO THE MAIN INVERT CHANNEL.

2. PROVIDE A WATERTIGHT SEAL AT THE PIPE CONNECTION BY CORING THE MANHOLE AND INSTALLING AN APPROVED BOOT CONNECTION.

3. IF MANHOLE IS DEEPER THAN 10', VERIFY WITH METRO IF AN INSIDE DROP COULD BE USED. (SEE DETAIL SS-7.7)

SERVICE LATERAL TO MANHOLE

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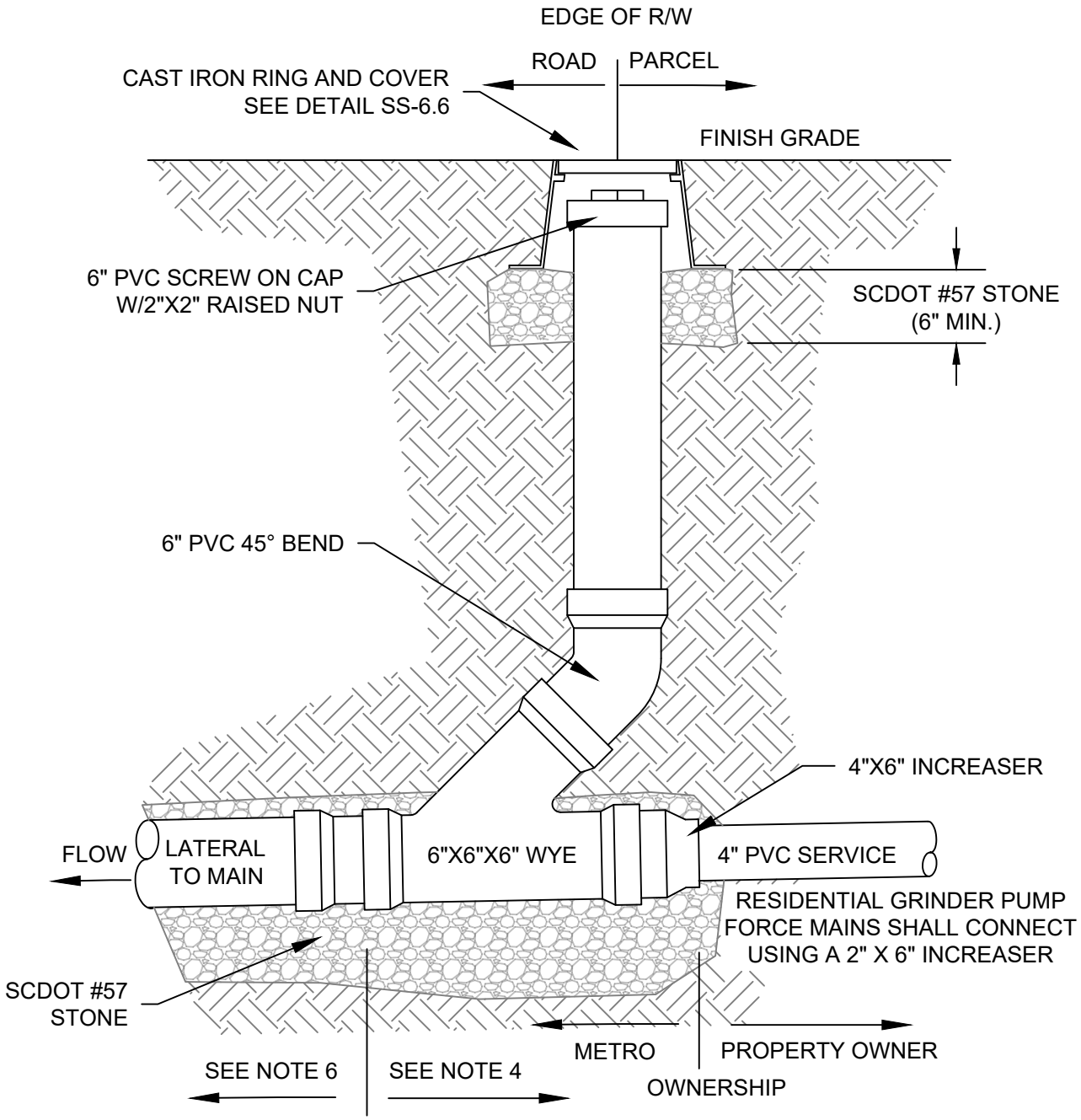
SS-6.4



N.T.S.

NOTES:

1. FOR COMMERCIAL PROPERTIES USE 6" PVC SERVICE FROM BUILDING.
2. CLEANOUTS REQUIRED ON ALL NEW SERVICE CONNECTIONS.
3. ALL LATERALS AND SERVICE LINES TO HAVE A MIN. 1% SLOPE TO SEWER MAIN.
4. ALL SCH 40 PVC IS TO BE DWV PIPE (SOLID CORE ONLY). SDR 26 GASKETED PIPE AND FITTINGS MAY BE USED INSTEAD OF SCH 40 DWV.
6. SEE SS-6.5 SHEET 2 OF 2 FOR EXISTING LATERAL CONNECTION.

SANITARY SEWER SERVICE CLEAN OUT

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SS-6.5
SHEET 1 OF 2
Review Date: January 28, 2026

CONNECTION TO EXISTING LATERALS:

1. USING SCH 40 DWV PIPE AND FITTINGS FOR CLEAN OUT

   1.1. IF EXISTING LATERAL IS SDR 35 OR 26 PVC - A RIGID SDR 26 PVC TO SCH 40 DWV SOLVENT WELD ADAPTER IS REQUIRED.
   1.2. IF EXISTING LATERAL IS DIP - SCH 40 IS NOT ALLOWED.
   1.3. IF EXISTING LATERAL IS VCP - A MAXADAPTER OR HULK FITTING IS REQUIRED.
   1.4. IF EXISTING LATERAL IS ULTRA RIB - SEE DETAIL SS-6.3.
   1.5. IF EXISTING LATERAL IS CONTECH A-2000 - A MAXADAPTER OR HULK FITTING IS REQUIRED.

2. USING SDR 26 GASKETED PIPE AND FITTINGS FOR CLEAN OUT

   2.1. IF EXISTING LATERAL IS SDR 35 OR 26 PVC - NO ADAPTER IS REQUIRED.
   2.2. IF EXISTING LATERAL IS DIP - A 6" SDR 26 TO 6" DIP ADAPTER IS REQUIRED.
   2.3. IF EXISTING LATERAL IS VCP - A MAXADAPTER OR HULK FITTING IS REQUIRED.
   2.4. IF EXISTING LATERAL IS ULTRA RIB - A MAXADAPTER OR HULK FITTING IS REQUIRED.
   2.5. IF EXISTING LATERAL IS CONTECH A-2000 - A MAXADAPTER OR HULK FITTING IS REQUIRED.

SANITARY SEWER SERVICE CLEAN OUT

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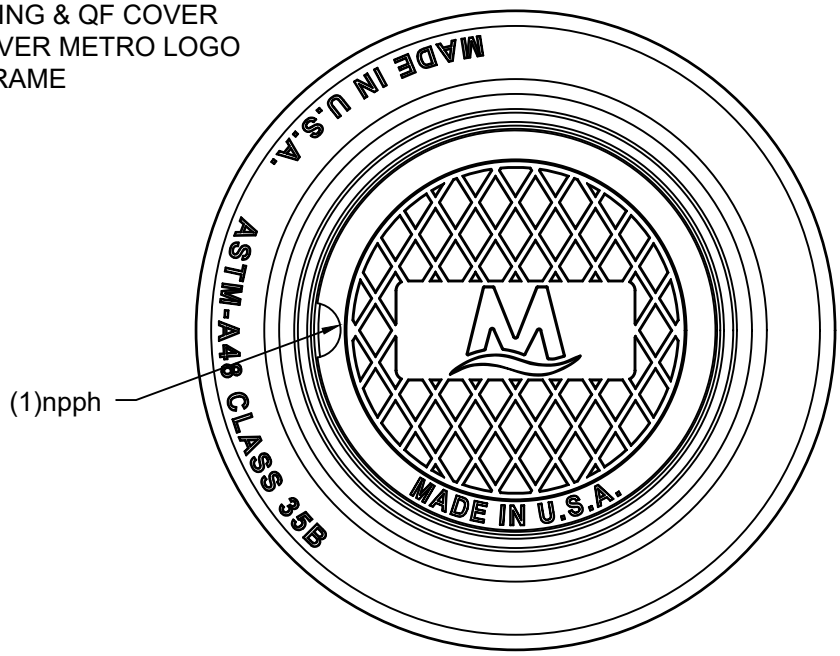
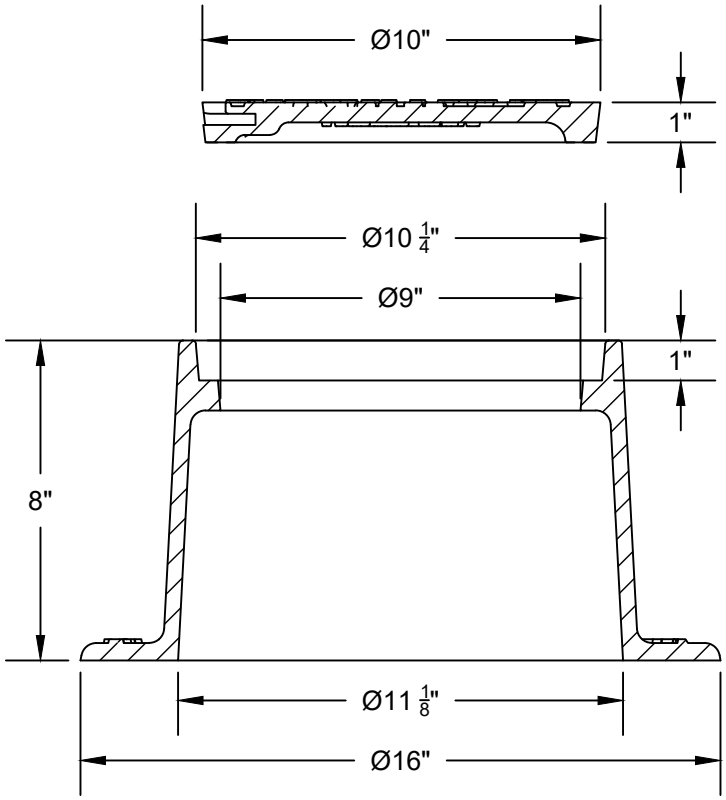
SS-6.5
SHEET 2 OF 2
Review Date: January 28, 2026

USF 7631 RING & QF COVER
EJ 1566 COVER METRO LOGO
1566Z FRAME





N.T.S.

