

OLD NORTH STATE WATER
COMPANY

STANDARD WASTEWATER DETAILS



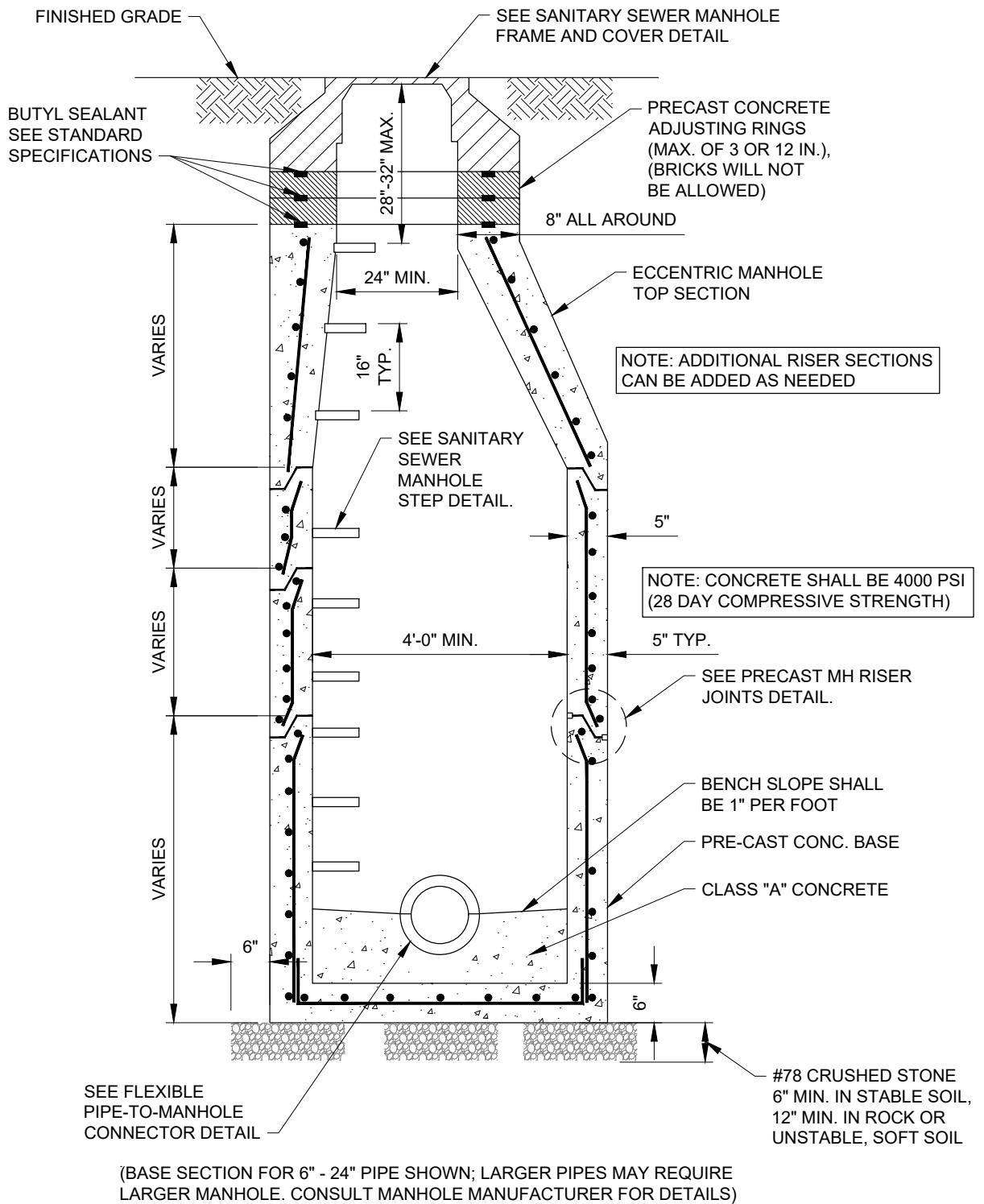
NSWC

OLD NORTH STATE WATER COMPANY

DETAIL NO.	DRAWING TITLE
SD-1	STANDARD SANITARY SEWER MANHOLE DETAIL
SD-2	WATERTIGHT SHALLOW SANITARY SEWER MANHOLE DETAIL
SD-3	SHALLOW SANITARY SEWER MANHOLE DETAIL
SD-4	SANITARY SEWER MANHOLE FRAME AND COVER DETAIL
SD-5	WATERTIGHT MANHOLE FRAME AND COVER DETAIL
SD-6	PRECAST MANHOLE RISER JOINT DETAIL
SD-7	SANITARY SEWER MANHOLE STEP DETAIL
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SD-33	LOW PRESSURE SERVICE LATERAL LAYOUT DETAIL

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STANDARD SANITARY SEWER MANHOLE DETAIL

N.T.S.

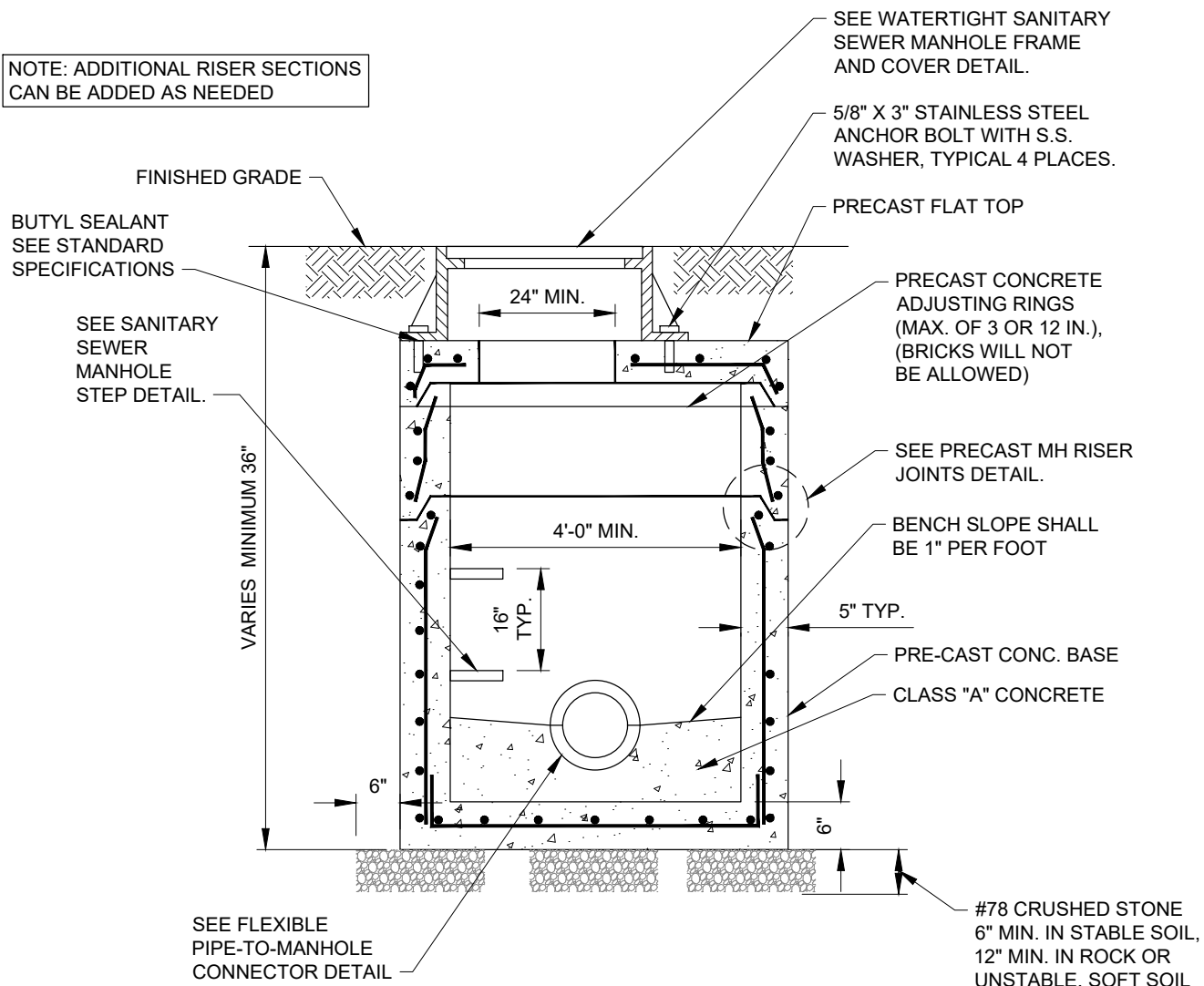
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STANDARD SANITARY SEWER
MANHOLE DETAIL

SD-1

NOTE: ADDITIONAL RISER SECTIONS CAN BE ADDED AS NEEDED



NOTE: CONCRETE SHALL BE 4000 PSI (28 DAY COMPRESSIVE STRENGTH)

WATERTIGHT SHALLOW SANITARY SEWER MANHOLE DETAIL

N.T.S.

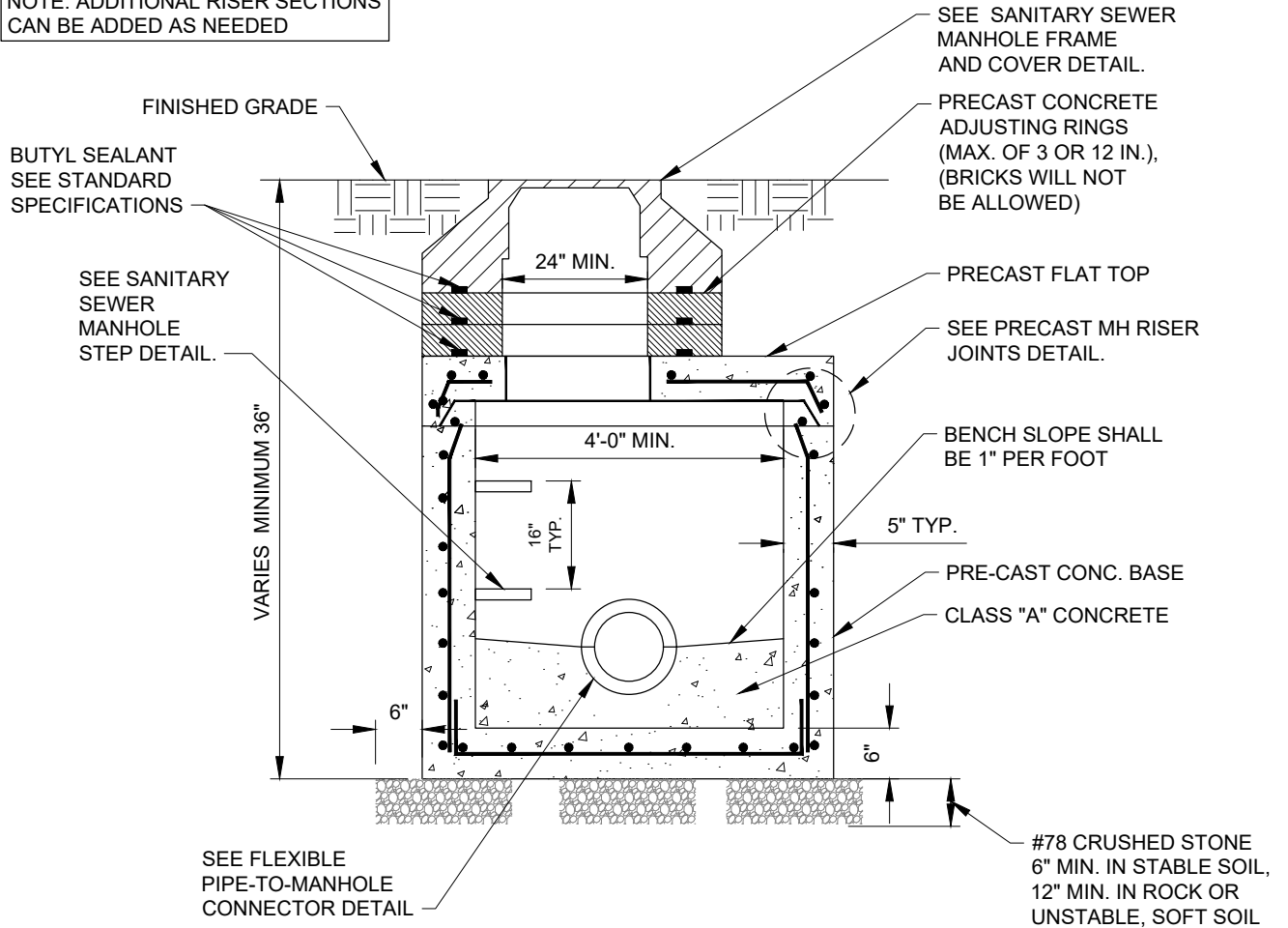
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WATERTIGHT SHALLOW SANITARY SEWER MANHOLE DETAIL

SD-2

NOTE: ADDITIONAL RISER SECTIONS CAN BE ADDED AS NEEDED



NOTE: CONCRETE SHALL BE 4000 PSI (28 DAY COMPRESSIVE STRENGTH)

SHALLOW SANITARY SEWER MANHOLE DETAIL

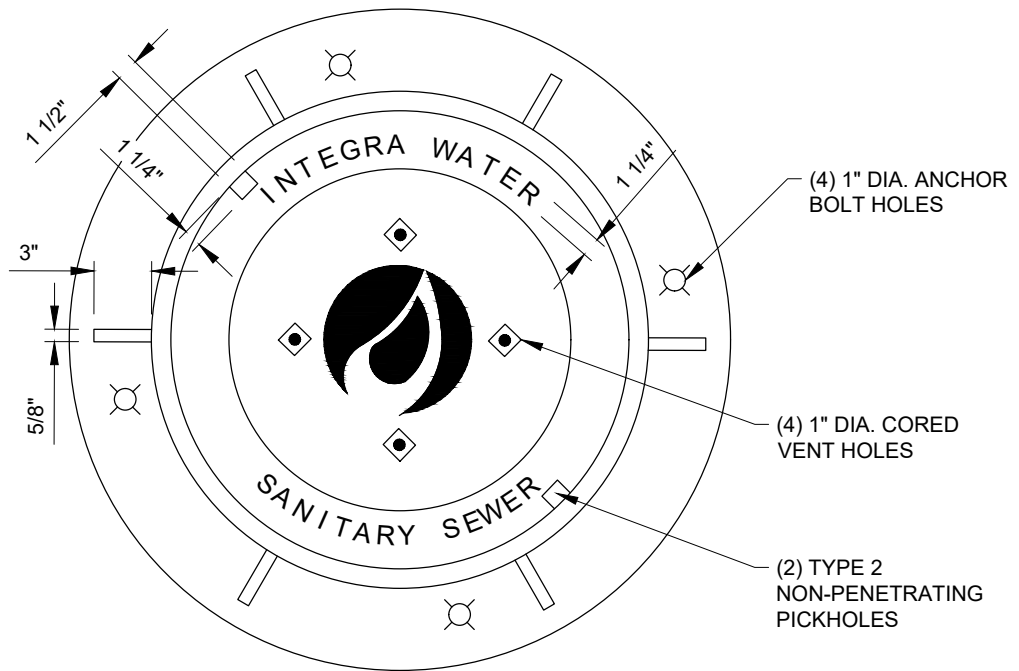
N.T.S.

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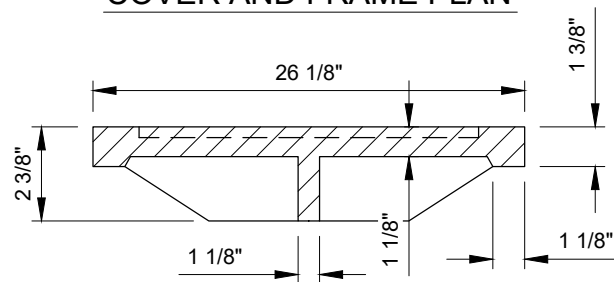


SHALLOW SANITARY SEWER
MANHOLE DETAIL

SD-3

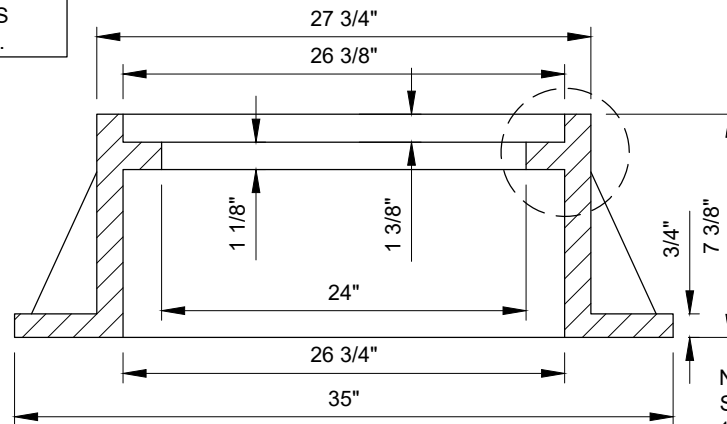


COVER AND FRAME PLAN



COVER SECTION

NOTE: BUTYL SEALANT SHALL BE USED TO SEAL FRAME TO MH AS DESCRIBED IN SPECIFICATIONS.



