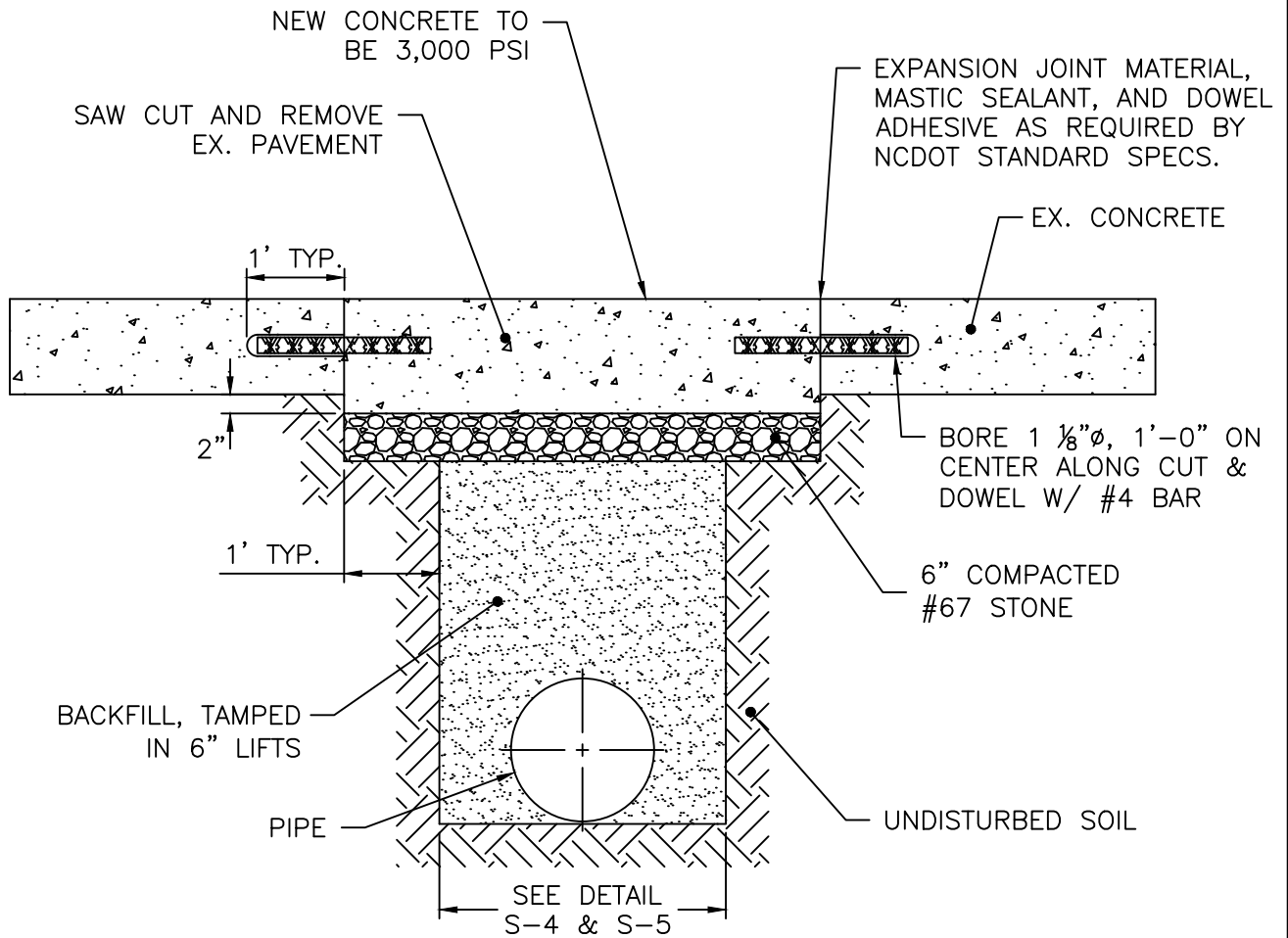


STANDARD SEWER DETAILS

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-



NOTES:

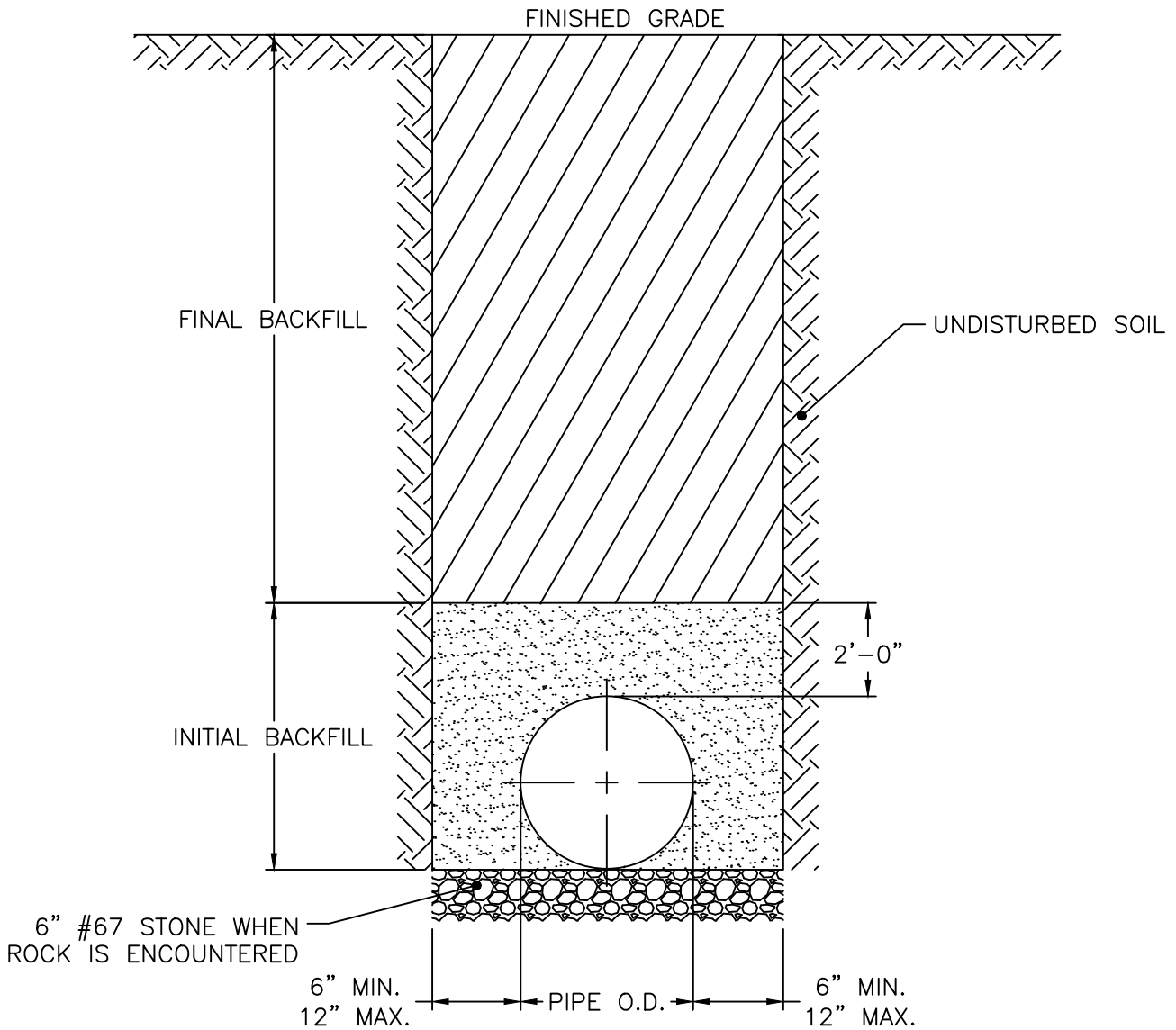
1. SEE DETAIL S-4 & S-5 FOR ADDITIONAL TRENCH AND PIPE BEDDING DETAILS.
2. PAVEMENT CUTS OVER 5'-0" IN WIDTH SHALL BE REINFORCED TO NCDOT OR MERGER COMMUNITY STANDARDS.
3. PAVEMENT CUTS SHALL BE MADE WITH AN APPROPRIATE SAW CUT MACHINE.
4. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T 99 AS MODIFIED BY NCDOT.
5. THE FINAL 6" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO AT LEAST 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T 180 AS MODIFIED BY NCDOT.