STANDARD CLEAN OUT RING AND COVER

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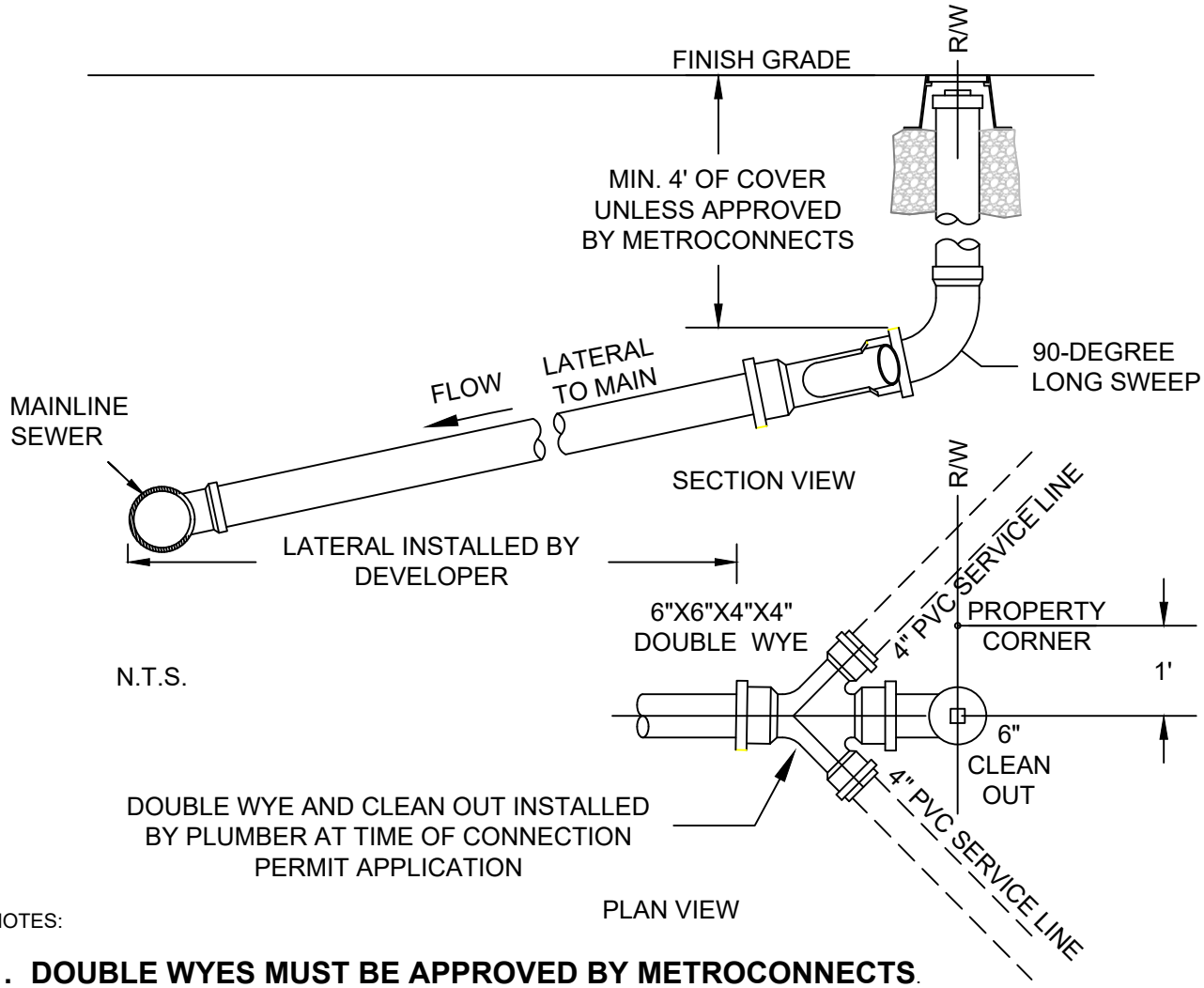
Review Date: January 28, 2026



NOTES:

1. **DOUBLE WYES MUST BE APPROVED BY METROCONNECTS**.
2. NEW SDR 26 PVC SERVICE LATERALS SHALL BE CONNECTED TO THE SEWER MAIN BY A D.I.P. OR PVC TEE WYE. ALL C900 OR D.I.P. LATERALS SHALL BE CONNECTED TO MAIN BY C900 OR D.I.P. TEE.
3. ALL NEW LATERALS SHALL BE A MINIMUM OF 6". CONTRACTOR SHALL MINIMIZE BENDS AND FITTINGS. CONTRACTOR SHALL PROVIDE MIN 1% SLOPE. 90-DEGREE BENDS ARE NOT ALLOWED ON THE LATERAL. LATERAL SHALL BE EMBEDDED PER EMBEDMENT DETAIL. SERVICE LATERAL PIPE AND FITTINGS SHALL BE SDR-26 PVC UNLESS C900 OR D.I.P. IS REQUIRED.
4. A MINIMUM OF 4' OF COVER SHALL BE MAINTAINED. ANY LATERAL WITH LESS THAN 4' OF COVER SHALL BE CONSTRUCTED WITH C900 OR D.I.P PIPE. ALL LATERALS WITH LESS THAN 3' OF COVER REQUIRE METROCONNECTS APPROVAL.
5. ANY LATERALS INSTALLED LESS THAN 24" UNDER STORM DRAINAGE PIPE SHALL BE CONSTRUCTED WITH C900 OR D.I.P. PIPE. A FULL LENGTH OF PIPE. SHALL BE CENTERED UNDER THE STORM DRAINAGE PIPE.
6. CONTRACTOR SHALL EXTEND THE NEW 6" LATERAL TO THE EDGE OF THE PERMANENT SEWER R/W OR ROAD R/W. TEMPORARY 4" PLUGS MAY BE SDR 26 OR SDR 35 PVC.
7. CONTRACTOR SHALL INSTALL A 6" CLEAN OUT, PER DETAIL. THE CONNECTION SHALL BE WATERTIGHT.
8. ALL D.I.P. PIPE AND FITTINGS SHALL HAVE TNEMEC 431 INTERIOR COATING.