FRAME SECTION

NOTE: JOHN BOUCHARD & SONS CO. H2O LOADING 1150 FRAME AND COVER OR APPROVED EQUAL.

SANITARY SEWER MANHOLE FRAME & COVER DETAIL

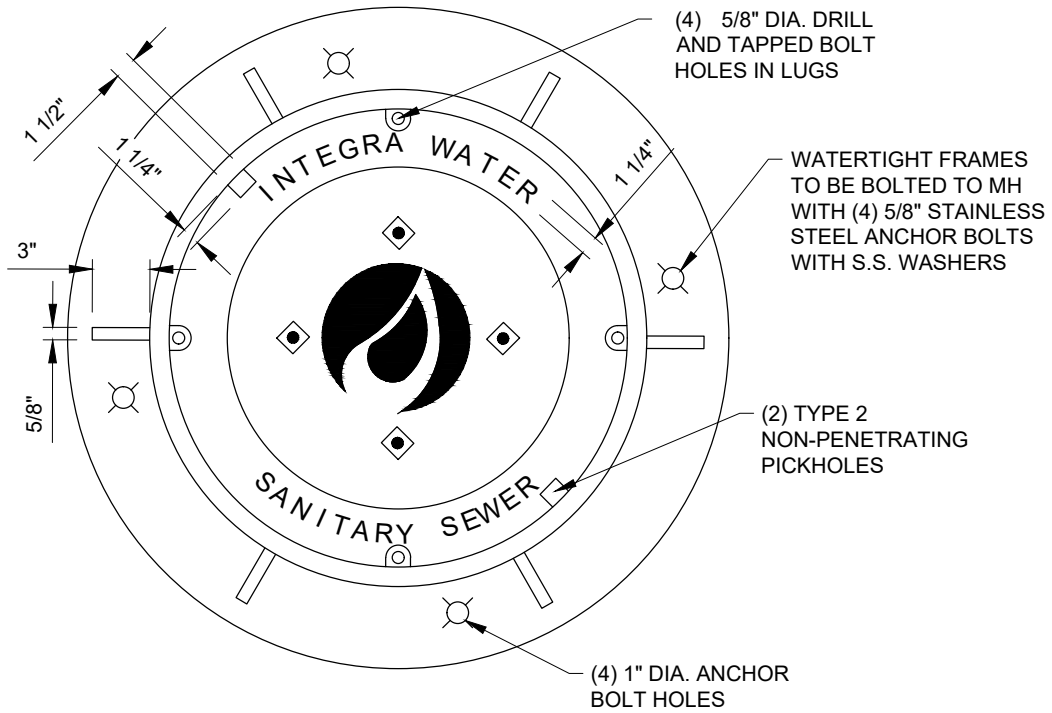
N.T.S.

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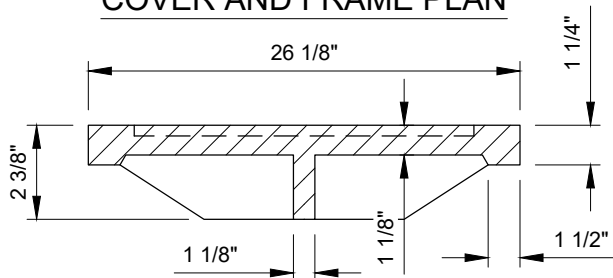


**SANITARY SEWER MANHOLE FRAME
AND COVER DETAIL**

SD-4

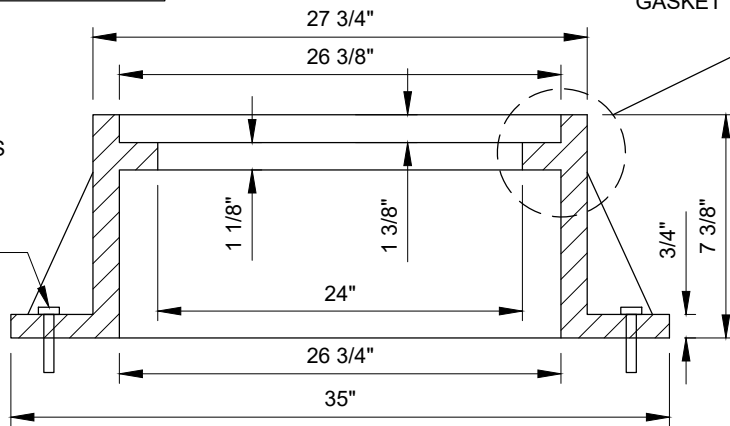


COVER AND FRAME PLAN



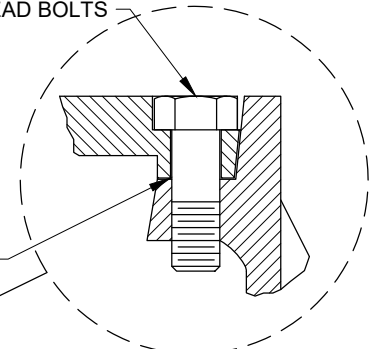
COVER SECTION

NOTE: BUTYL SEALANT SHALL BE USED TO SEAL FRAME TO MH AS DESCRIBED IN SPECIFICATIONS.



FRAME SECTION

(4) 5/8" X 2" STAINLESS STEEL HEX. HEAD BOLTS



WATERTIGHT DETAIL

NOTE: JOHN BOUCHARD & SONS CO. H2O LOADING 1150 FRAME AND COVER OR APPROVED EQUAL.

WATERTIGHT MANHOLE FRAME AND COVER DETAIL

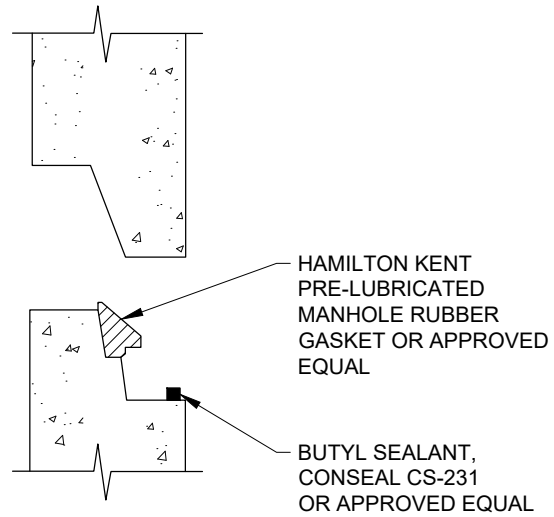
N.T.S.

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WATERTIGHT MANHOLE FRAME AND COVER DETAIL

SD-5



NOTE:
ALL JOINTS SHALL BE OF SUCH DESIGN AS WILL
PERMIT EFFECTIVE JOINING WITH
NO LEAKAGE AND NO INFILTRATION AND TO PERMIT
PLACEMENT WITHOUT APPRECIABLE
IRREGULARITIES ON THE INTERIOR WALL.

PRECAST MANHOLE RISER JOINT DETAIL

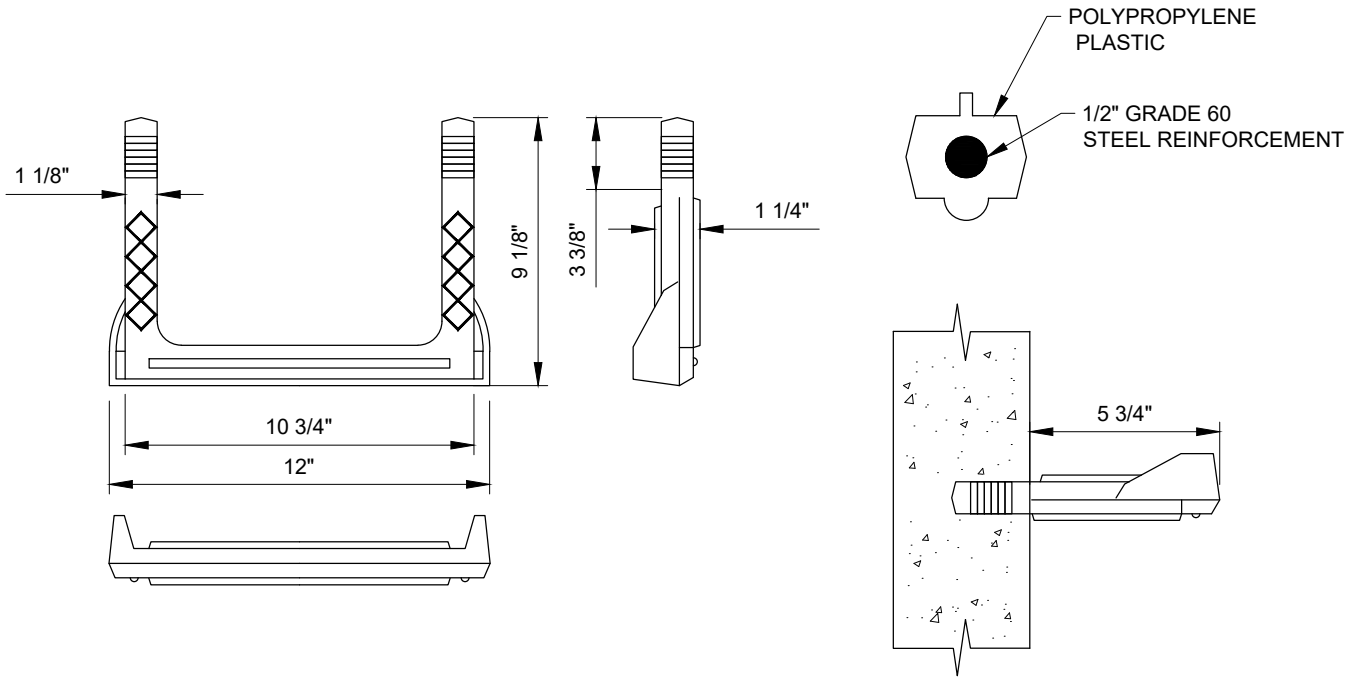
N.T.S.

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PRECAST MANHOLE RISER JOINT
DETAIL

SD-6



NOTE:
 MANHOLE STEPS SHALL BE MANUFACTURED FROM POLYPROPYLENE PLASTIC REINFORCED WITH A 12" GRADE 60 STEEL ROD. STEPS SHALL BE EMBEDDED IN THE RISER. BASE AND TOP SECTIONS A MINIMUM OF 3" AT THE TIME OF CONSTRUCTION. MANHOLE STEPS SHALL BE A MINIMUM OF 10 3/4" WIDE AND EXTEND FROM THE MANHOLE WALL A MINIMUM OF 5 3/4".

SANITARY SEWER MANHOLE STEP DETAIL

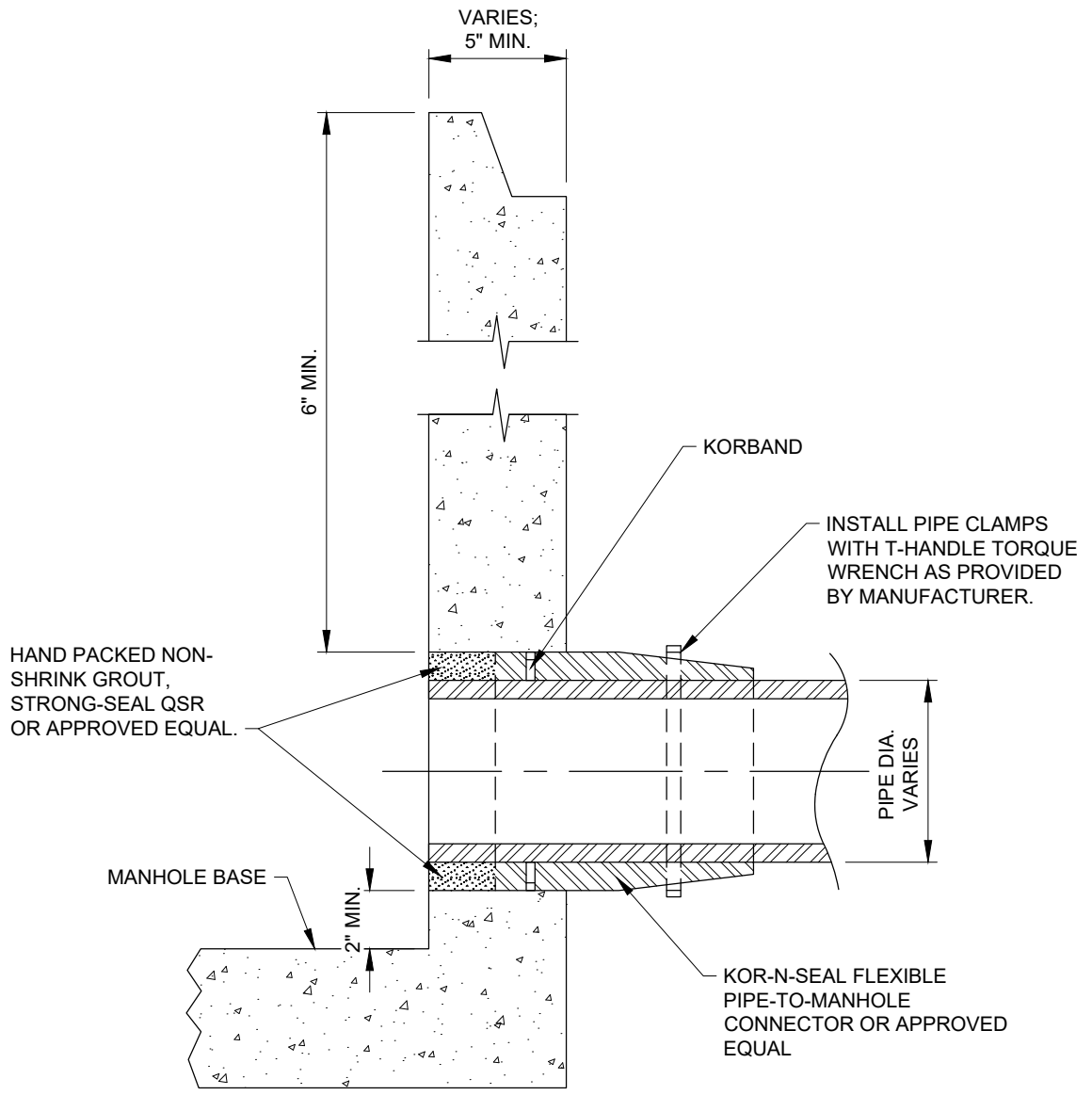
N.T.S.