CITY OF RALEIGH		
STANDARD DETAIL		
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	STANDARD CONCRETE PAVEMENT PATCH	
	S-2	

SEE TRANSPORTATION DETAIL
T-10.05.1 FOR ASPHALT REPAIR

SEE TRANSPORTATION DETAIL
T-10.05.2 FOR ASPHALT REPAIR EXTENTS

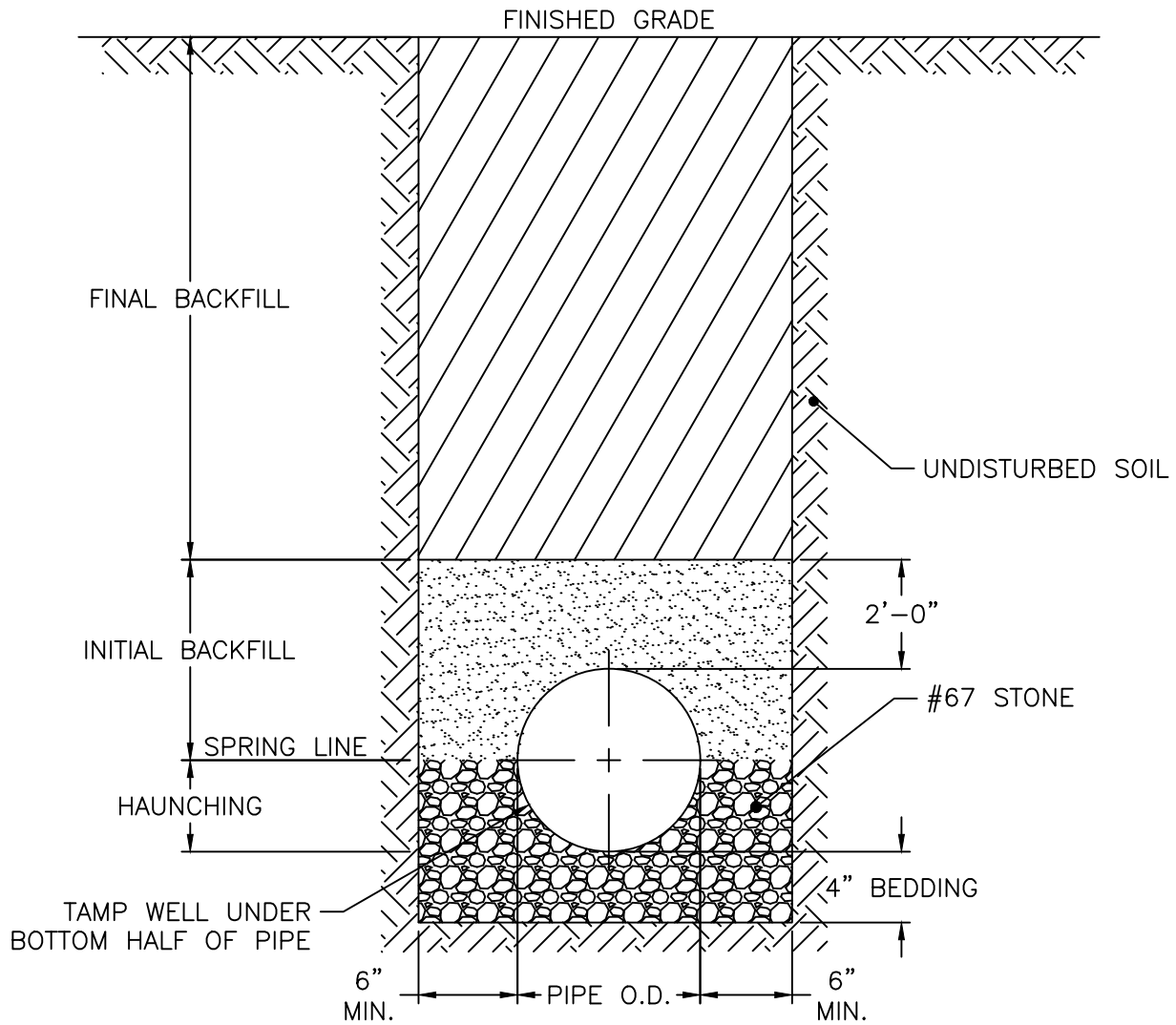
CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
	STANDARD ASPHALT PAVEMENT PATCH	
	S-3	