DOUBLE WYE SERVICE LATERAL

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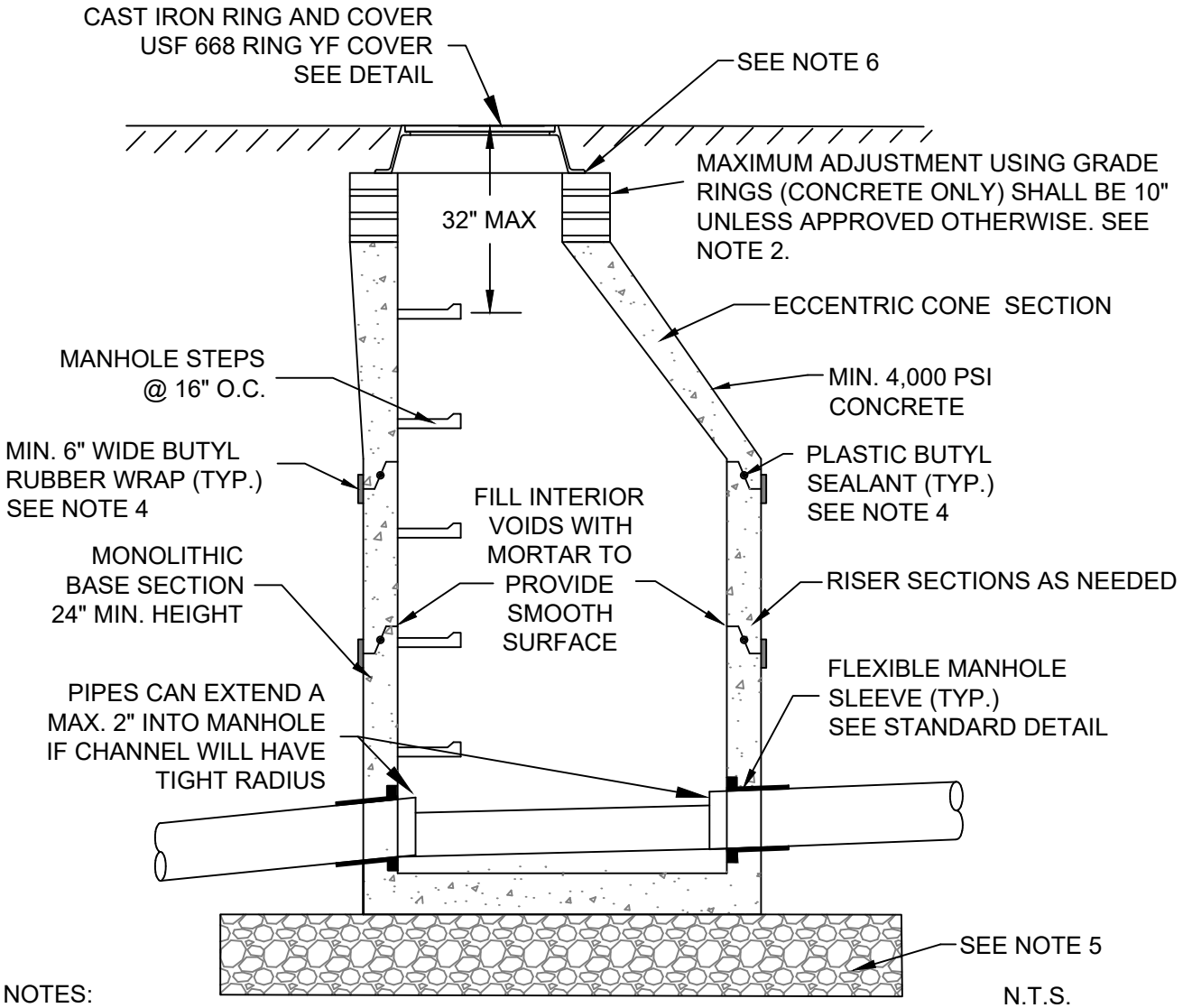

N.T.S.

NOTES:

1. MINIMUM INSIDE DIAMETER SHALL BE 4'. MANHOLES 12' - 17.9 ' IN DEPTH SHALL HAVE A MINIMUM INSIDE DIAMETER OF 5'. MANHOLES 18' IN DEPTH AND GREATER SHALL HAVE A MINIMUM INSIDE DIAMETER OF 6'. MANHOLES SHALL BE NO GREATER THAN 23' IN DEPTH. WALL THICKNESS SHALL BE 1/12TH OF THE INSIDE DIAMETER WITH A MINIMUM THICKNESS OF FIVE (5") INCHES.
2. MANHOLE SHALL BE ORDERED WITH MINIMUM GRADE ADJUSTMENT. ORDER BASE, RISER AND CONE HEIGHTS TO STACK OUT MANHOLE AS CLOSE AS POSSIBLE TO GRADE. MAXIMUM ADJUSTMENT SHALL BE 32 INCHES FROM TOP OF RIM TO TOP STEP UNLESS APPROVED OTHERWISE.
3. SEE DETAIL FOR RIM ELEVATION IN LAWN AREAS AND IN OUTFALL AREAS.
4. PLASTIC BUTYL SEALANT AND EXTERNAL WRAP TO BE USED AT ALL SECTION JOINTS.
5. MIN. 12" FOUNDATION MATERIAL, EXTEND 12" BEYOND OUTSIDE WALL OF MANHOLE.
6. ATTACH MANHOLE RING TO CONE WITH 2 RINGS OF BUTYL TAPE. (SEE DETAIL)
7. MANHOLES TO BE ORDERED WITH FLEXIBLE SLEEVES INSTALLED UNLESS APPROVED BY METROCONNECTS.
8. MANHOLES WILL BE PLACED ON COMPACTED SOIL MEETING NOTE 6 OF DETAL 1.1.

STANDARD PRECAST MANHOLE

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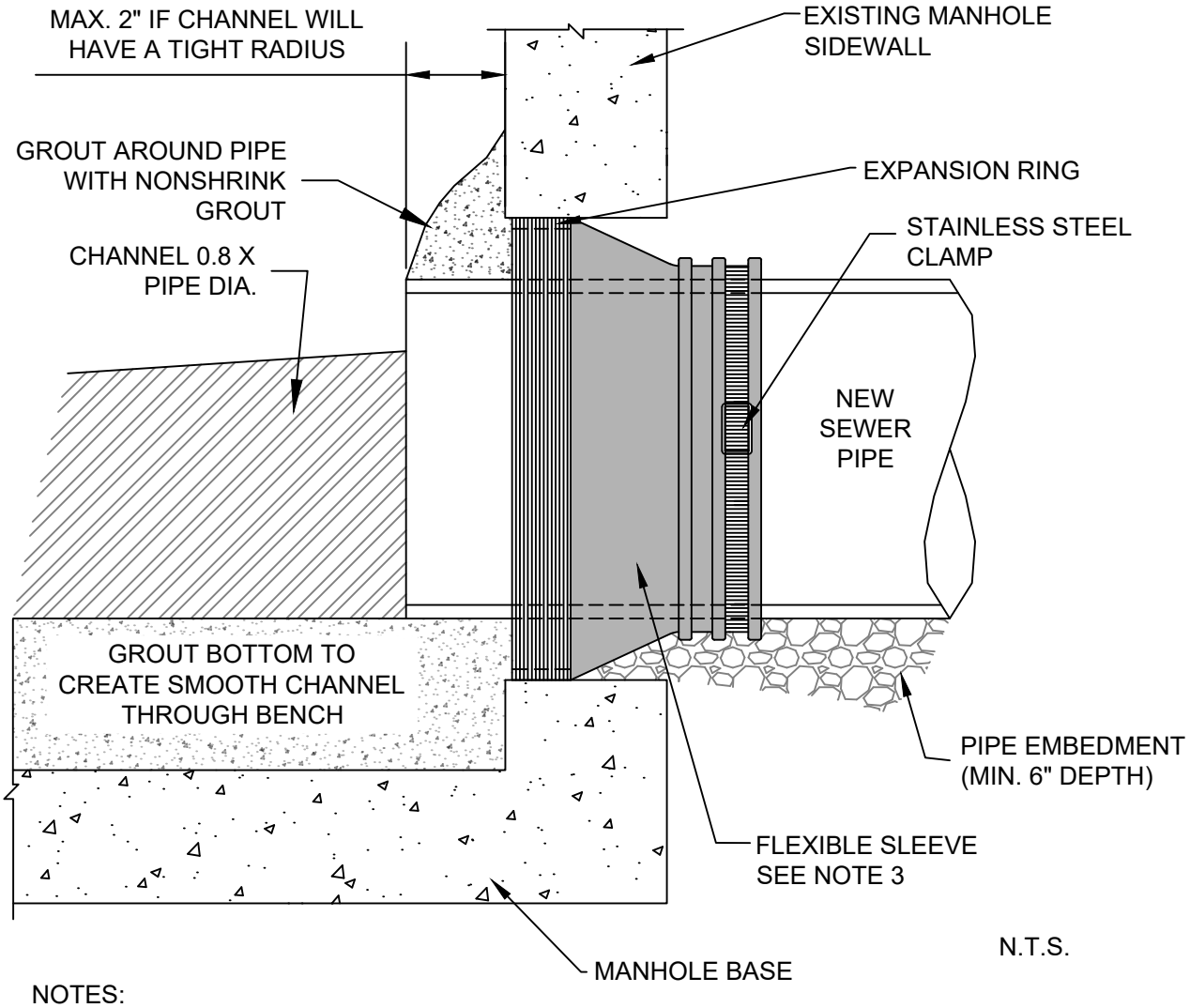
WHEN REPLACING A SERVICE OR MAIN LINE, BREAK OUT EXISTING PIPE AND EXISTING GROUT. CONTRACTOR SHALL CORE DRILL NEW OPENING AS NECESSARY. OPENING DIAMETER PER MANUFACTURER'S RECOMMENDATION.



N.T.S.

NOTES:

1. THIS DETAIL APPLIES WHENEVER A NEW SERVICE LATERAL OR SEWER MAIN CONNECTS TO AN EXISTING METROCONNECTS MANHOLE.
2. NEW SERVICE LATERALS SHALL TERMINATE IN MANHOLE A MAX OF 2" IF CHANNEL WILL HAVE A TIGHT RADIUS.
3. FLEXIBLE MANHOLE SLEEVES SHALL CONFORM TO ASTM C923. SLEEVES BY PRESS-SEAL GASKET CORPORATION OR TRELLEBORG OR EQUIVALENT ARE ACCEPTABLE. MAXIMUM DEFLECTION FOR SLEEVE IS 7° (12%). SLOPES GREATER THAN 12% MUST HAVE SLEEVES DESIGNED FOR HIGHER DEFLECTION.
4. ALL NEW CONNECTIONS TO EXISTING MANHOLES WILL MATCH CROWN OF INFLOW MAIN.