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SANITARY SEWER MANHOLE STEP
 DETAIL

SD-7



FLEXIBLE PIPE TO MANHOLE CONNECTOR DETAIL (OPTION 1)

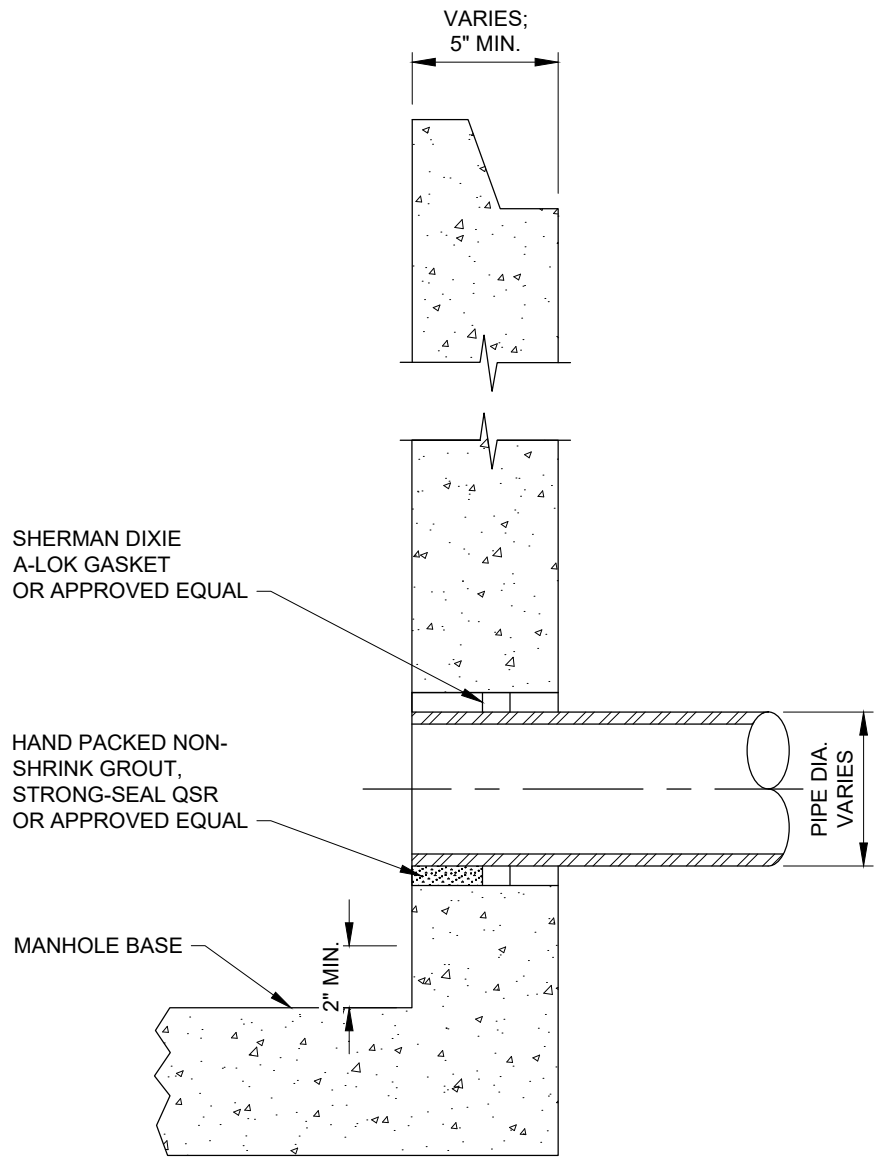
N.T.S.

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FLEXIBLE PIPE TO MANHOLE
CONNECTOR DETAIL (OPTION 1)

SD-8



FLEXIBLE PIPE TO MANHOLE CONNECTOR DETAIL (OPTION 2)

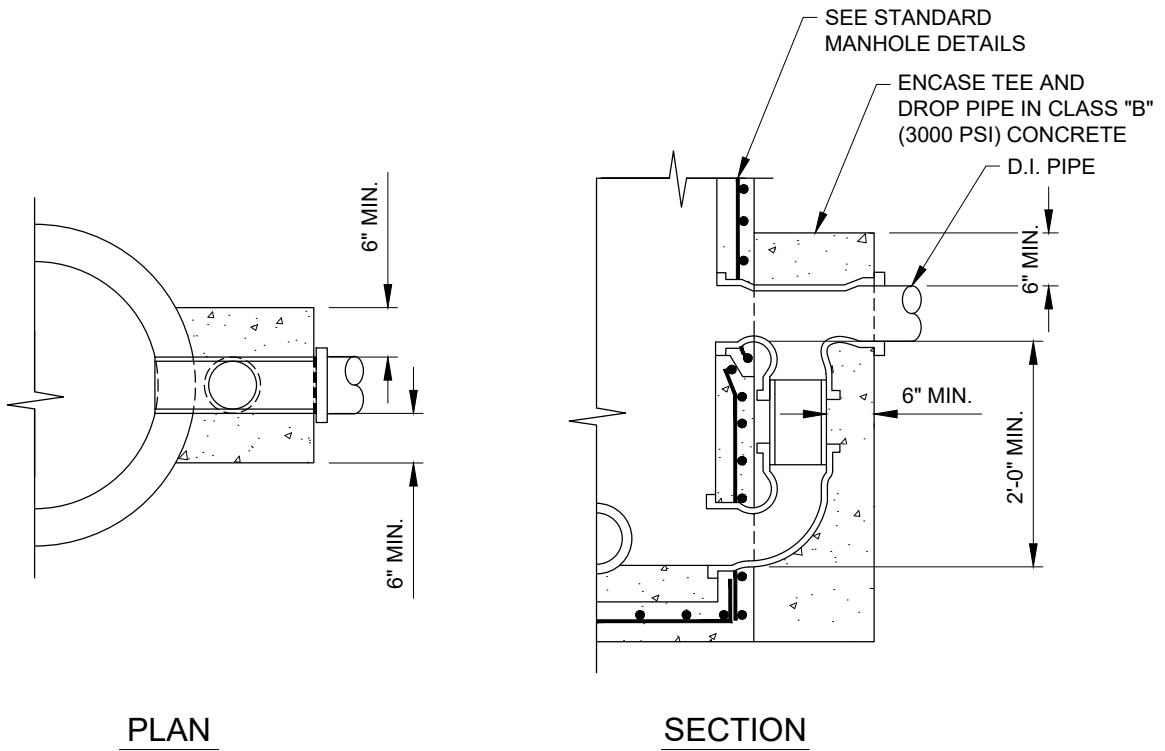
N.T.S.

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FLEXIBLE PIPE TO MANHOLE
CONNECTOR DETAIL (OPTION 2)

SD-9

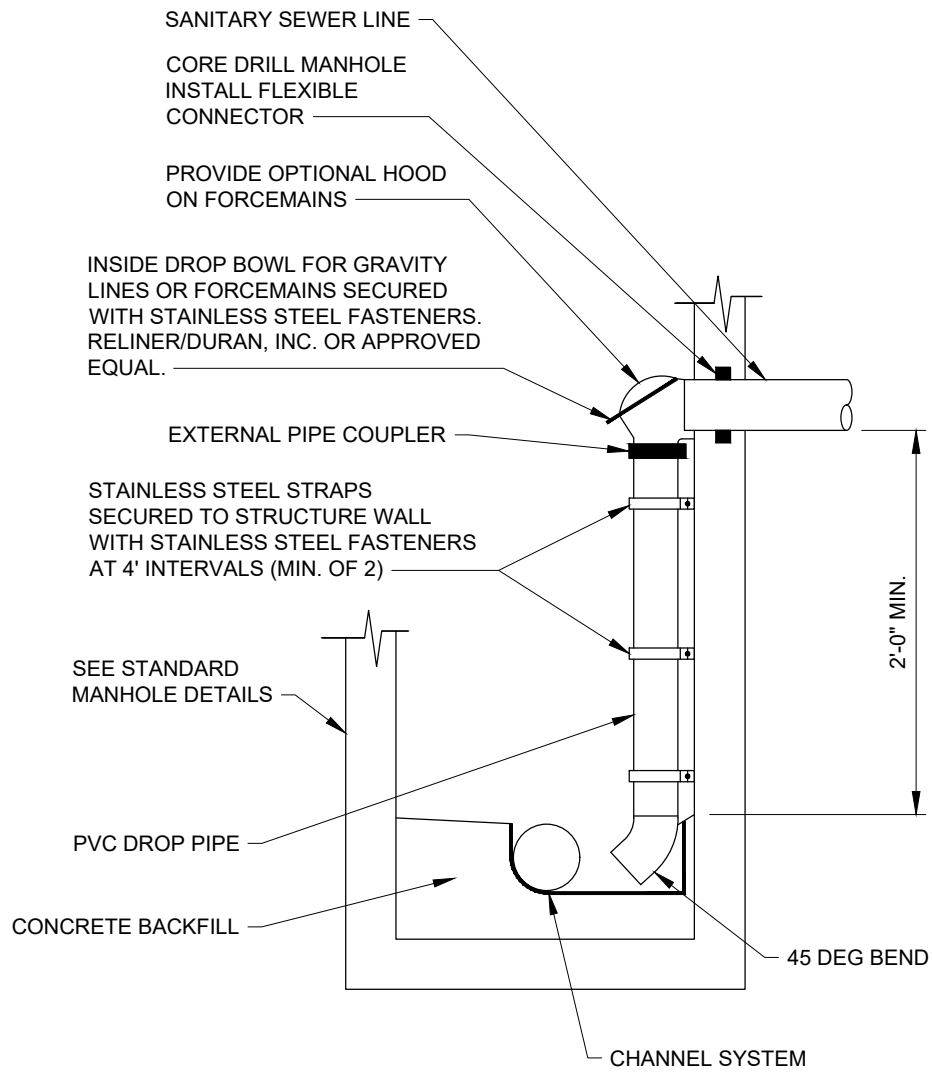


- NOTES:
1. EXTERIOR DROP CONNECTION SHALL BE USED FOR SEWERS 12" IN DIAMETER AND GREATER.

EXTERIOR MANHOLE DROP CONNECTION DETAIL

N.T.S.

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NOTES:

- INTERNAL DROP SHALL NOT BE USED FOR PIPE SIZES GREATER THAN 10". FOR PIPE SIZES EXCEEDING 10", SEE DETAIL SD-10.

INTERIOR MANHOLE DROP CONNECTION DETAIL

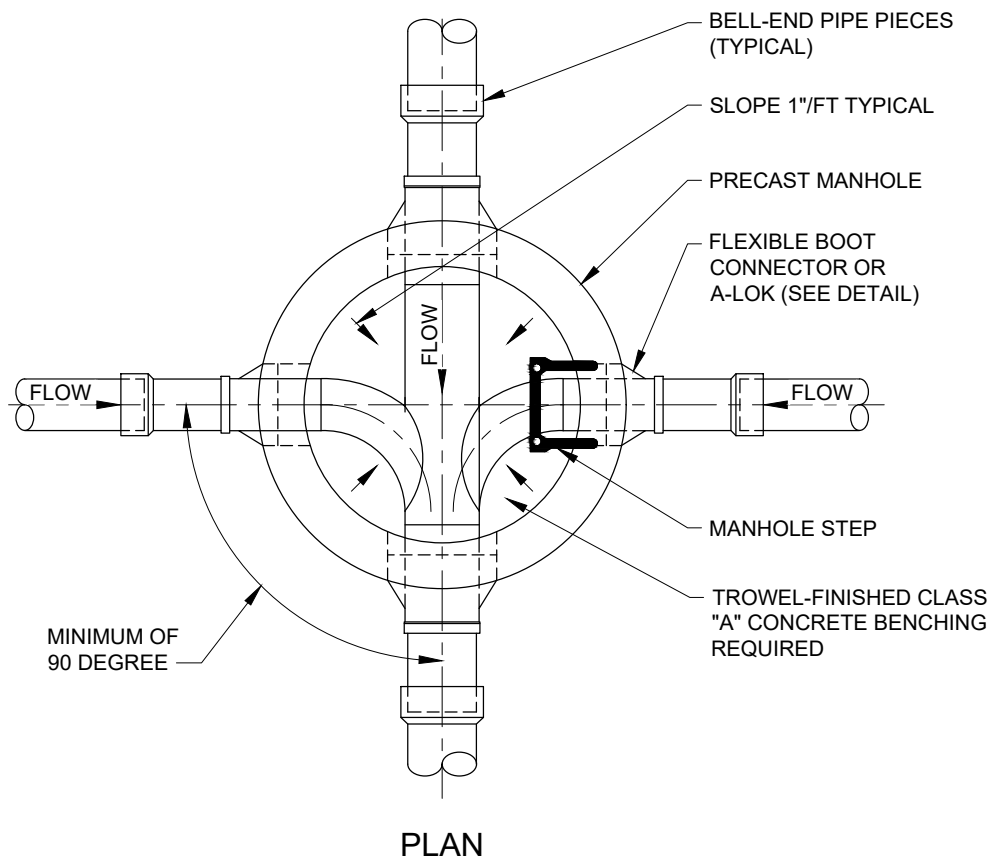
N.T.S.

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**SANITARY SEWER INSIDE MANHOLE
DROP CONNECTION DETAIL**

SD-11



MANHOLE INVERT DETAIL

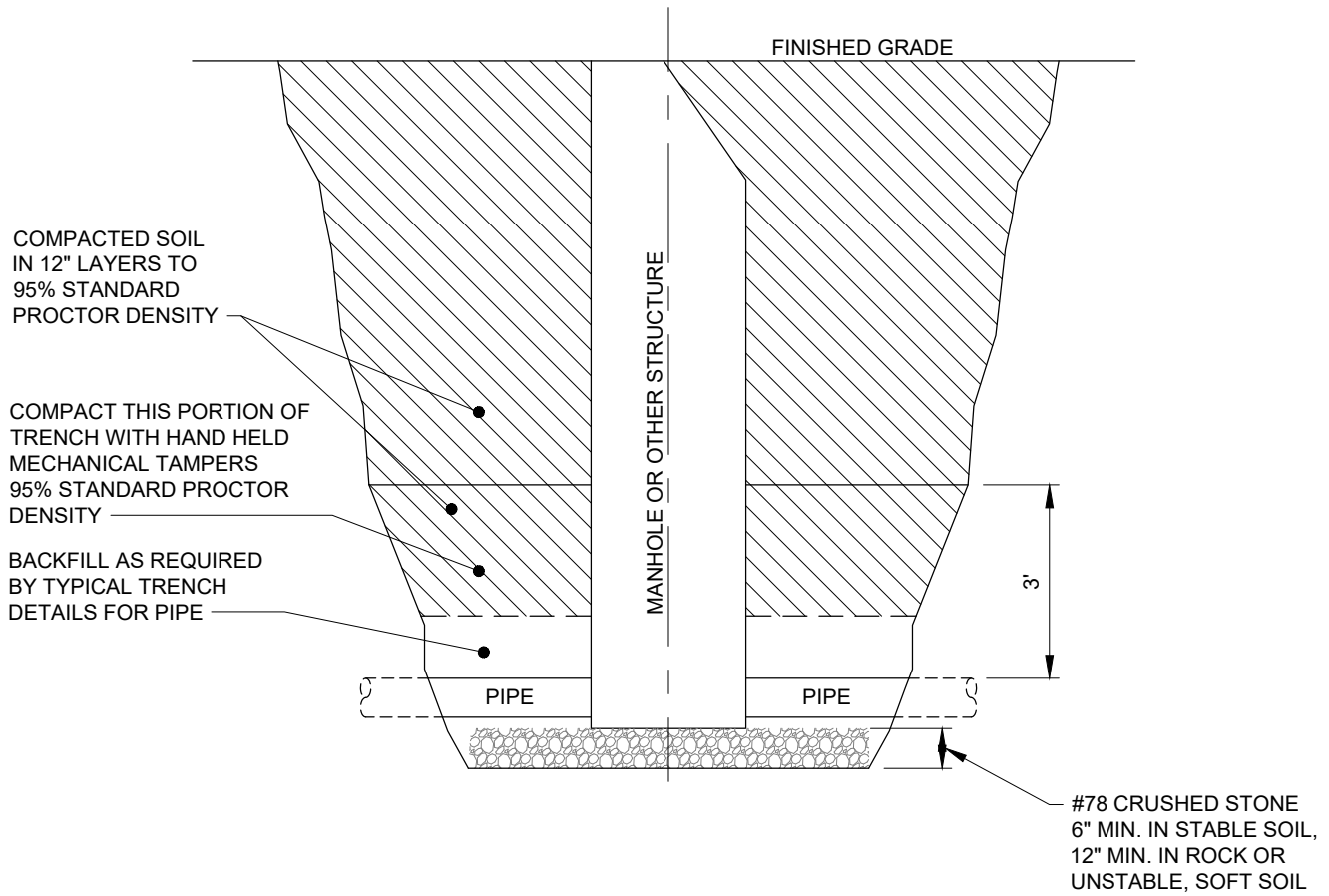
N.T.S.