NOTES:

1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
5. ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
6. IF IN EASEMENT, 4" TOPSOIL AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
7. NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH		
STANDARD DETAIL		
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	TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON	
S-4		



TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

NOTES:

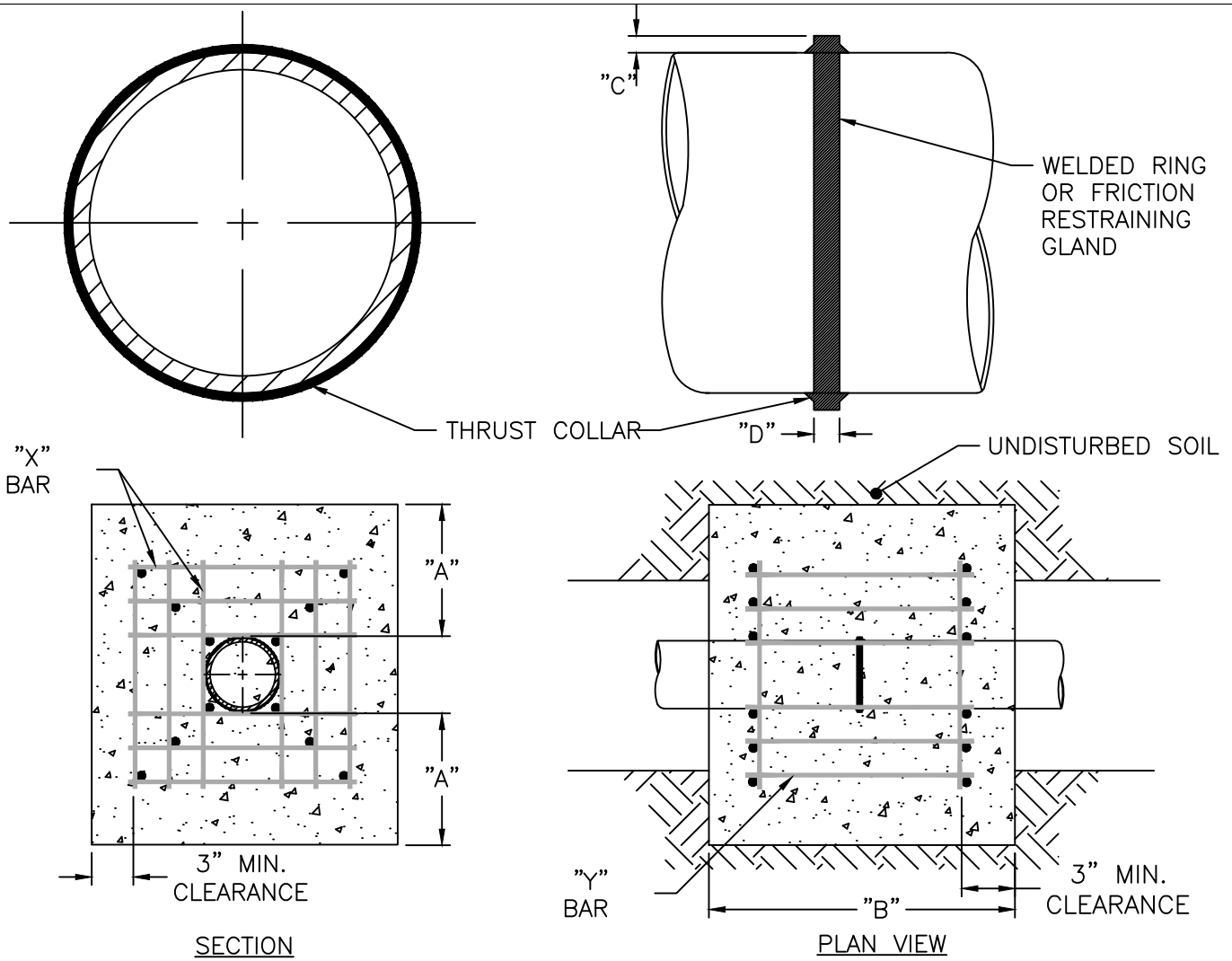
1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS, 4" OR LARGER, TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS DATE: 01/18/2025 NOT TO SCALE