FLEXIBLE MANHOLE BOOT

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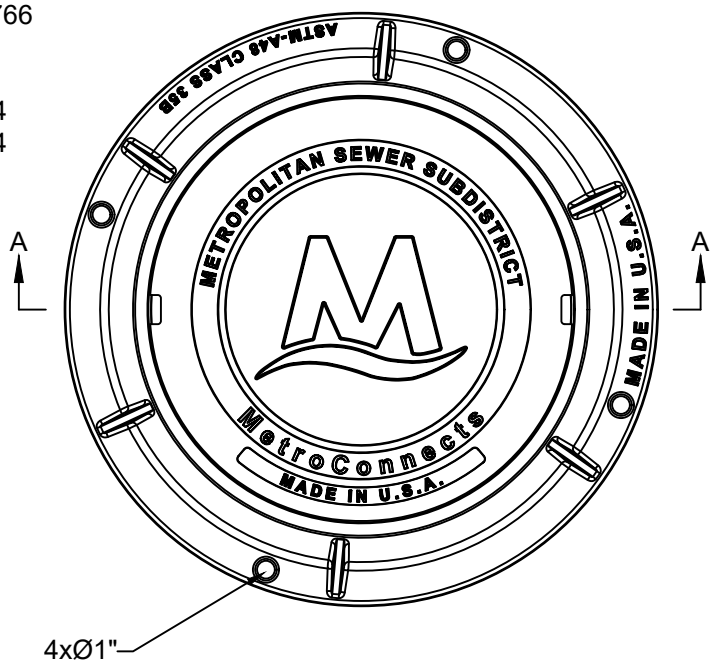
SS-7.1

USF 668 RING & YF COVER

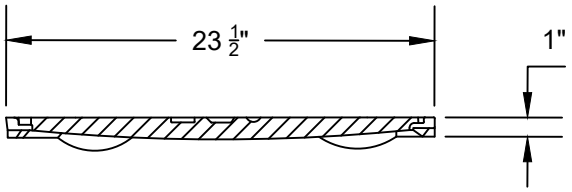
RING	8021558
COVER	8018766

EJ

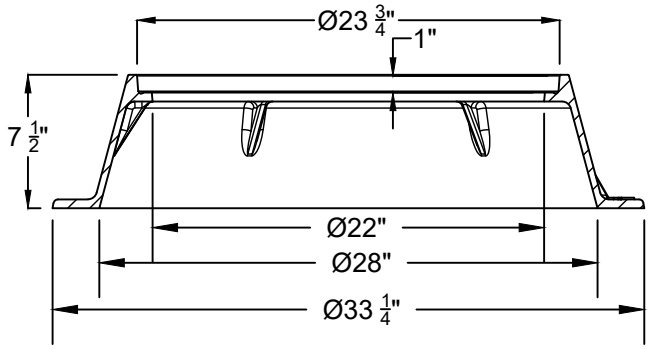
RING	V1384
COVER	V1384



PLAN VIEW



SECTION A - COVER



SECTION A - RING

N.T.S.

STANDARD MANHOLE RING AND COVER

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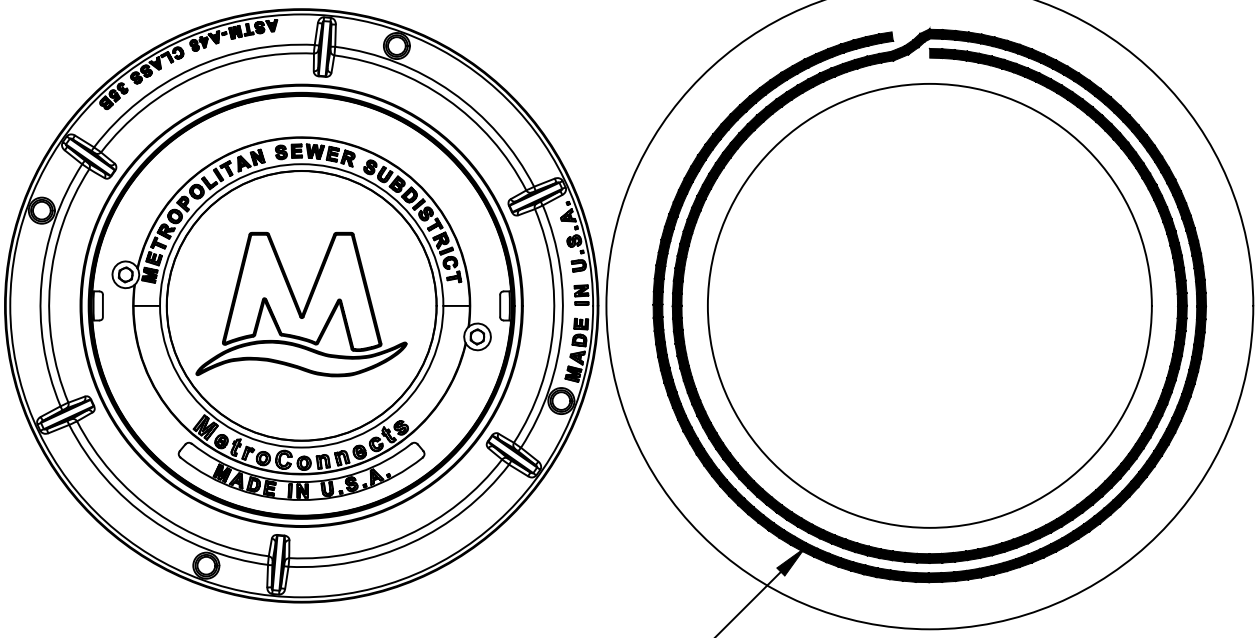
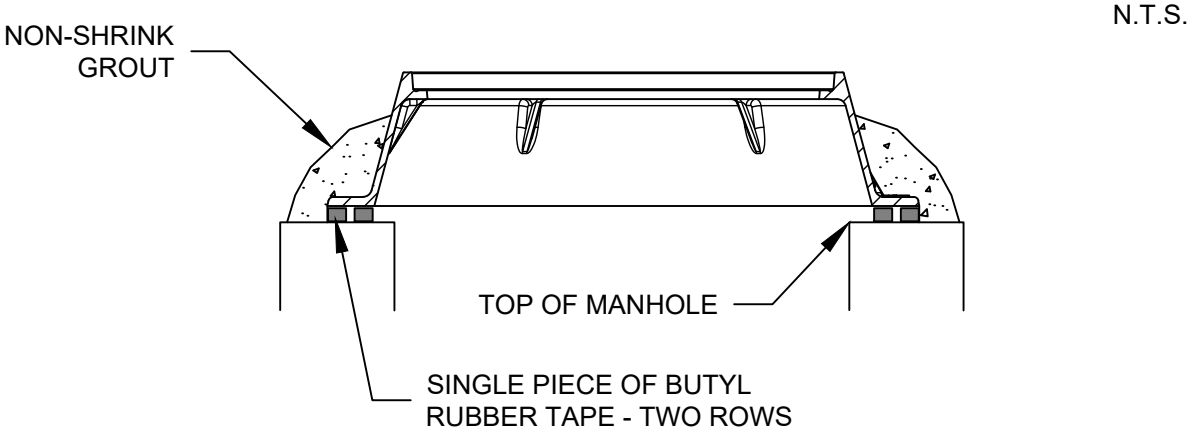


PLAN VIEW

N.T.S.



SECTION A - RING

NOTES:
1. REMOVE ANY DEBRIS FROM TOP OF CONE AND BOTTOM OF RING.
2. PLACE A SINGLE PIECE OF BUTYL RUBBER TAPE AROUND TOP OF CONE CREATING 2 ROWS. SEE DETAIL ABOVE.
3. PLACE MANHOLE RING IN PLACE OVER TAPE AND APPLY PRESSURE.
4. USING NON-SHRINK GROUT, GROUT AROUND OUTSIDE OF RING.

MANHOLE RING SEAL

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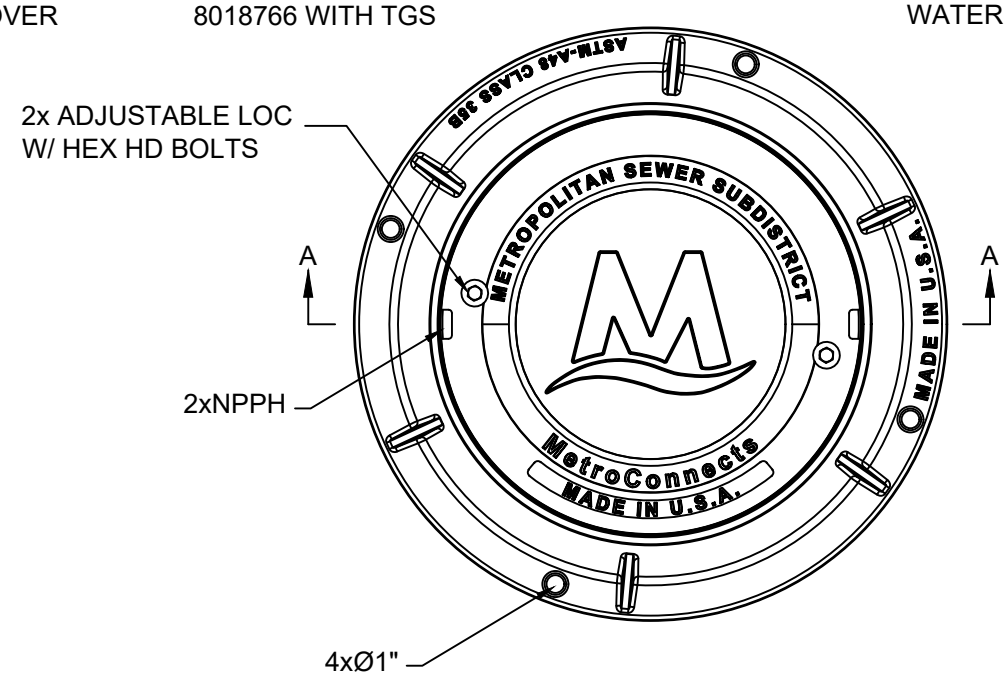
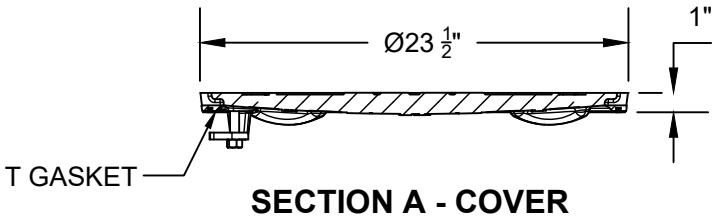
USF 668 RING & YF COVER