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MANHOLE INVERT DETAIL

SD-12



NOTE: ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION

MANHOLE BEDDING & BACKFILL DETAIL IN NON-TRAFFIC AREAS

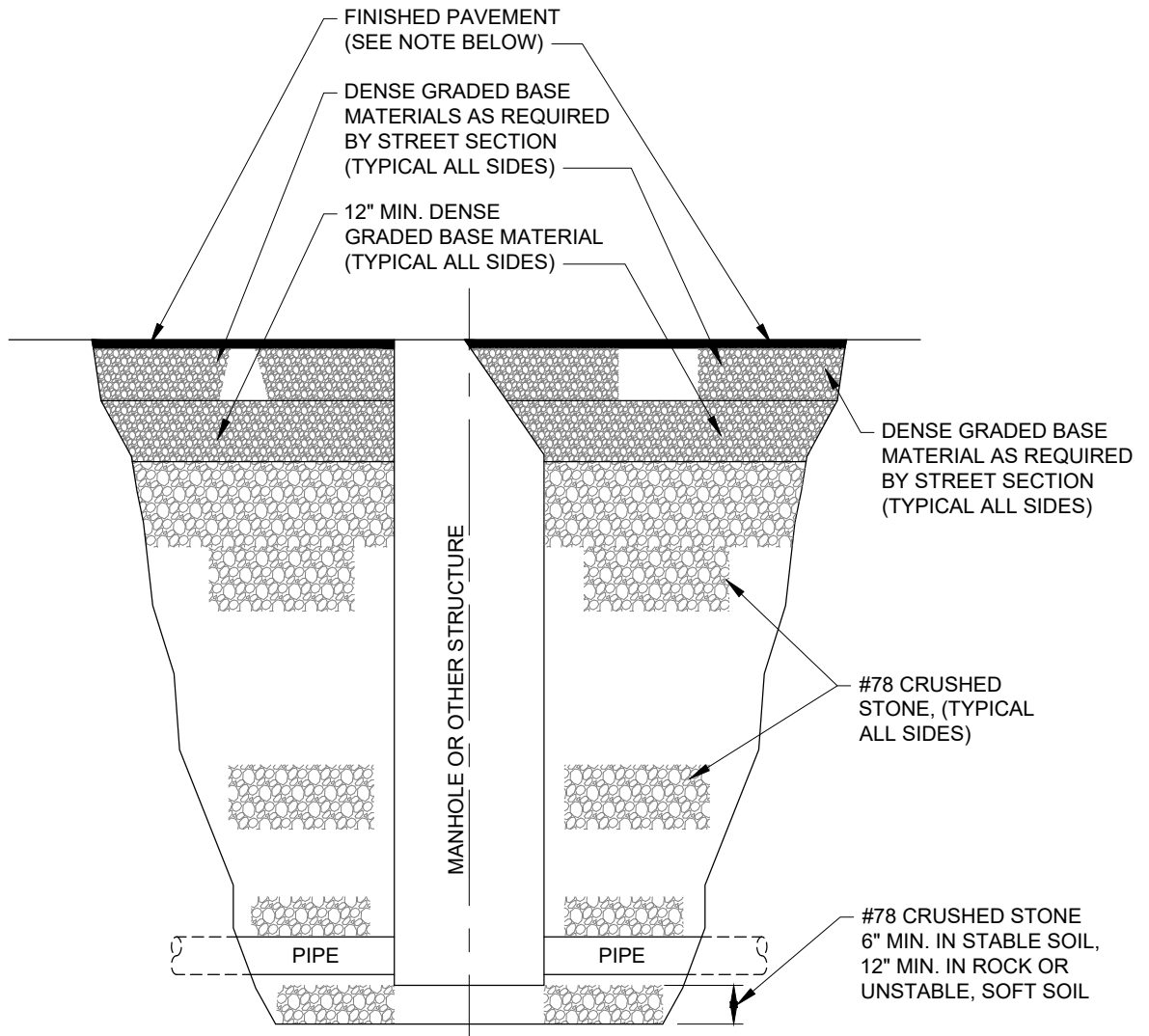
N.T.S.

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**MANHOLE BEDDING AND BACKFILL
DETAIL IN NON-TRAFFIC AREAS**

SD-13



- NOTES:
1. TRAFFIC AREAS SHALL EXTEND TO 5 FT BEYOND BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED ON PLAN VIEW.
 2. ASPHALT PAVING FOR STREETS SHALL BE ASPHALT TYPE AS REQUIRED PER LOCAL JURISDICTION.
 3. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.

MANHOLE BEDDING & BACKFILL DETAIL IN TRAFFIC AREAS (OPTION 1)

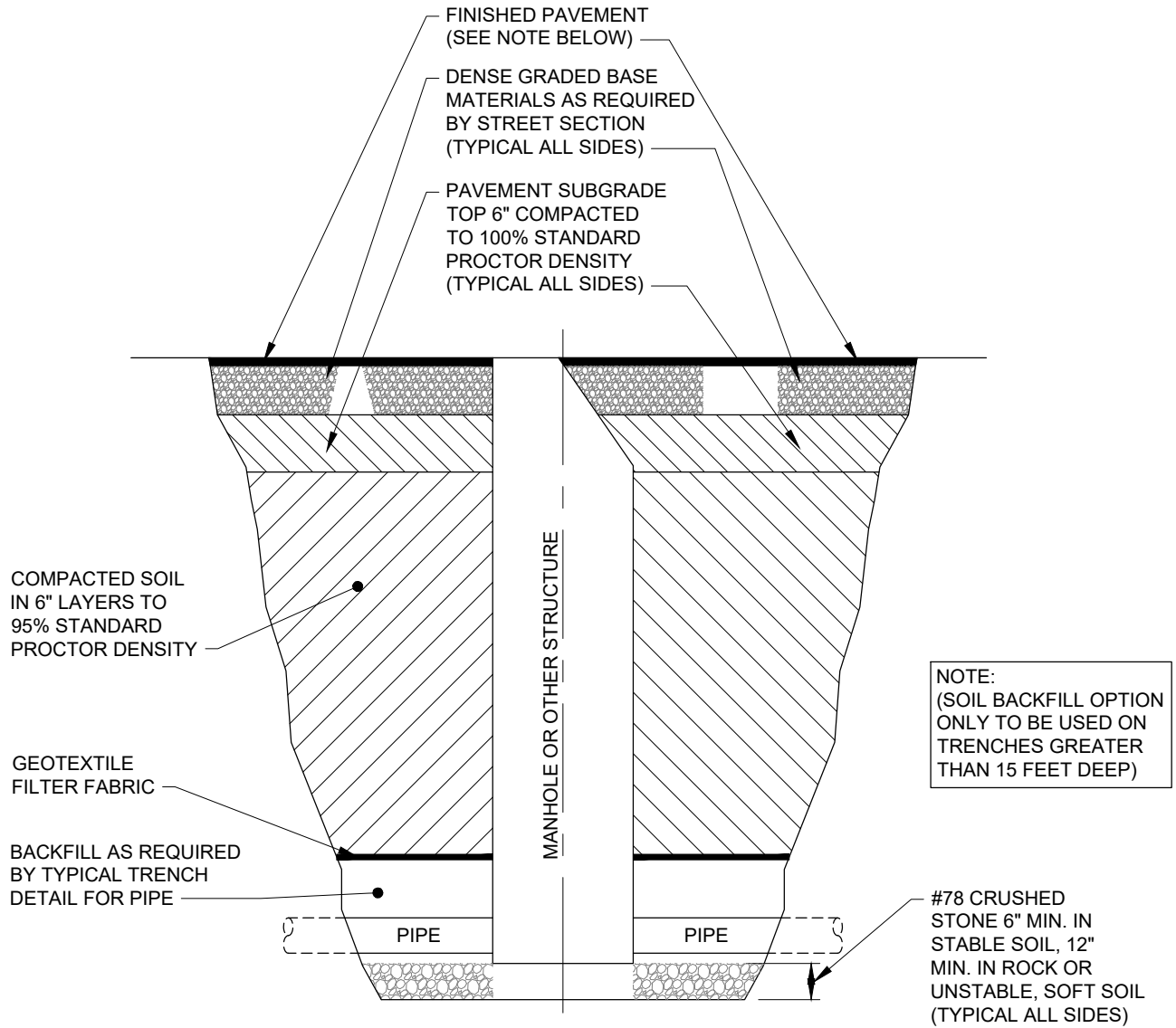
N.T.S.

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MANHOLE BEDDING AND BACKFILL
DETAIL IN TRAFFIC AREAS (OPTION 1)

SD-14



NOTE:
 (SOIL BACKFILL OPTION
 ONLY TO BE USED ON
 TRENCHES GREATER
 THAN 15 FEET DEEP)

- NOTES:
1. TRAFFIC AREAS SHALL EXTEND TO 5 FT BEYOND BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED ON PLAN VIEW.
 2. ASPHALT PAVING FOR STREETS SHALL BE ASPHALT TYPE AS REQUIRED PER LOCAL JURISDICTION.
 3. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.

MANHOLE BEDDING & BACKFILL DETAIL IN TRAFFIC AREAS (OPTION 2)

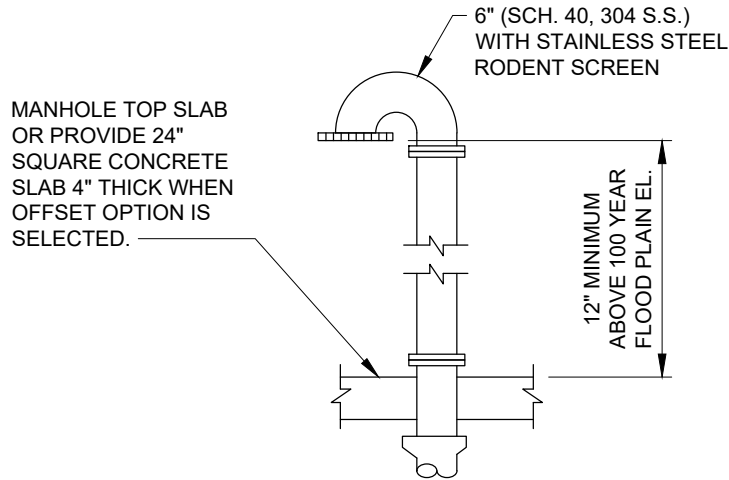
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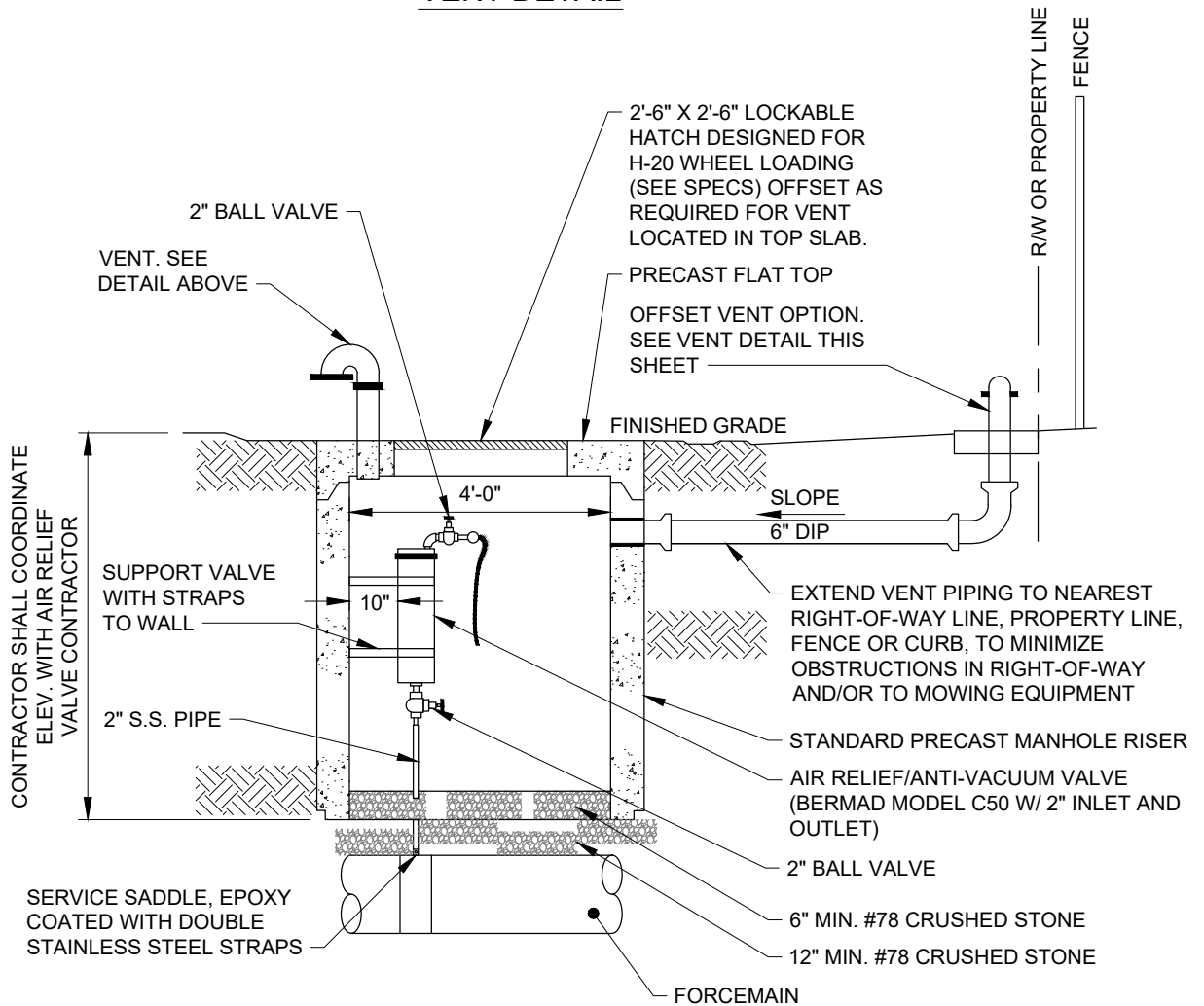
MANHOLE BEDDING AND BACKFILL
 DETAIL IN TRAFFIC AREAS (OPTION 2)

SD-15



NOTE:
VENT OPTION UTILIZED
SHALL BE APPROVED BY
Old North State Water
Company PRIOR TO
CONSTRUCTION.

VENT DETAIL



**AIR RELIEF VALVE ASSEMBLY DETAIL
(OFFSITE FORCEMAIN)**

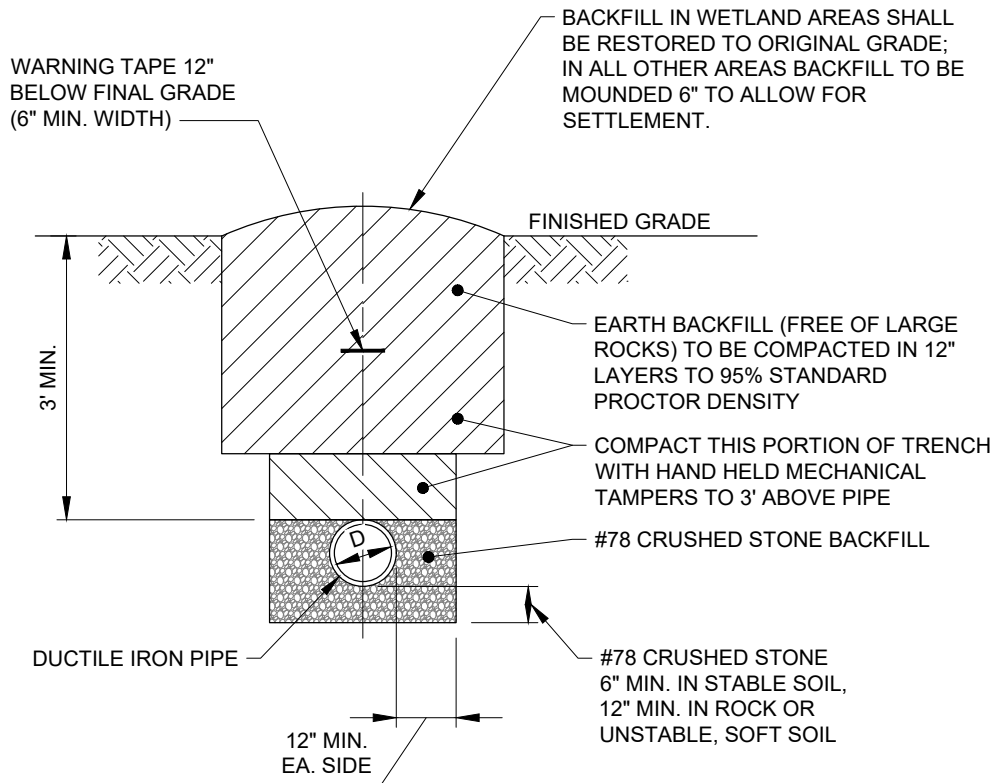
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AIR RELIEF VALVE ASSEMBLY DETAIL
(OFF SITE FORCEMAIN)