TRENCH BOTTOM DIMENSIONS &
BACKFILLING REQUIREMENTS FOR
PVC GRAVITY SEWER MAIN

S-5



REINFORCING REQUIREMENTS

THRUST COLLAR, AND THRUST SCHEDULE

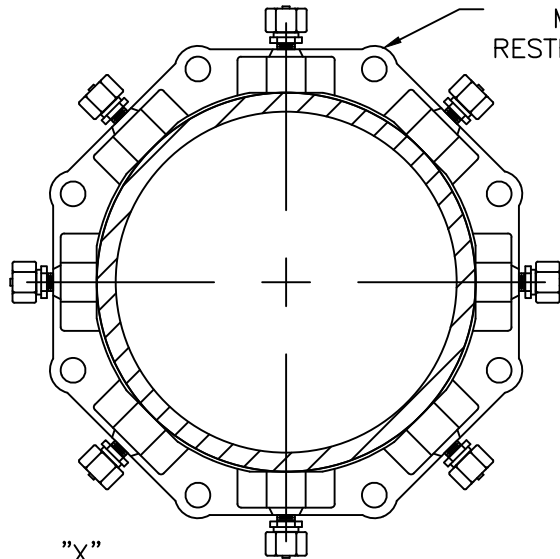
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6"-36"	#5	2'-2" + O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24 Y-12
≥48"	#6	3'-0" + O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24 Y-12

I.D. PIPE	"A"	"B"	"C"	"D"
6"-16"	1'-4"	1'-7"	2"	3/8"
20"-24"	1'-4"	1'-7"	3"	1/2"
30"-36"	1'-4"	1'-7"	4"	5/8"
≥48"	1'-8"	1'-9"	6"	7/8"