RING	8021558
COVER	8018766 WITH TGS

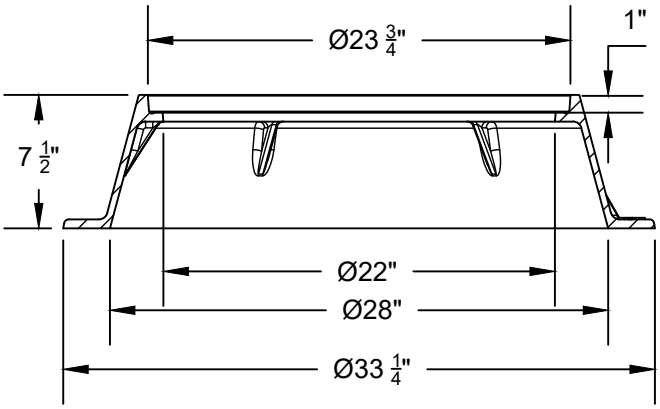
EJ
V1384 ASSEMBLY
WATER TIGHT



PLAN VIEW



SECTION A - COVER



SECTION A - RING

N.T.S.

WATERTIGHT MANHOLE RING AND COVER

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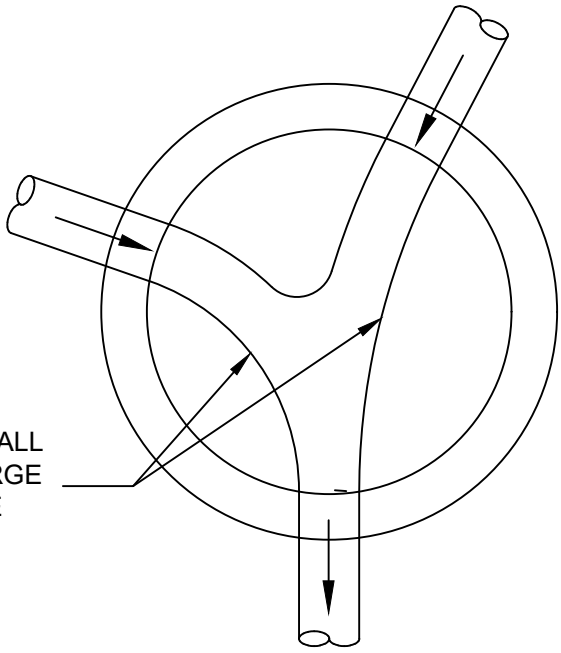
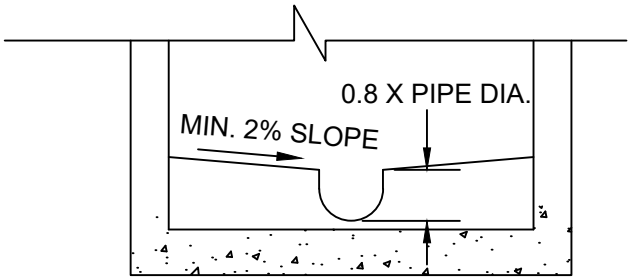


RADIUS OF CHANNELS SHALL BE CONSTRUCTED AS LARGE AS THE DIAMETER OF THE MANHOLE WILL ALLOW

PLAN



SECTION - INVERT

N.T.S.

MANHOLE BENCH AND CHANNELS

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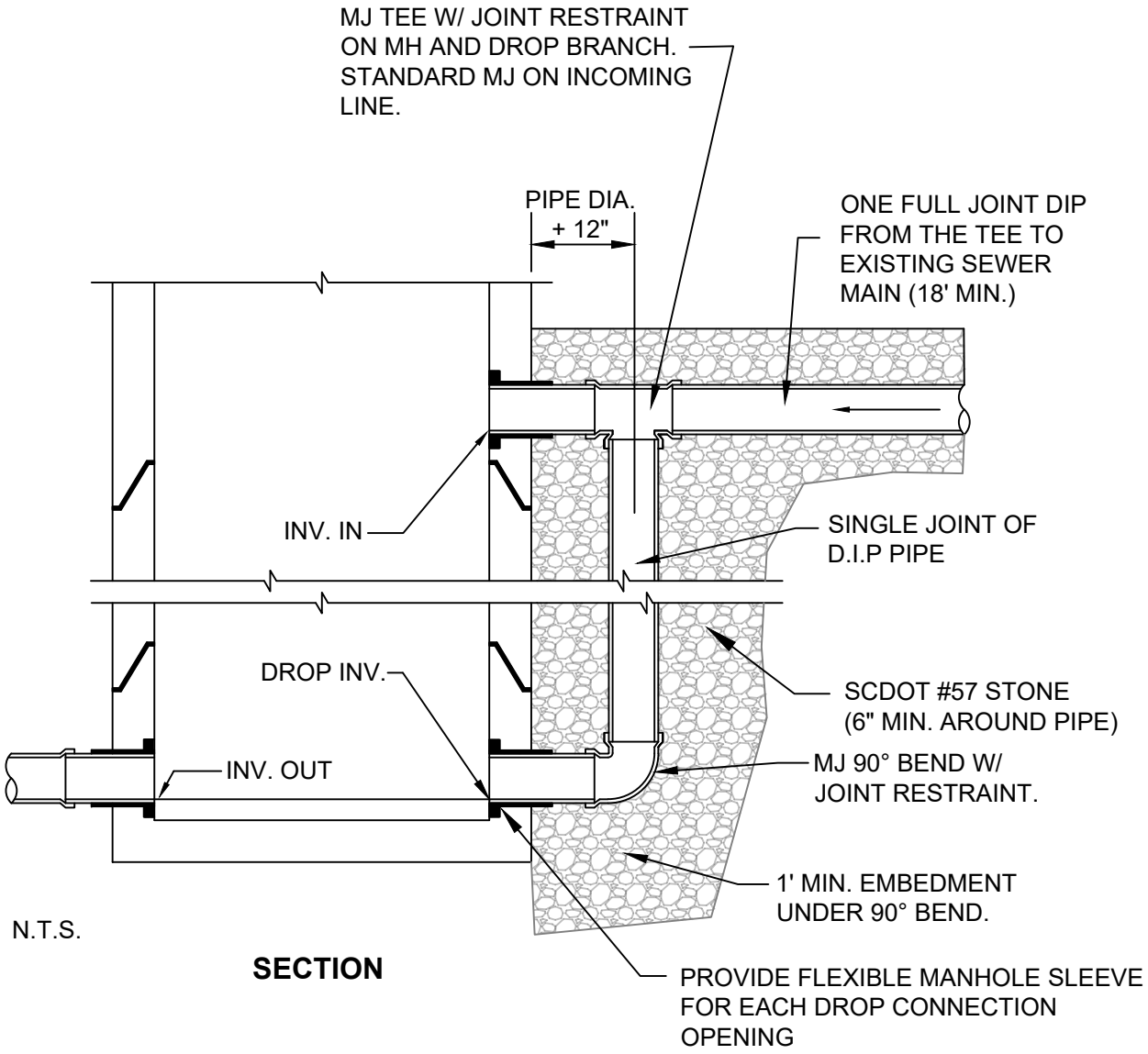

N.T.S.

SECTION

NOTES:

1. **OUTSIDE DROPS TO BE APPROVED BY METROCONNECTS ON A CASE BY CASE BASIS.**
2. ALL PIPE AND FITTINGS SHALL BE D.I.P. WITH TNEMEC 431 INTERIOR COATING.
3. MINIMUM DROP (INVERT IN - DROP INVERT) SHALL BE 5 FEET. MAXIMUM DROP SHALL BE 20 FEET.
4. JOINT RESTRAINT SHALL BE MEGALUG RETAINER GLANDS BY EBAA IRON SALES, INC. OR APPROVED EQUAL