SD-16



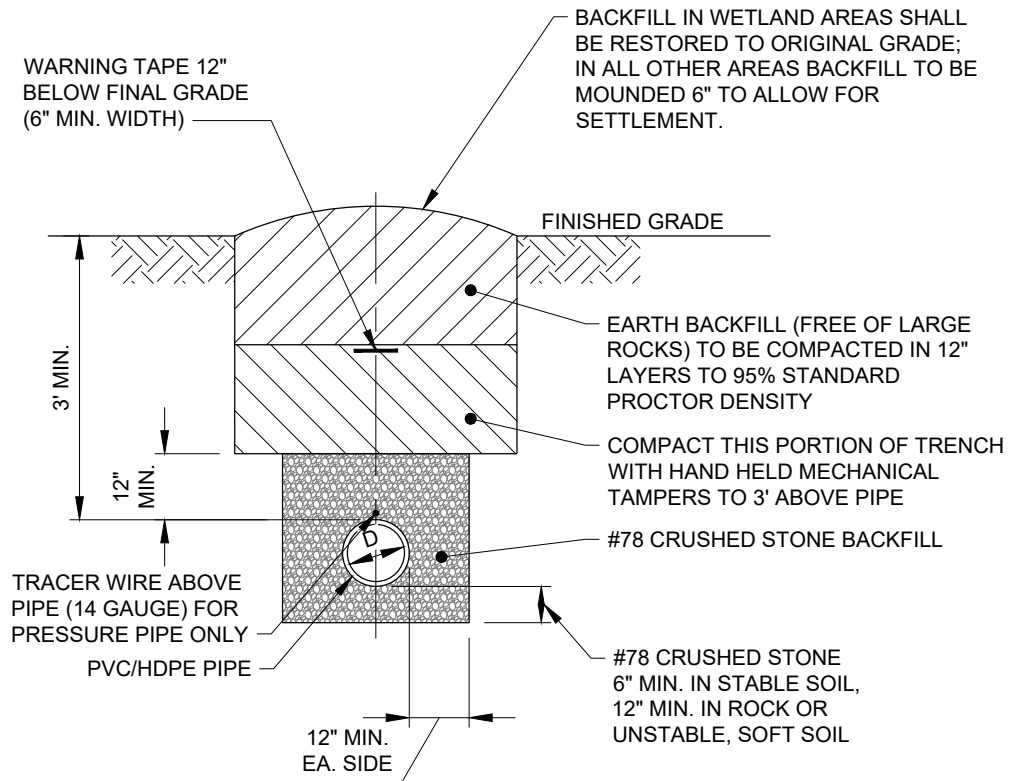
NOTES:

1. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION

DUCTILE IRON PIPE BEDDING DETAIL IN NON-TRAFFIC AREAS

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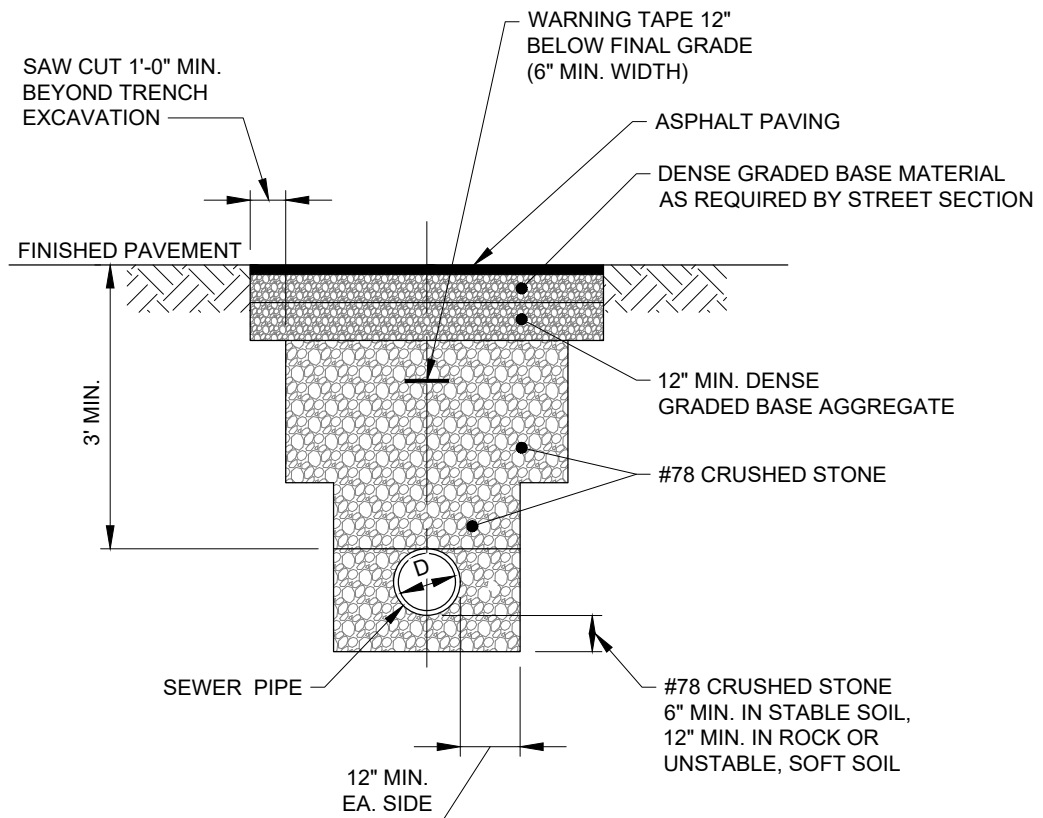
NOTES:

1. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION

FLEXIBLE PIPE BEDDING DETAIL IN IN NON-TRAFFIC AREAS

N.T.S.

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NOTES:

1. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.
2. TRAFFIC AREAS TO EXTEND 5 FT BEYOND BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED ON PLAN VIEW.
3. ASPHALT PAVING FOR ALL PUBLIC ROADWAYS SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.
4. STEEL ENCASEMENT SHALL BE USED UNDER ROADWAYS WHERE SPECIFIED.

PIPE BEDDING DETAIL IN TRAFFIC AREAS (OPTION 1)

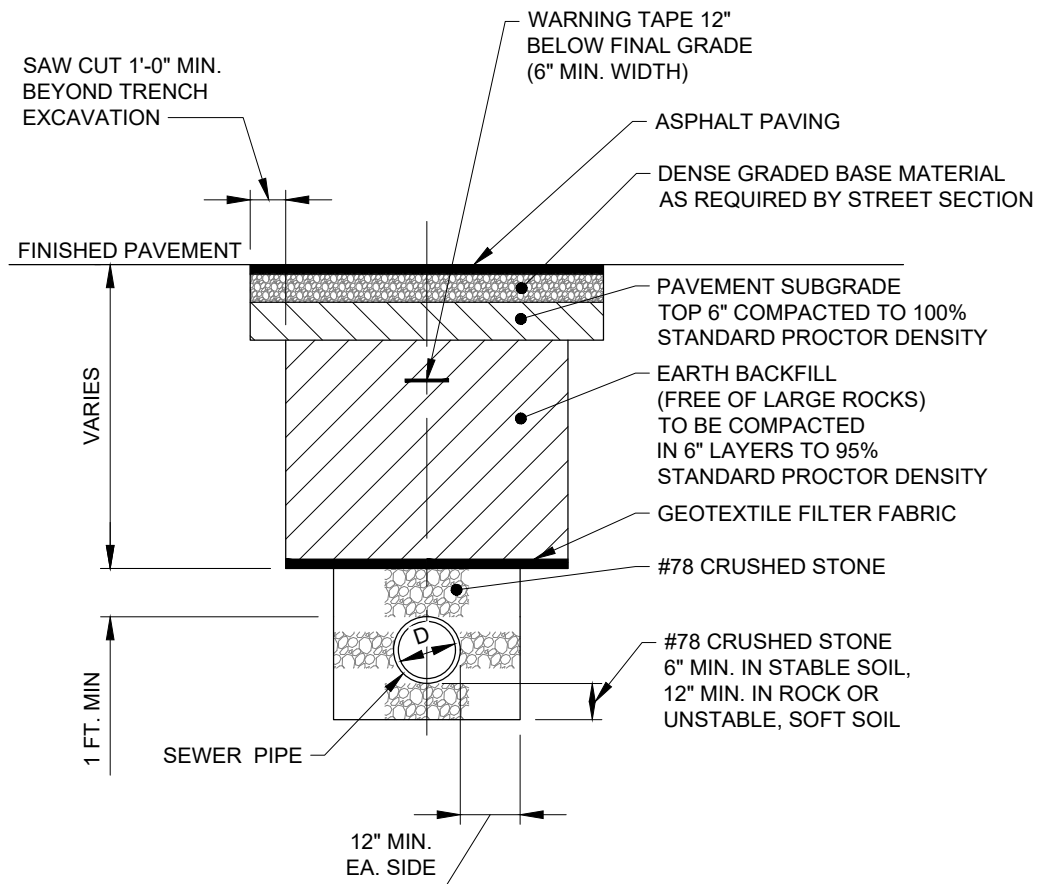
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PIPE BEDDING DETAIL IN TRAFFIC AREAS (OPTION 1)

SD-19



NOTES:

1. THIS DETAIL SHALL ONLY BE USED IF TRENCH DEPTHS EXCEED 15 FEET.
2. ALL EXCAVATION WORK SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.
3. TRAFFIC AREAS TO EXTEND 5 FT BEYOND BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED ON PLAN VIEW.
4. ASPHALT PAVING FOR ALL PUBLIC ROADWAYS SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION.
5. STEEL ENCASMENT SHALL BE USED UNDER ROADWAYS WHERE SPECIFIED.

**PIPE BEDDING DETAIL
IN TRAFFIC AREAS (OPTION 2)**

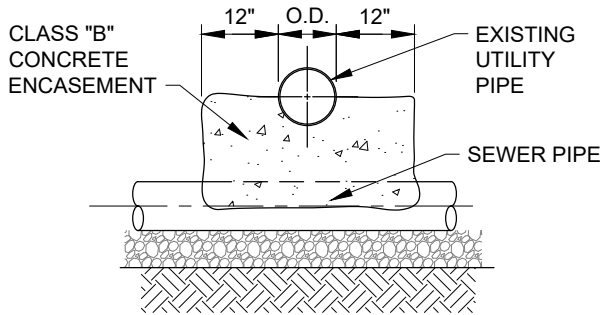
N.T.S.

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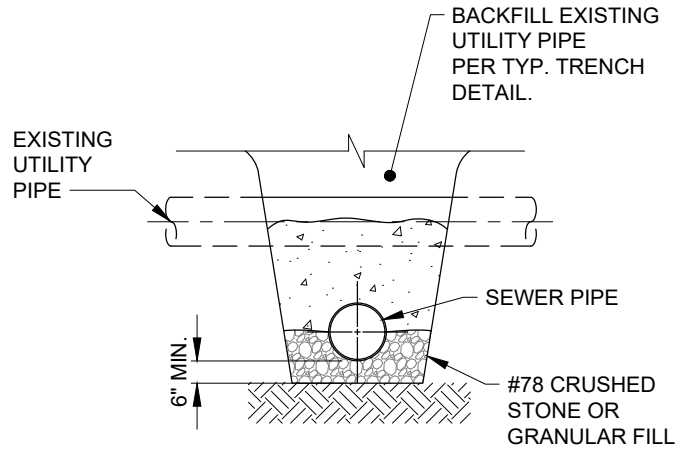
**PIPE BEDDING DETAIL IN TRAFFIC
AREAS (OPTION 2)**

SD-20

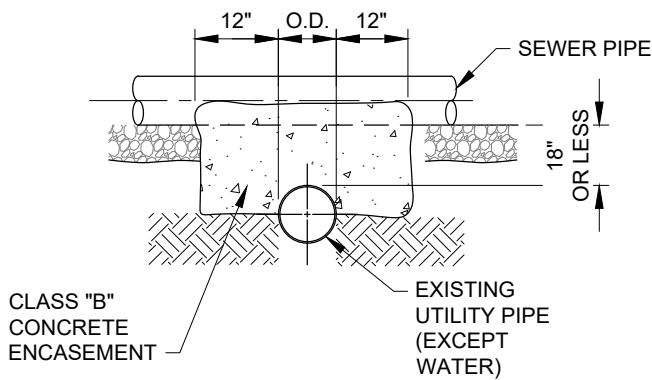


* IF THE CLEARANCE IS 12" OR LESS, ENCASE SEWER PIPE 10 FT. FROM CENTERLINE OF WATER PIPE IN BOTH DIRECTIONS.

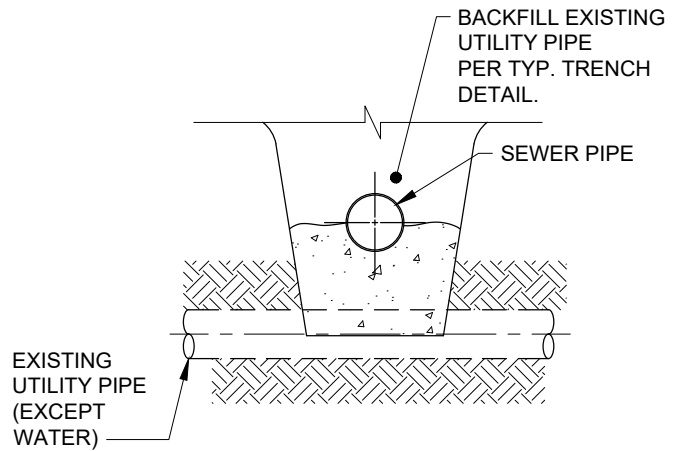
CASE I - SIDE VIEW



CASE I - END VIEW



CASE II - SIDE VIEW



CASE II - END VIEW

NOTES:

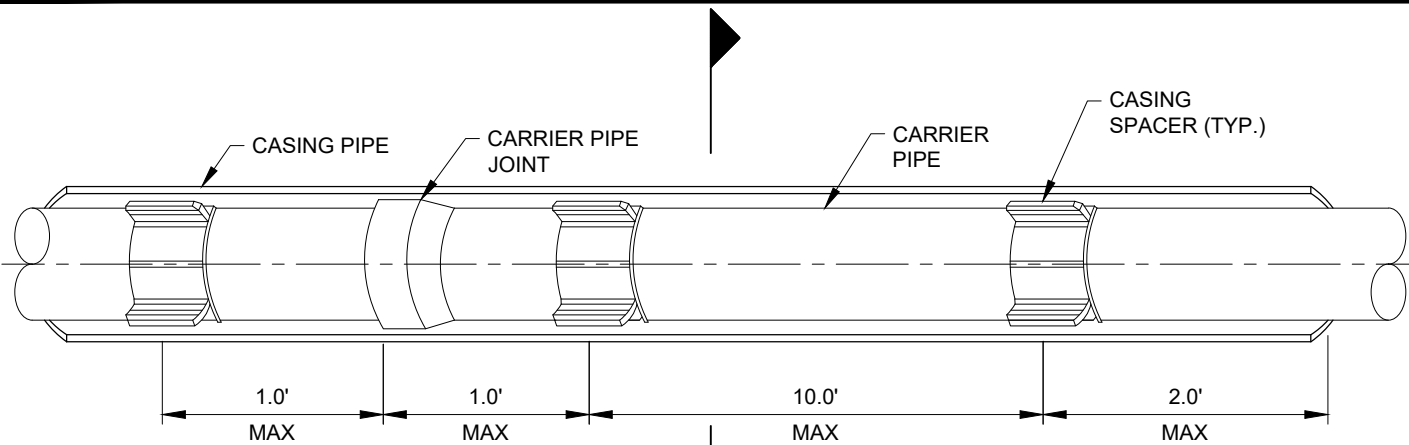
1. RELOCATION OF A UTILITY WILL BE THE RESPONSIBILITY OF THAT UTILITY, HOWEVER, CONTRACTOR SHALL COORDINATE WITH OTHER UTILITIES.
2. SANITARY SEWER SHALL ALWAYS BE LOCATED BENEATH WATER LINES. WRITTEN APPROVAL SHALL BE REQUIRED FROM Old North State Water Company AND LOCAL UTILITY COMPANY FOR A SANITARY SEWER LINE TO CROSS ABOVE.
3. ENCASEMENT SHALL BE USED WHEN CLEARANCE BETWEEN SEWER LINE AND UTILITY PIPE IS 18" OR LESS.
4. "UTILITY PIPE" INCLUDES UNDERGROUND WATER, GAS, TELEPHONE, AND ELECTRICAL CONDUITS, STORM AND SANITARY SEWERS, ETC.