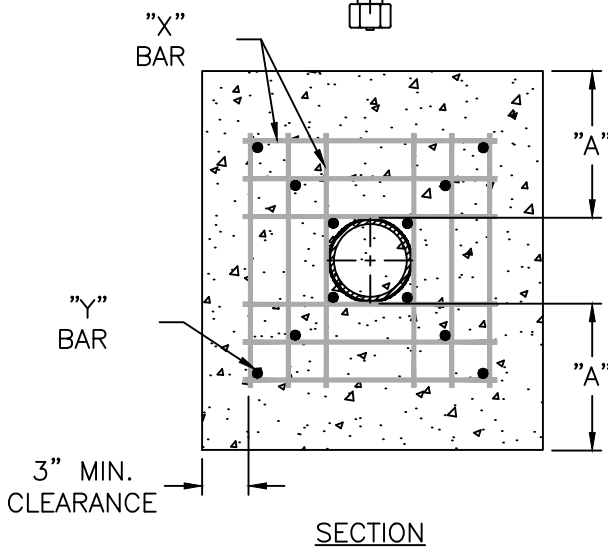
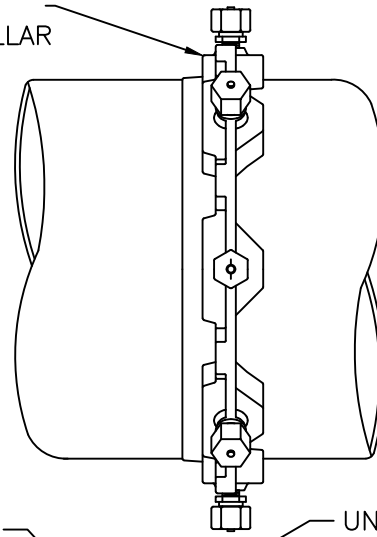
NOTES:

1. CONCRETE SHALL BE 3,000 PSI AND TRANSIT MIXED.
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON DETAIL S-4 & S-5.
4. BACKFILL TAMPED IN 6" LIFTS, SEE DETAIL S-4 & S-5.
5. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.
6. IN LIEU OF WELDED RING, FRICTION RESTRAINING GLANDS ARE PERMITTED.

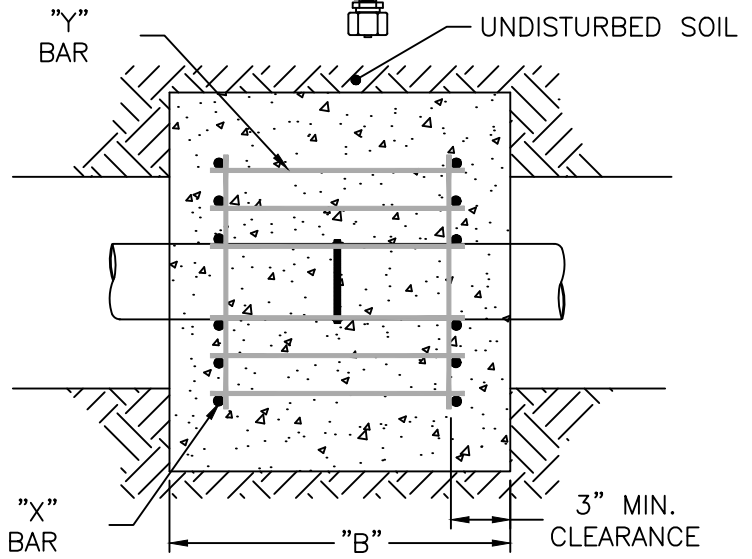
CITY OF RALEIGH	
STANDARD DETAIL	
REVISIONS	DATE: 01/18/2025 NOT TO SCALE
	RESTRAINING COLLAR DESIGN DATA FOR SEWER FORCE MAIN
	S-6



MECHANICAL RESTRAINING COLLAR



SECTION



PLAN VIEW

REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6"-36"	#5	2'-2" + O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24 Y-12
≥48"	#6	3'-0" + O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24 Y-12

THRUST COLLAR, AND THRUST SCEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6"-16"	1'-4"	1'-7"	2"	3/8"
20"-24"	1'-4"	1'-7"	3"	1/2"
30"-36"	1'-4"	1'-7"	4"	5/8"
≥48"	1'-8"	1'-9"	6"	7/8"