OUTSIDE DROP CONNECTION

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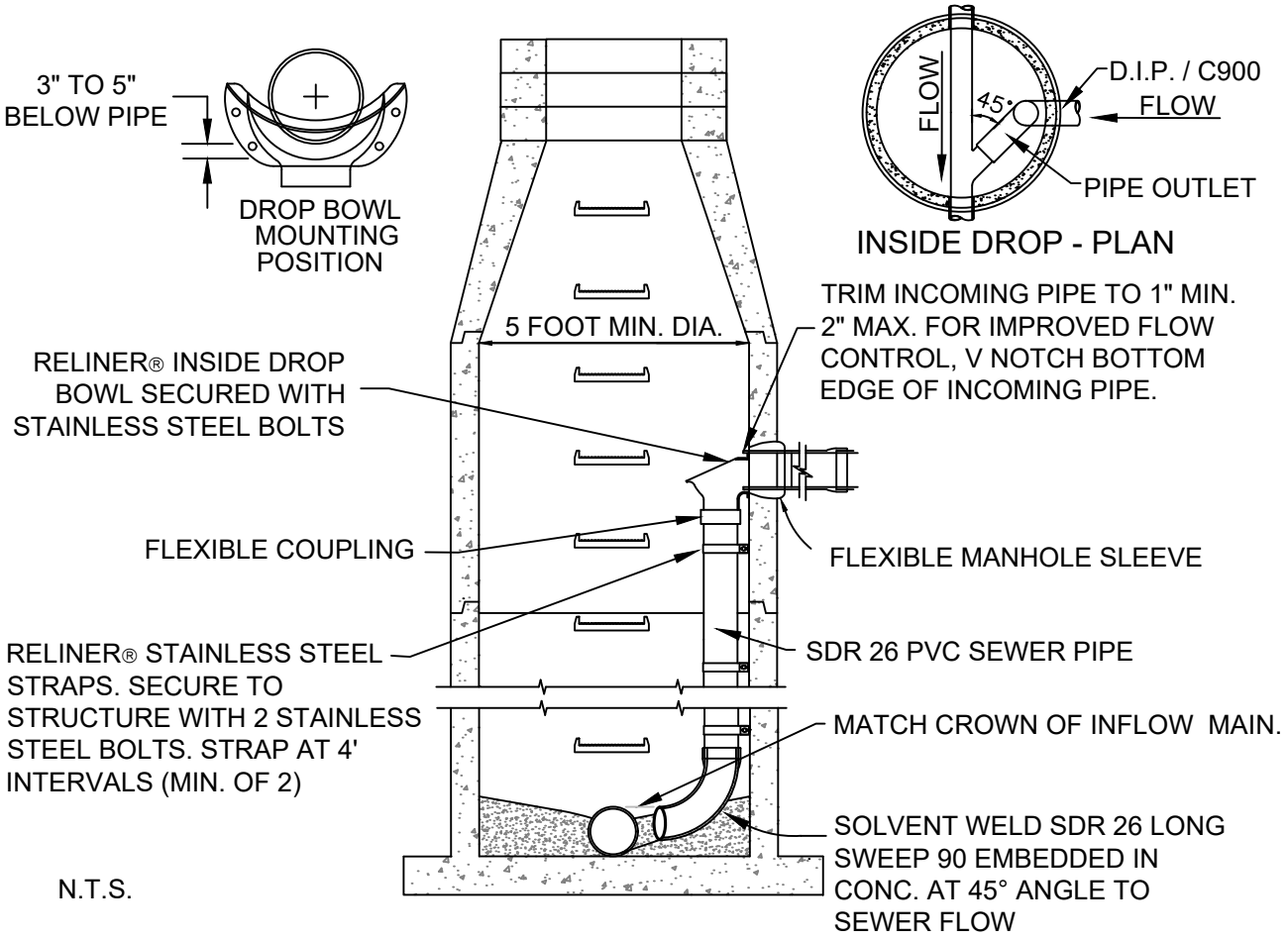

NOTES:

1. MINIMUM DROP (INVERT IN - DROP INVERT) SHALL BE 5'. MAXIMUM DROP SHALL BE 20'
2. LOCATION OF STEPS SHALL NOT CONFLICT WITH DROP CONNECTION (90° FROM DROP PIPE).
3. PROVIDE CHANNEL WITH CONTINUOUS INVERT FROM DROP CONNECTION TO INVERT OF SEWER MAIN.
4. SEE DETAIL OF STANDARD PRECAST CONCRETE MANHOLE FOR ADDITIONAL DETAILS AND REQUIREMENTS.
5. A RELINER® FORCE LINE HOOD IS REQUIRED IF SLOPE OF SEWER MAIN IS GREATER THAN 5% OR DIRECTED BY METRO PER CONSTRUCTION PLANS.
6. ALL INSIDE DROP CONNECTIONS FOR SERVICES AND COLLECTOR SEWERS SHALL USE THE DROP BOWL, OR APPROVED EQUAL AS PRODUCED BY: RELINER-DURAN, INC. 53 MT. ARCHER RD, LYME, CT 06371
7. SECURE DROP PIPE TO MANHOLE WALL WITH RELINER-DURAN, INC STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS, OR APPROVED EQUAL.
8. MAX HEIGHT OF SLIDE SHALL BE 18".

INSIDE DROP CONNECTION

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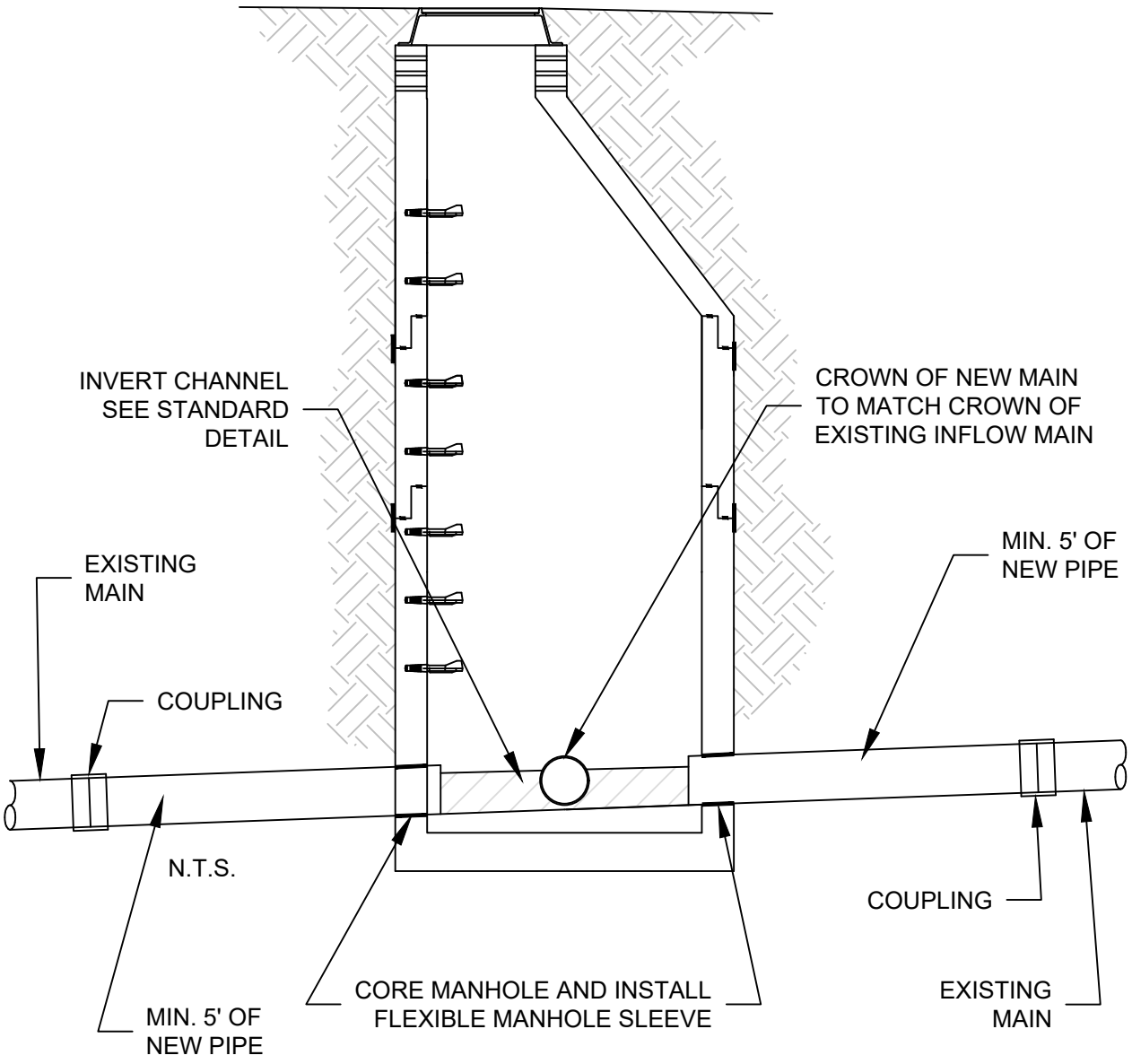

NOTES:

1. THIS DETAIL DEPICTS RECONNECTING ONE PIPE TO A NEW MANHOLE. ALL INCOMING PIPES AND THE OUTGOING PIPE SHALL BE RECONNECTED PER THIS DETAIL - EACH SEWER SHALL BE RECONNECTED WITH MIN 5 FEET OF NEW PIPE.
2. CONSTRUCT MANHOLE PER STANDARD PRECAST MANHOLE DETAIL.
3. BED ALL PIPE PER SPECIFICATIONS.
4. SEE DETAIL SS-6.1 FOR TYPE OF COUPLER TO CONNECT TO EXISTING MAIN.
5. ALL NEW PIPE WILL BE SDR 26 PVC UNLESS CONNECTING TO DIP OR C900.