UTILITY CROSSING DETAILS

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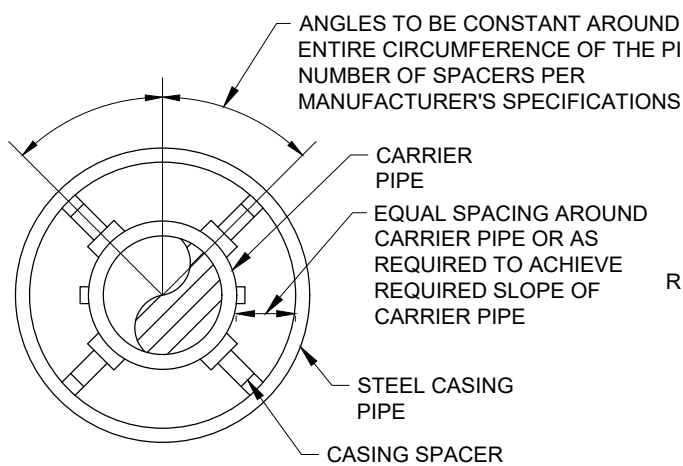


ELEVATION VIEW

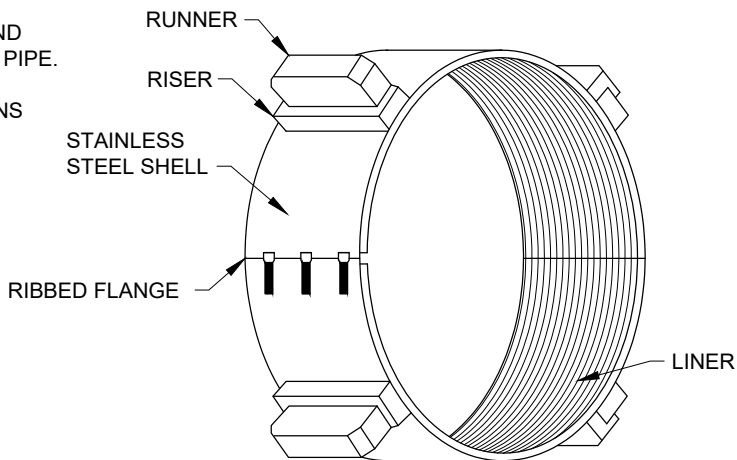
STEEL CASING PIPE		
PIPE DIAMETER (IN.)	MIN. CASING DIAMETER (IN.)	MIN. WALL THICKNESS (IN.)
2	6	0.250
4	8	0.250
6	12	0.250
8	16	0.250
12	24	0.250
20	30	0.312
42	54	0.500
48	60	0.625

NOTES:

1. CASING END SEALS SHALL BE USED TO SEAL OFF EACH END OF THE CASING PIPE. STAINLESS STEEL BANDS SHALL BE USED TO CONNECT THE END SEAL TO THE CASING PIPE AND CARRIER PIPE.



SECTION A-A



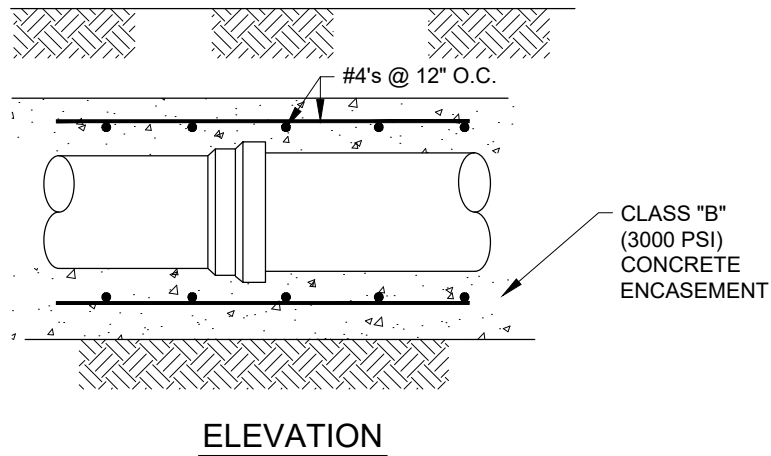
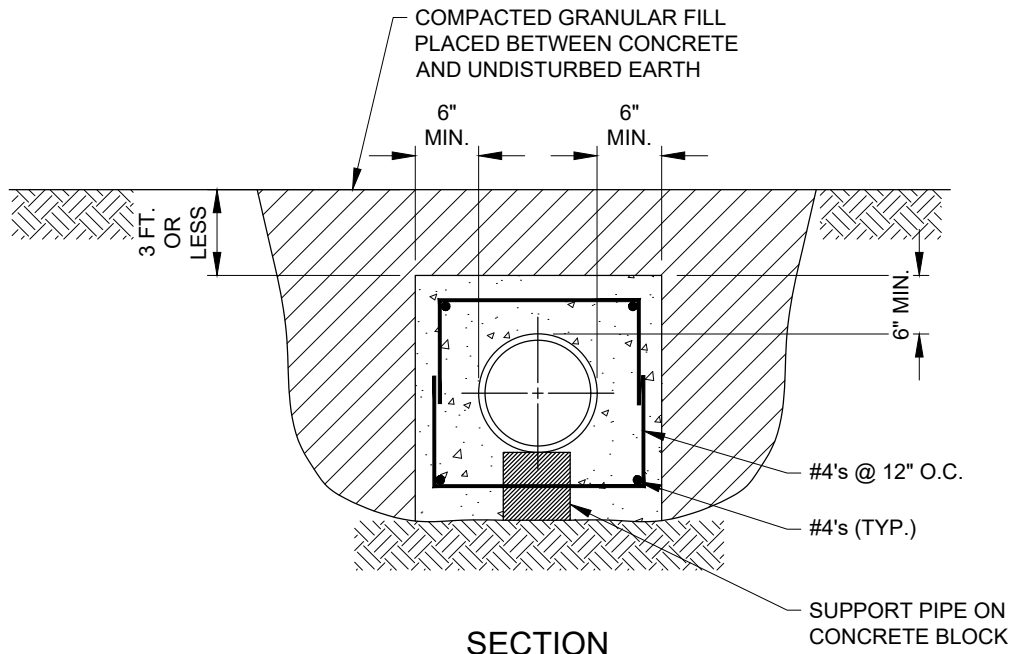
SPACER ISOMETRIC VIEW

STEEL CASING PIPE DETAIL

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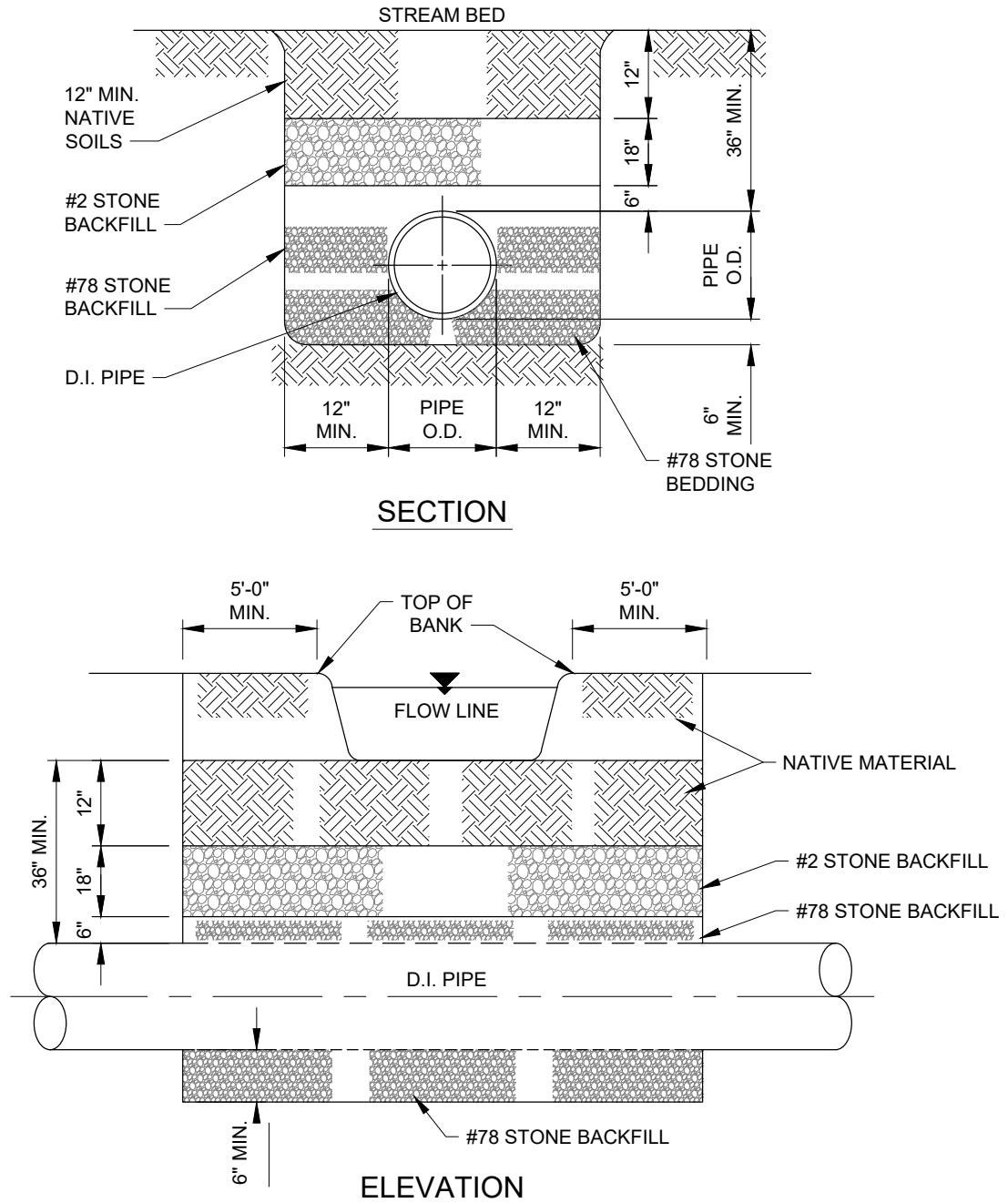
NOTES:

1. THIS METHOD OF INSTALLATION MAY ALSO BE NECESSARY ON CREEKS/STREAMS WITH HIGH VULNERABILITY TO EROSION.
2. DETAIL SHOWN IS MINIMUM REQUIREMENTS. CREEK CROSSING SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION WHICH MAY BE MORE STRINGENT.

**SHALLOW CREEK CROSSING
CONCRETE ENCASEMENT DETAIL**

N.T.S.

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- NOTES:
1. THIS METHOD OF INSTALLATION MAY ALSO BE NECESSARY ON CREEKS/STREAMS WITH HIGH VULNERABILITY TO EROSION.
 2. DETAIL SHOWN IS MINIMUM REQUIREMENTS. CREEK CROSSING SHALL BE IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION WHICH MAY BE MORE STRINGENT.

CREEK CROSSING IN EARTH OR LOOSE ROCK DETAIL

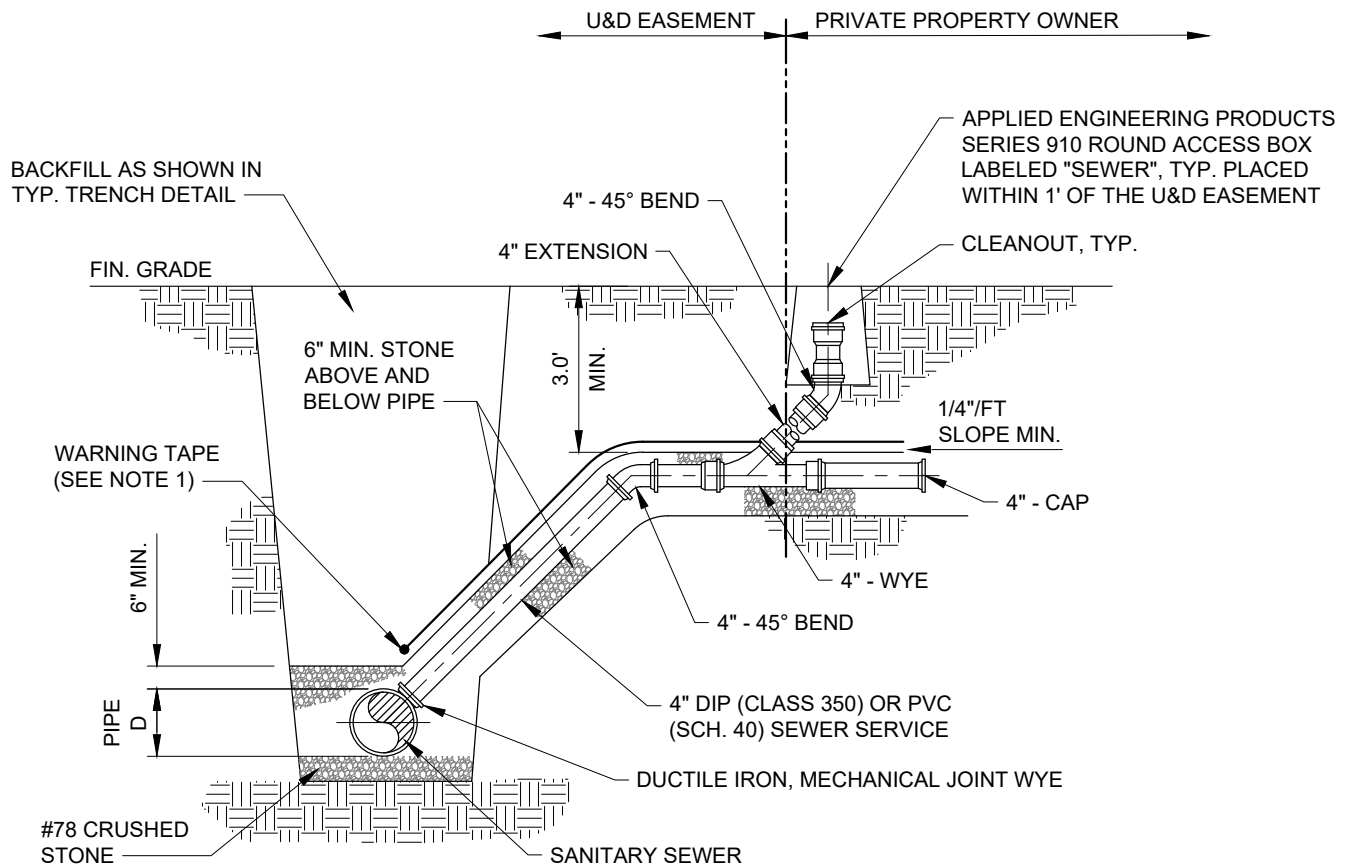
N.T.S.

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CREEK CROSSING IN EARTH OR
LOOSE ROCK DETAIL

SD-23



- NOTES:
1. ALL PVC SERVICE LATERALS SHALL HAVE WARNING TAPE BURIED DIRECTLY ABOVE THE SERVICE LATERAL AND WARNING TAPE SHALL BE PLACED WITHIN ONE (1) FOOT OF FINISHED GRADE AND SHALL BE AT LEAST 6 INCHES WIDE.
 2. A PERMANENT MARKER SHALL BE INSTALLED ON THE CURB FACE AT A POINT WHICH INTERSECTS WITH THE SERVICE LATERAL. THE CURB MARKERS SHALL BE OF THE MAKE NOTED ABOVE OR Old North State Water Company APPROVED EQUAL. CURB MARKERS SHALL BE OF THE HIGH-IMPACT PVC (LAMINATE) PLASTIC, REFLECTIVE, U.V. RESISTANT COATING.
 3. CLEANOUT SERVICE BOX SHALL BE INSTALLED BY THE SEWER CONTRACTOR WITH THE INITIAL CONSTRUCTION OF THE GRAVITY SEWER SYSTEM.