MANHOLE ON EXISTING SEWER

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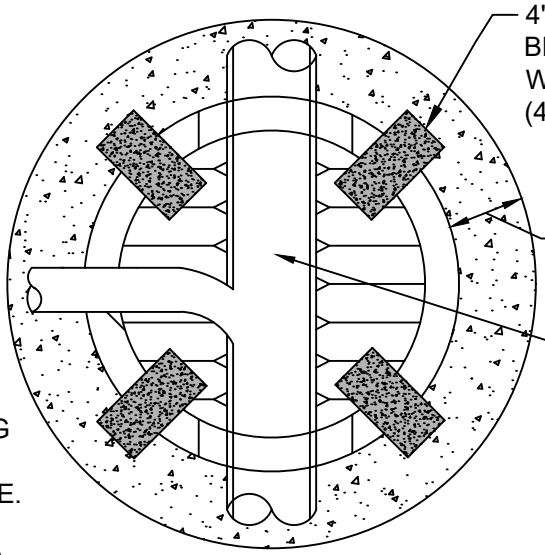
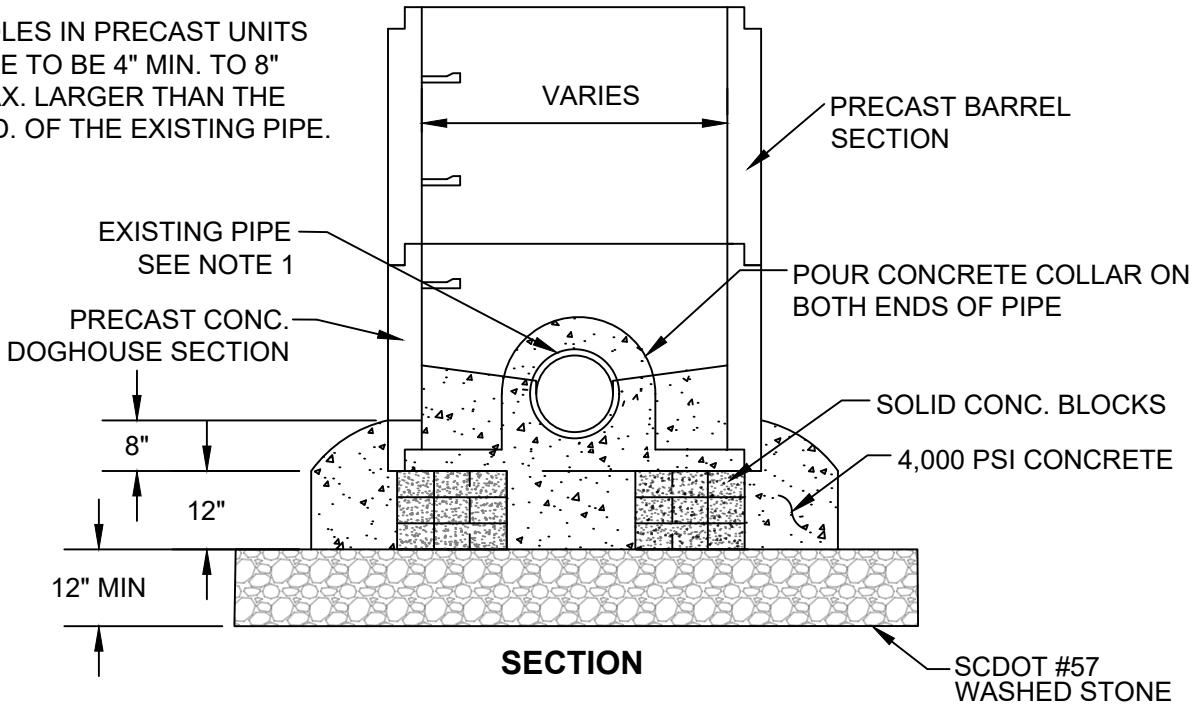


PLAN

NOTES:

1. FILL DOGHOUSE OPENING AROUND EXISTING PIPE WITH 4,000 PSI CONCRETE.
2. ALLOW CONC. TO FLOW A MIN. 12" BEYOND BASE OF STRUCTURE.
3. MANHOLE TO BE BUILT IN ACCORDANCE WITH STANDARD DETAILS FOR 4' AND/OR 5' MANHOLES.
4. HOLES IN PRECAST UNITS ARE TO BE 4" MIN. TO 8" MAX. LARGER THAN THE O.D. OF THE EXISTING PIPE.

N.T.S.



SECTION

ALL DOGHOUSE MANHOLES MUST BE APPROVED BY METROCONNECTS

DOGHOUSE MANHOLE

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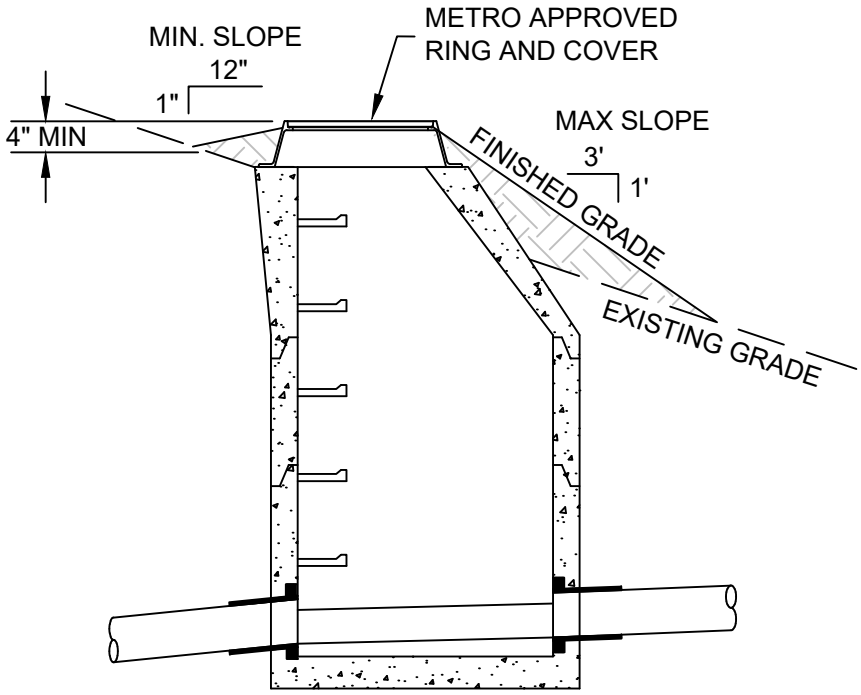
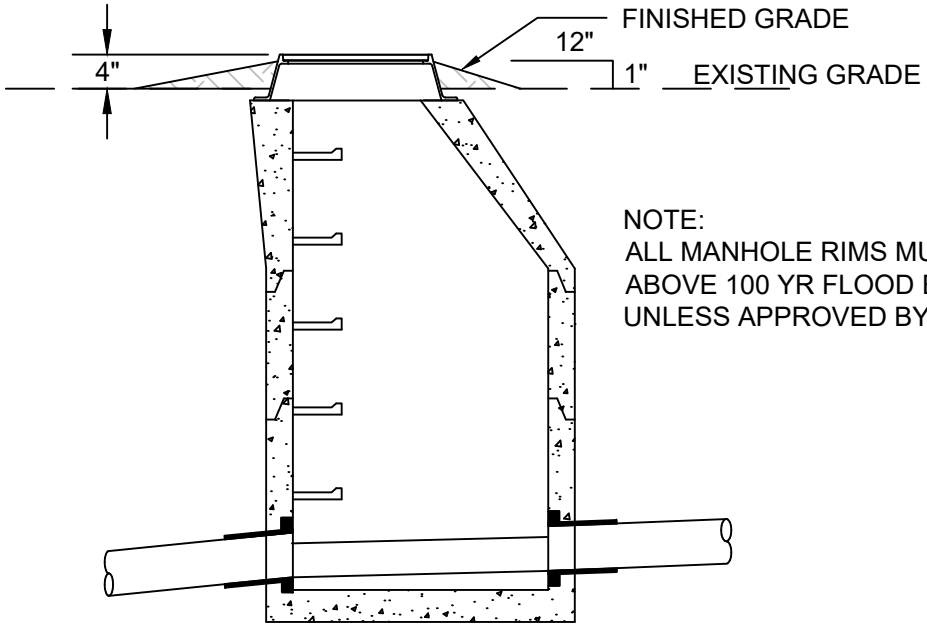


SIDE SLOPE



NOTE:
ALL MANHOLE RIMS MUST BE 1' ABOVE 100 YR FLOOD ELEVATION UNLESS APPROVED BY METRO.

N.T.S.