GRAVITY SERVICE LATERAL DETAIL (MORE THAN 6')

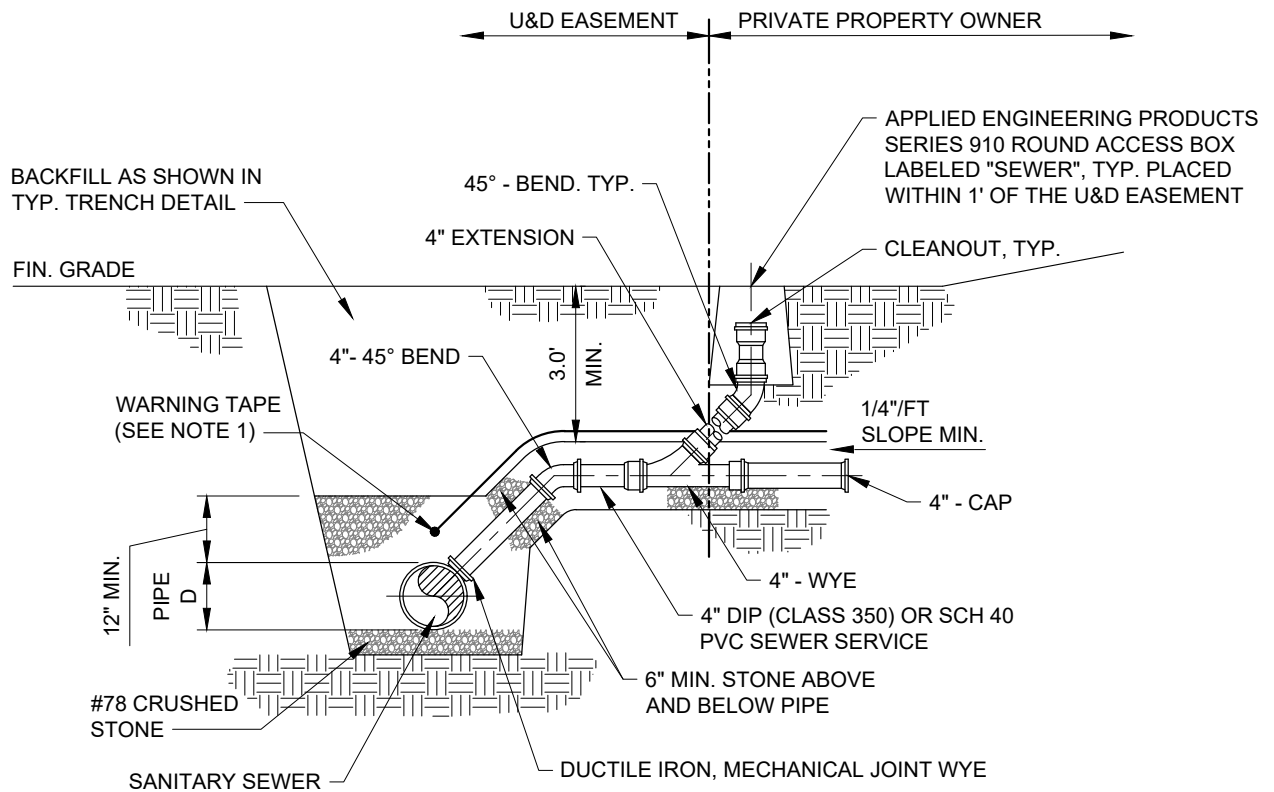
N.T.S.

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GRAVITY SERVICE LATERAL DETAIL
(MORE THAN 6 FT)

SD-25



NOTES:

1. ALL PVC SERVICE LATERALS SHALL HAVE WARNING TAPE BURIED DIRECTLY ABOVE THE SERVICE LATERAL AND WARNING TAPE SHALL BE PLACED WITHIN ONE (1) FOOT OF FINISHED GRADE AND SHALL BE AT LEAST 6 INCHES WIDE.
2. A PERMANENT MARKER SHALL BE INSTALLED ON THE CURB FACE AT A POINT WHICH INTERSECTS WITH THE SERVICE LATERAL. THE CURB MARKERS SHALL BE OF THE MAKE NOTED ABOVE OR Old North State Water Company APPROVED EQUAL. CURB MARKERS SHALL BE OF THE HIGH-IMPACT PVC (LAMINATE) PLASTIC, REFLECTIVE, U.V. RESISTANT COATING.
3. CLEANOUT SERVICE BOX SHALL BE INSTALLED BY THE SEWER CONTRACTOR WITH THE INITIAL CONSTRUCTION OF THE GRAVITY SEWER SYSTEM.

GRAVITY SERVICE LATERAL DETAIL (LESS THAN 6')

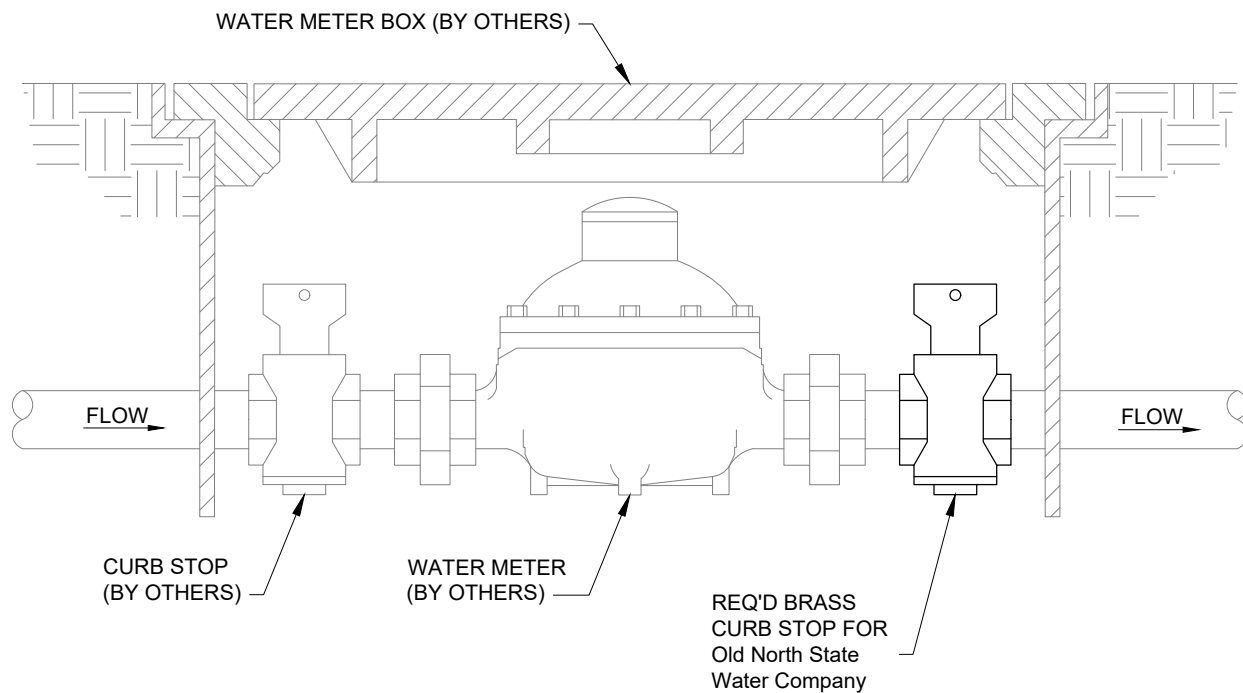
N.T.S.

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**GRAVITY SERVICE LATERAL DETAIL
(LESS THAN 6 FT)**

SD-26



- NOTES:
1. BRASS CURB STOP TO BE FORD, MUELLER, OR HAYES WITH LOCK OUT WING.
 2. Old North State Water Company CURB STOP TO BE INSTALLED ON THE CUSTOMER SIDE OF THE WATER METER AT THE TIME OF FINAL INSPECTION FOR THE HOME.
 3. Old North State Water Company CURB STOP TO REMAIN ACCESSIBLE AT ALL TIMES AND SHALL NOT BE BURIED.

CURB STOP DETAIL

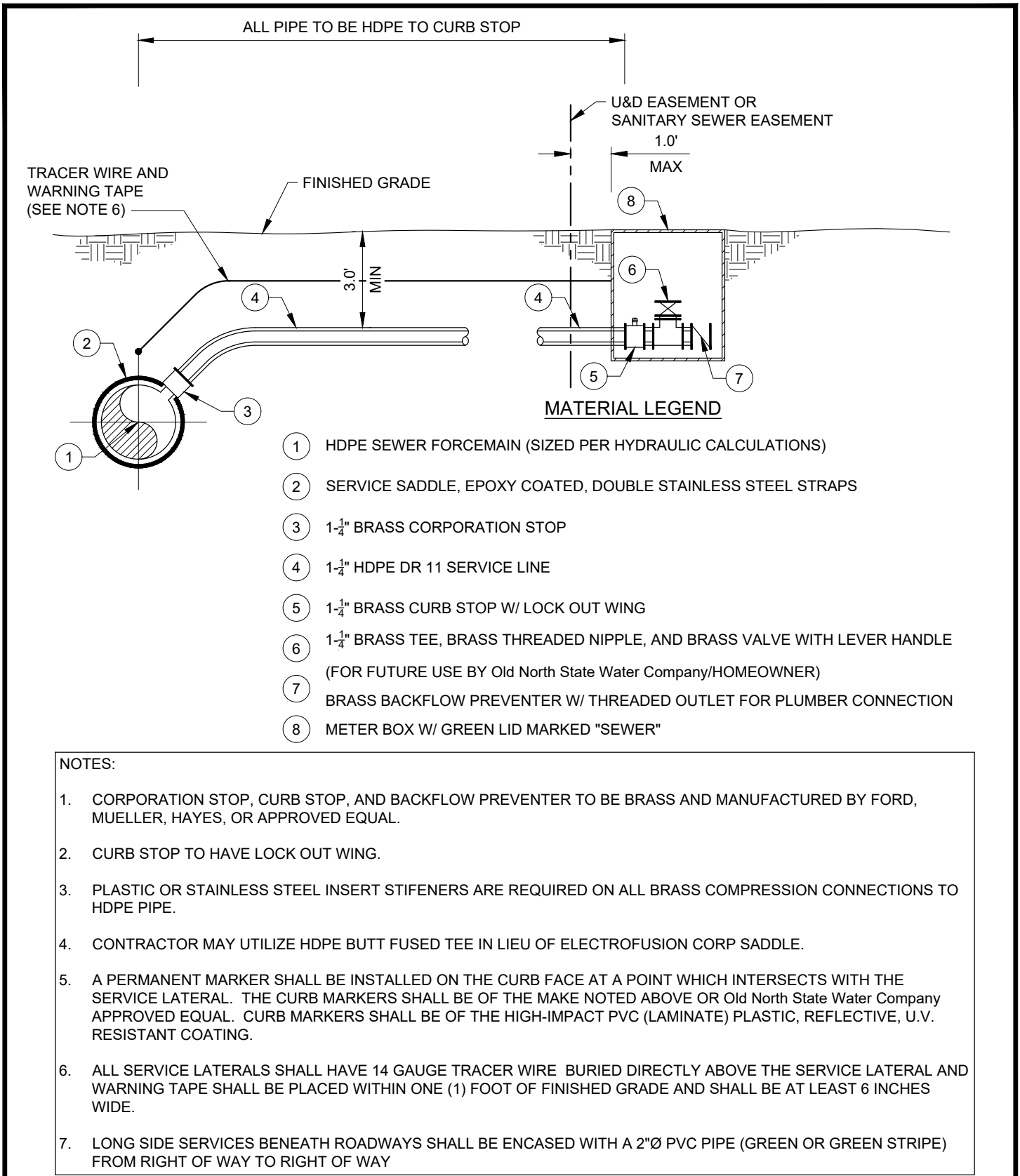
N.T.S.

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WATER SERVICE CURB STOP DETAIL

SD-27



LOW PRESSURE SEWER SERVICE LATERAL DETAIL

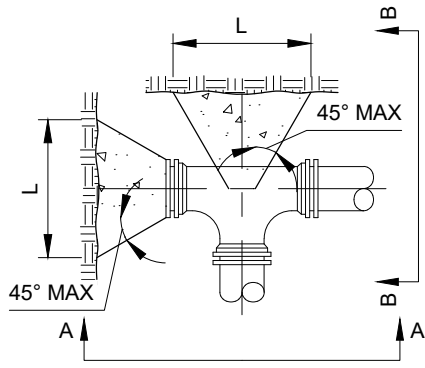
REVISED: 9/27/2020

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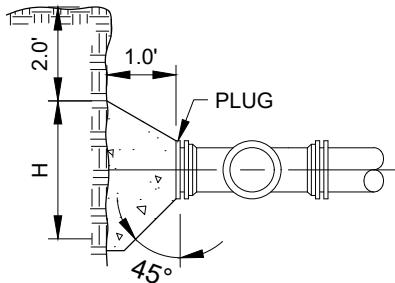


LOW PRESSURE SEWER SERVICE
LATERAL DETAIL

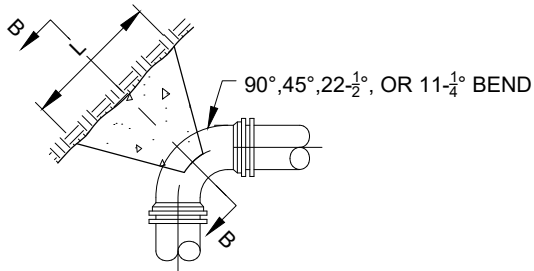
SD-28



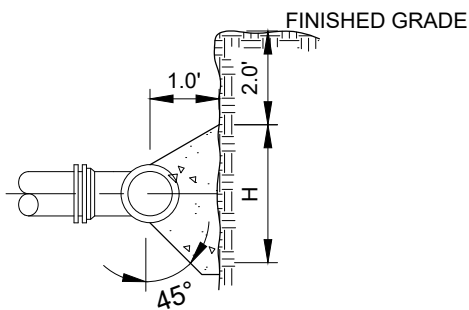
PLAN



SECTION A-A



PLAN



SECTION B-B

MINIMUM CONCRETE THRUST BLOCK DIMENSIONS			
PIPE DIA. (INCHES)	DEGREE OF BEND	L (FT.)	H (FT.)
6"	90°	2.5	2.0
	45°	2.5	1.0
	22 ½°	1.5	1.0
	11 ¼°	1.5	1.0
	TEE/PLUG	2.5	2.0
8"	90°	4.0	2.0
	45°	2.5	2.0
	22 ½°	2.5	1.0
	11 ¼°	2.0	1.0
	TEE/PLUG	4.0	2.0
12"	90°	5.0	4.0
	45°	4.0	2.5
	22 ½°	2.5	1.0
	11 ¼°	2.0	1.5
	TEE/PLUG	5.0	4.0

NOTES:

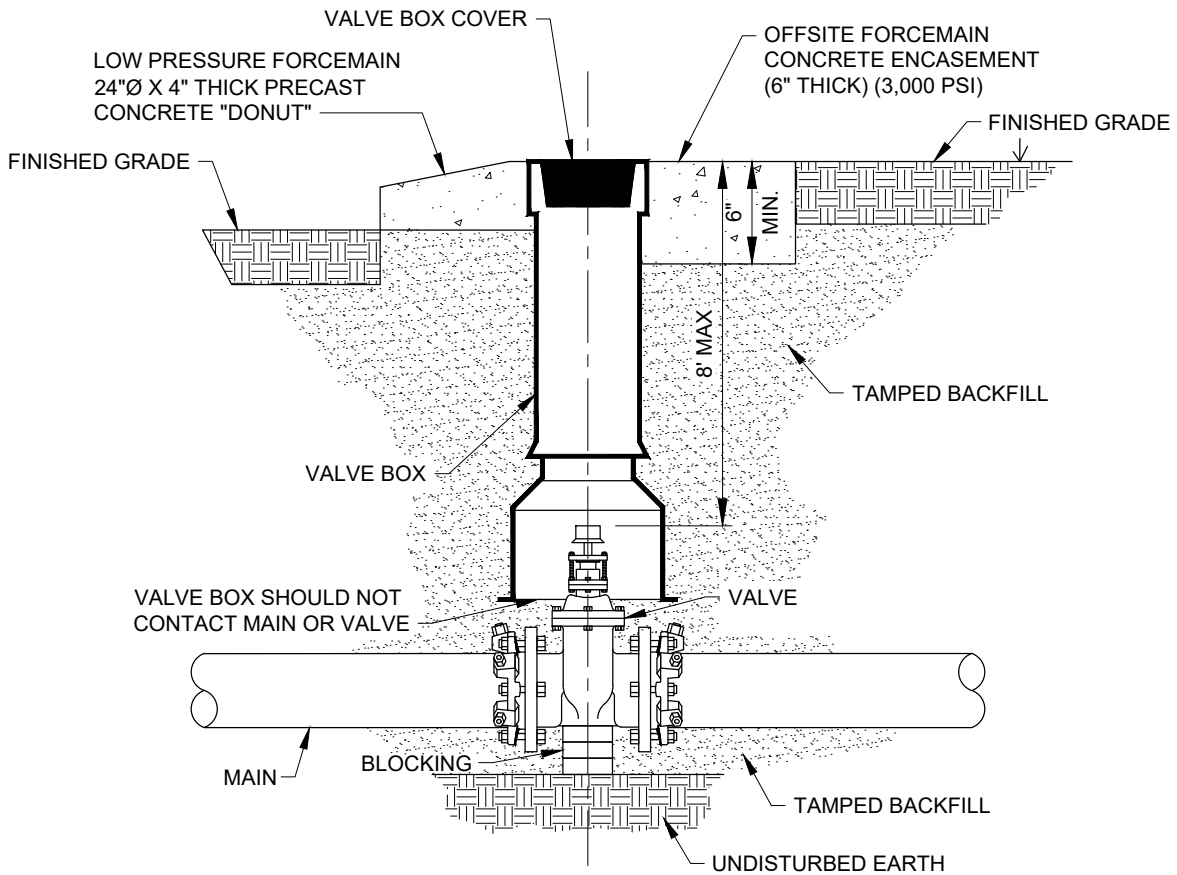
1. CONCRETE SHALL HAVE 4,000 PSI STRENGTH AT 28 DAYS.
2. THE VALUES IN THE TABLE ARE BASED ON 2,000 PSF SOIL BEARING CAPACITY AND 150 PSI WORKING PRESSURE.
3. THRUST BLOCK DESIGN FOR OTHER DESIGN CIRCUMSTANCES OR PIPE LARGER THAN 12" SHALL BE REVIEWED ON AN INDIVIDUAL BASIS BY THE ENGINEER.
4. HEIGHT OF CONCRETE THRUST BLOCK ABOVE THE PIPE CENTERLINE IS 1/3 THE H DIMENSION.
5. PROVIDE A 10 MIL PLASTIC BARRIER BETWEEN CONCRETE AND PIPE. OBTAIN INSPECTOR'S APPROVAL PRIOR TO PLACEMENT OF CONCRETE.
6. CONCRETE FOR THRUST BLOCK TO BE POURED AGAINST UNDISTURBED EARTH.

CONCRETE KICKER DETAIL

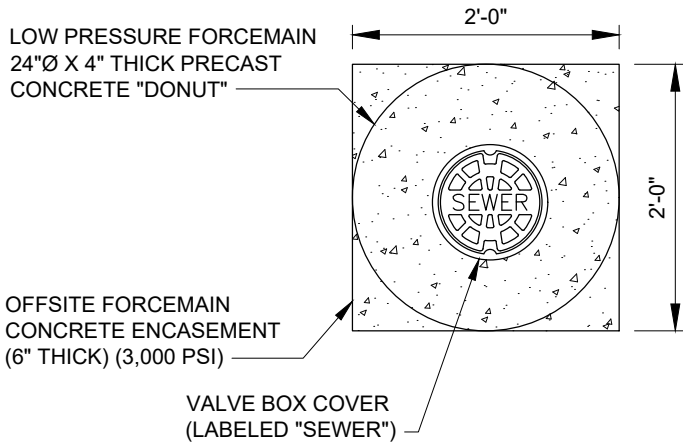
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SECTION



PLAN

NOTES

1. ONLY MANUFACTURED VALVE BOX EXTENSIONS SHALL BE ALLOWED.
2. VALVE OPERATING NUT MUST BE EXTENDED SO THAT THE DEPTH IS NO GREATER THAN 8' (FT.) FROM THE SURFACE USING A MANUFACTURER APPROVED EXTENSION KIT.
3. CONCRETE, BACKFILL, VALVE BOX, AND COVER ARE CONSIDERED SUBSIDIARY TO THE VALVE.
4. VALVE BOX AND CONCRETE TO MEET HS-20 LOAD RESTRICTION.

VALVE BOX DETAIL

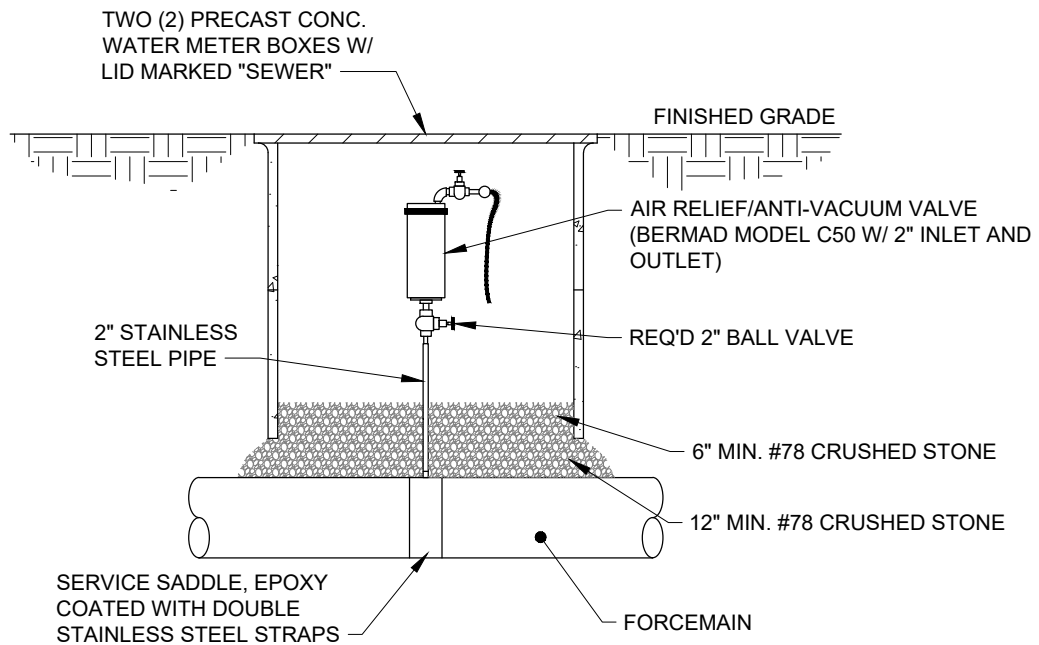
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VALVE BOX DETAIL

SD-30



**AIR RELIEF VALVE ASSEMBLY DETAIL
(LOW PRESSURE FORCEMAIN)**

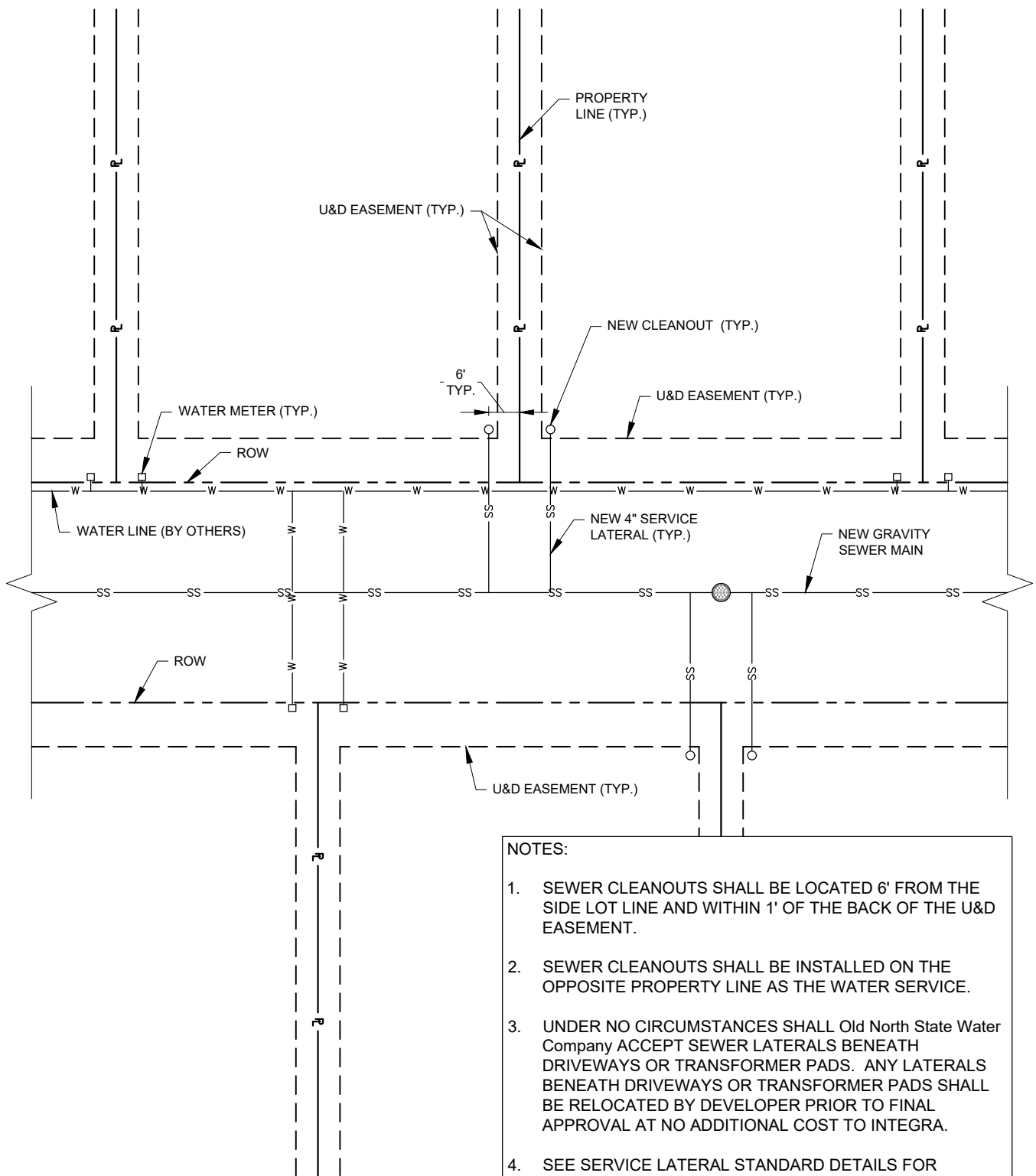
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REVISED: 9/27/2020



**AIR RELIEF VALVE ASSEMBLY DETAIL
(LOW PRESSURE FORCEMAIN)**

SD-31



- NOTES:
1. SEWER CLEANOUTS SHALL BE LOCATED 6' FROM THE SIDE LOT LINE AND WITHIN 1' OF THE BACK OF THE U&D EASEMENT.
 2. SEWER CLEANOUTS SHALL BE INSTALLED ON THE OPPOSITE PROPERTY LINE AS THE WATER SERVICE.
 3. UNDER NO CIRCUMSTANCES SHALL Old North State Water Company ACCEPT SEWER LATERALS BENEATH DRIVEWAYS OR TRANSFORMER PADS. ANY LATERALS BENEATH DRIVEWAYS OR TRANSFORMER PADS SHALL BE RELOCATED BY DEVELOPER PRIOR TO FINAL APPROVAL AT NO ADDITIONAL COST TO INTEGRA.
 4. SEE SERVICE LATERAL STANDARD DETAILS FOR LATERAL CROSS SECTIONS.

GRAVITY SERVICE LATERAL LAYOUT DETAIL

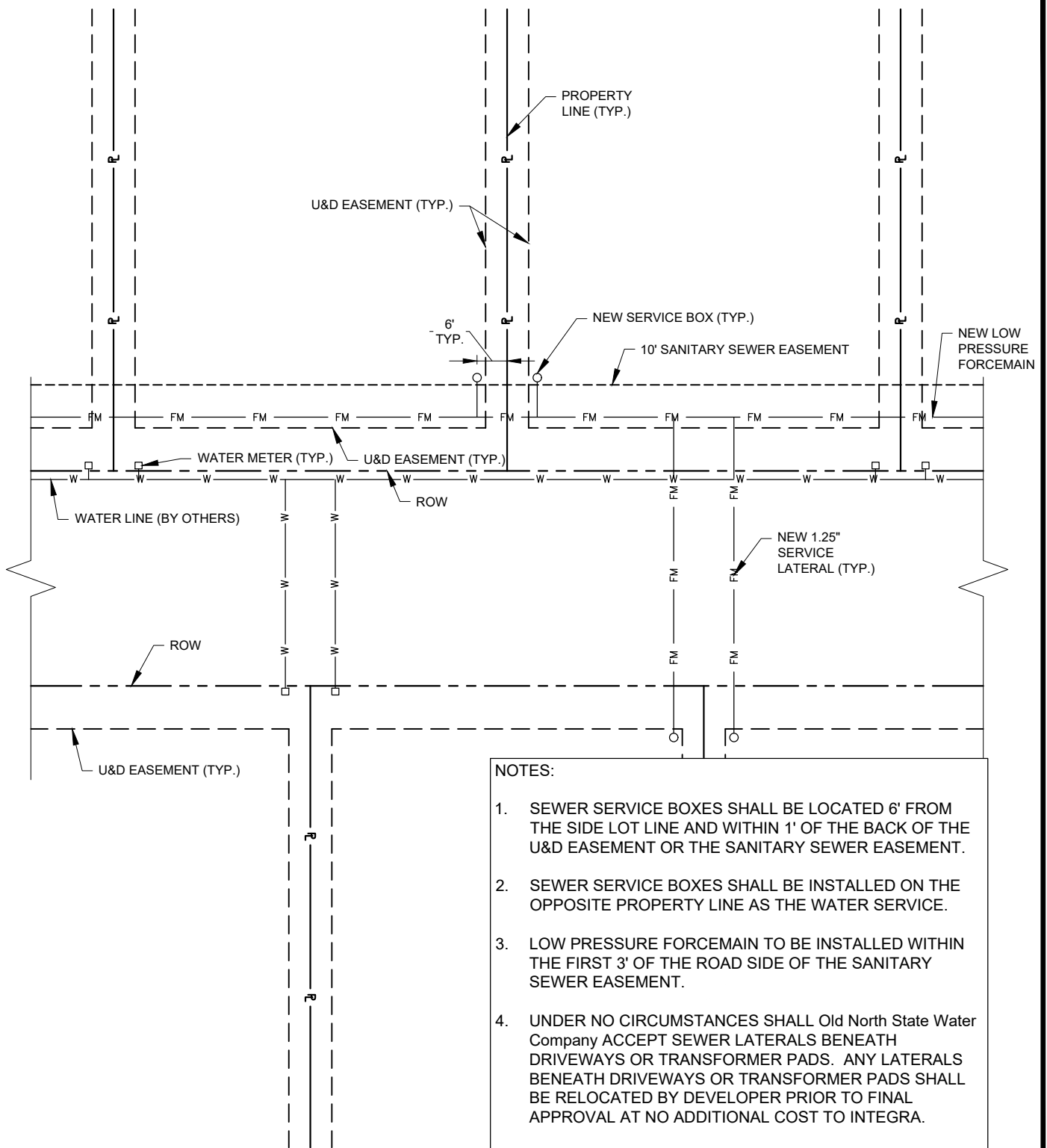
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REVISED: 9/27/2020



GRAVITY SERVICE LATERAL LAYOUT
DETAIL

SD-32



- NOTES:
1. SEWER SERVICE BOXES SHALL BE LOCATED 6' FROM THE SIDE LOT LINE AND WITHIN 1' OF THE BACK OF THE U&D EASEMENT OR THE SANITARY SEWER EASEMENT.
 2. SEWER SERVICE BOXES SHALL BE INSTALLED ON THE OPPOSITE PROPERTY LINE AS THE WATER SERVICE.
 3. LOW PRESSURE FORCEMAIN TO BE INSTALLED WITHIN THE FIRST 3' OF THE ROAD SIDE OF THE SANITARY SEWER EASEMENT.
 4. UNDER NO CIRCUMSTANCES SHALL Old North State Water Company ACCEPT SEWER LATERALS BENEATH DRIVEWAYS OR TRANSFORMER PADS. ANY LATERALS BENEATH DRIVEWAYS OR TRANSFORMER PADS SHALL BE RELOCATED BY DEVELOPER PRIOR TO FINAL APPROVAL AT NO ADDITIONAL COST TO INTEGRA.
 5. SEE SERVICE LATERAL STANDARD DETAILS FOR LATERAL CROSS SECTIONS.

LOW PRESSURE SERVICE LATERAL LAYOUT DETAIL

N.T.S.

REVISED: 9/27/2020



LOW PRESSURE SERVICE LATERAL
LAYOUT DETAIL

SD-33