MANHOLE RIM ELEVATION - LAWN AREAS

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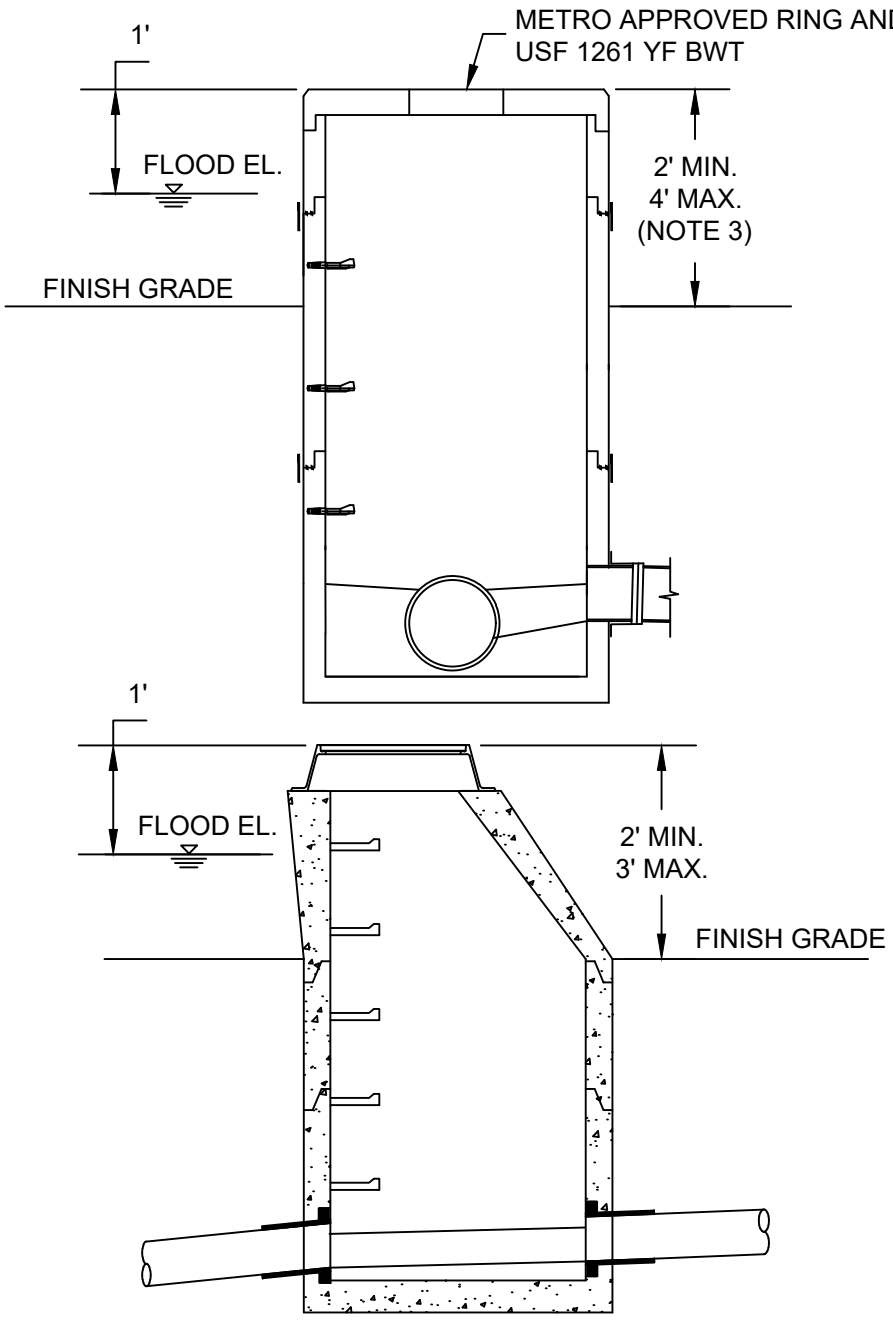

N.T.S.

NOTES:

1. MANHOLE RIM ELEVATION MUST BE A MINIMUM OF 1' ABOVE 100 YR FLOOD ELEVATION
2. MANHOLES IN NON-LAWN AREAS MUST HAVE A MINIMUM RIM ELEVATION OF 2' ABOVE FINISH GRADE
3. MAX HEIGHT OF RIM ELEVATION SHALL BE 4' ABOVE FINISH GRADE
4. MANHOLES GREATER THAN 3' ABOVE FINISH GRADE SHALL BE FLAT TOPS
5. FLAT TOP STRUCTURES TO USE USF 1261 YF BWT RING AND COVERS
6. **ALL MANHOLES IN FLOOD PLAIN TO HAVE WATERTIGHT COVERS**

MANHOLE RIM ELEVATION - NON-LAWN AREAS

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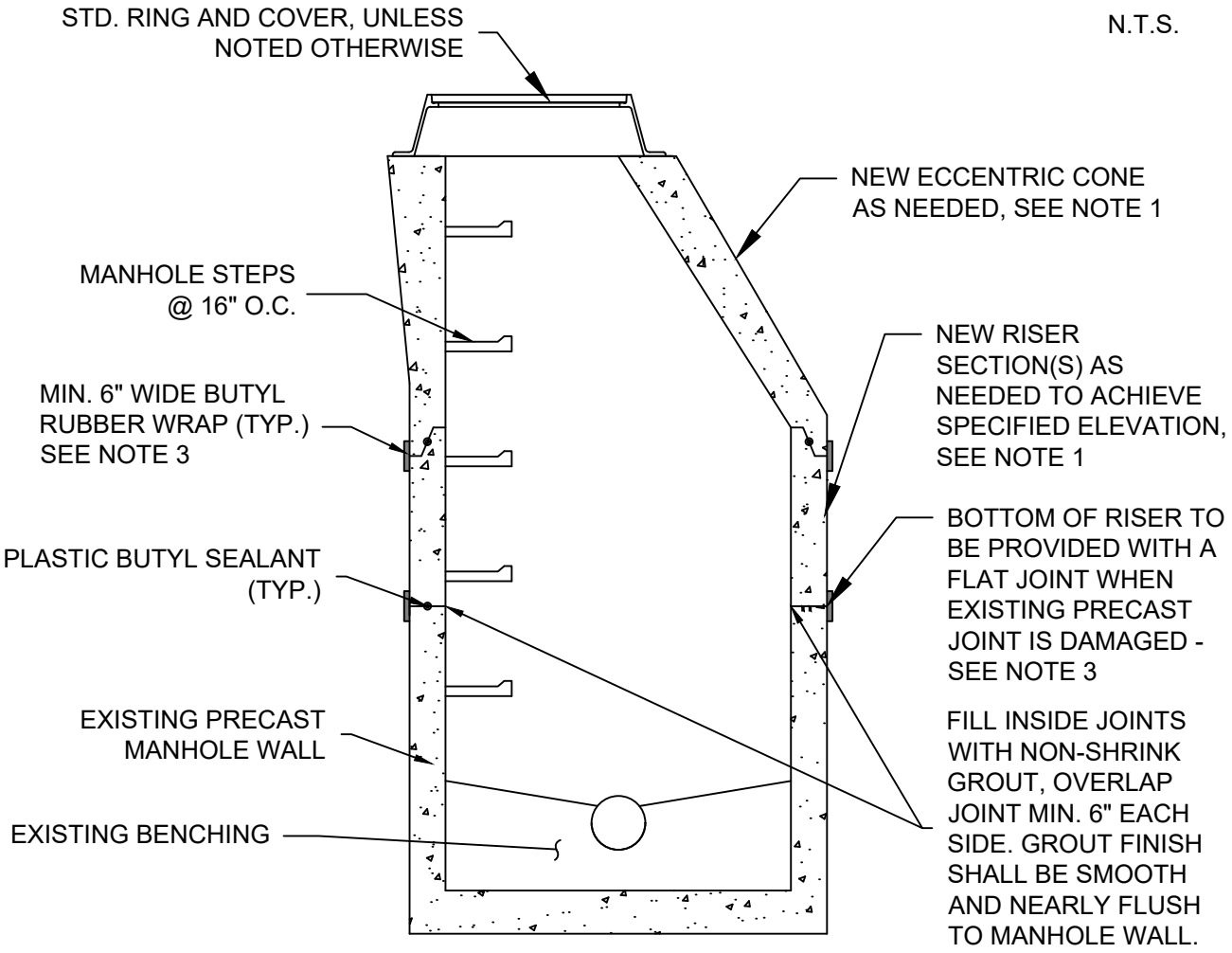

NOTES:

1. CONTRACTOR SHALL REMOVE EXISTING CONE SECTIONS AND/OR RISER SECTIONS AS DIRECTED BY METRO AND INSTALL NEW RISERS AND CONE SECTIONS TO ACHIEVE THE SPECIFIED ELEVATION. CONTRACTOR SHALL USE EXTREME CAUTION WHEN REMOVING EXISTING CONES AND RISERS TO PREVENT DAMAGE TO THE EXISTING JOINT. SEE NOTES 2 AND 3.
2. IF THE EXISTING PRECAST JOINT IS NOT DAMAGED AS DETERMINED BY METRO, CLEAN THE JOINT WITH A WIRE BRUSH, INSTALL 2 PIECES OF BUTYL RUBBER ALL AROUND, INSTALL THE NEW RISER OR CONE, AND WRAP THE JOINT WITH MIN 6" WIDE BUTYL RUBBER WRAP. FILL THE INSIDE OF THE JOINT WITH GROUT AS SHOWN.
3. IF THE EXISTING PRECAST JOINT IS DAMAGED AS DETERMINED BY METRO, CAREFULLY REMOVE THE JOINT COMPLETELY AND PROVIDE A NEW RISER OR CONE WITH A FLAT BOTTOM UNLESS APPROVED OTHERWISE. CLEAN THE JOINT WITH A WIRE BRUSH, INSTALL 2 PIECES OF BUTYL RUBBER ALL AROUND, INSTALL NEW RISER OR CONE, AND POUR A CONCRETE COLLAR TO COMPLETELY SEAL THE JOINT. COLLAR TO BE MIN 6 INCHES WIDE AND 12 INCHES HIGH CENTERED ON THE JOINT. FILL THE INSIDE OF THE JOINT WITH GROUT AS SHOWN.
4. DO NOT REUSE ANY DAMAGED MATERIALS.

MANHOLE ADJUSTMENT - PRECAST MANHOLE

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