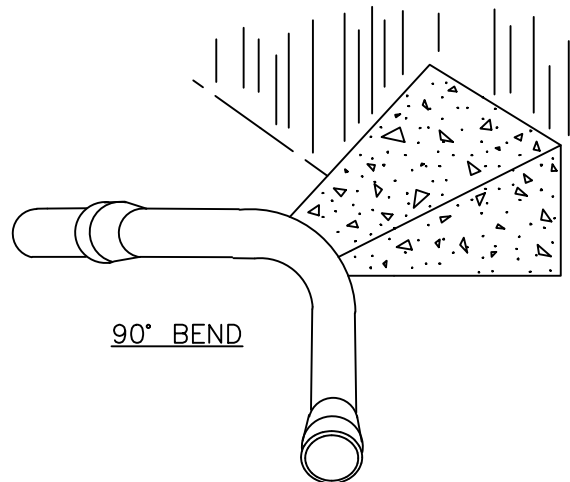
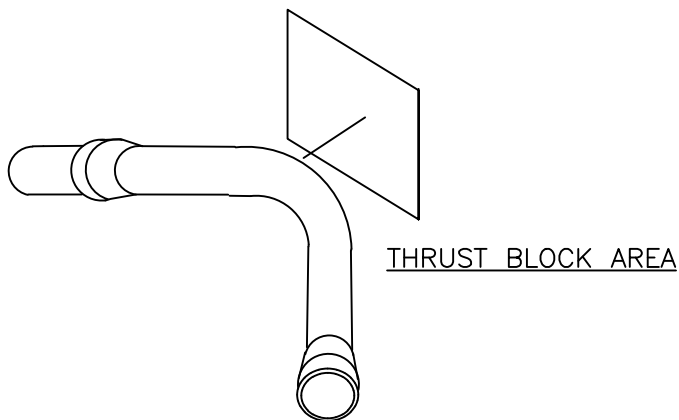
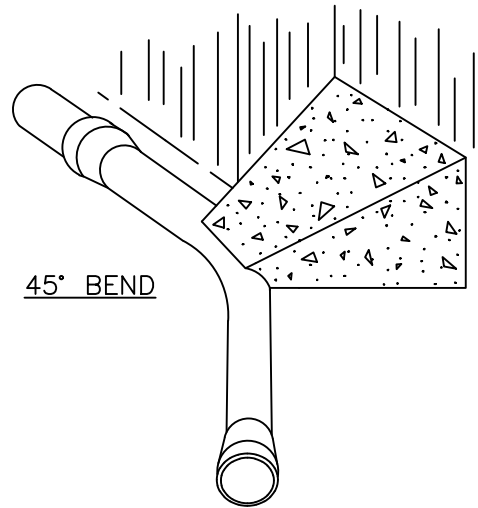
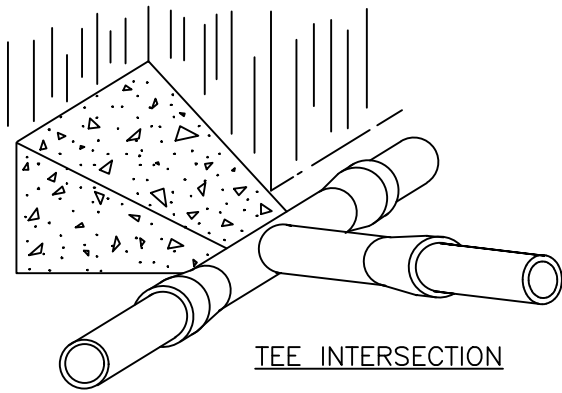
NOTES:

1. CONCRETE SHALL BE 3,000 PSI AND TRANSIT MIXED.
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON DETAIL S-5.
4. BACKFILL TAMPED IN 6" LIFTS, SEE DETAIL S-4 & S-5.
5. MECHANICAL RESTRAINING COLLAR SHALL BE AS MANUFACTURED BY MEGA-LUG OR EQUAL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
RESTRAINING COLLAR DESIGN DATA FOR PVC FORCE MAINS		
S-6A		

THRUST BLOCKING



NOTES:

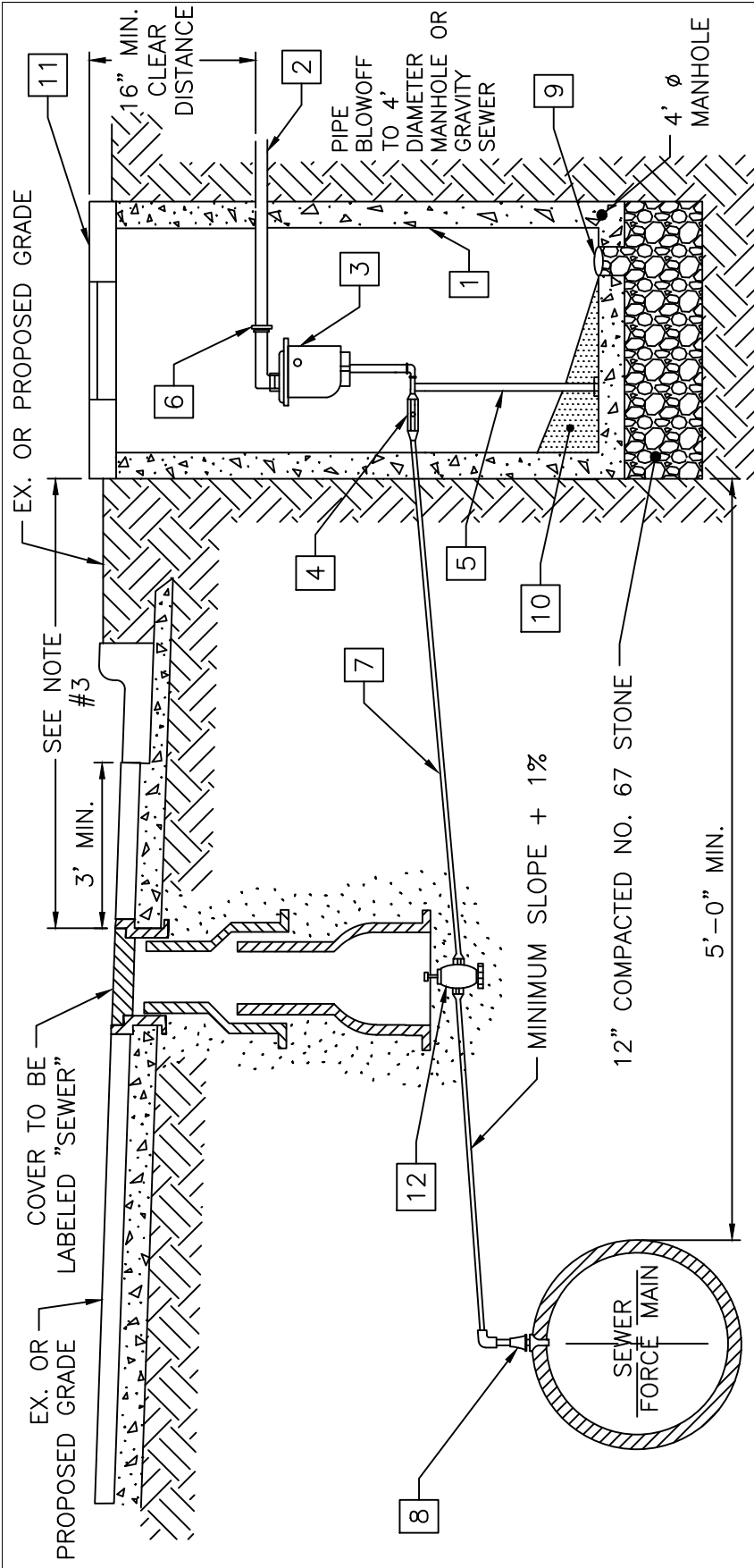
1. CONCRETE SHALL BE 3,000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO DETAIL S-4 & S-5.
4. SEE DETAIL W-10 & W-11 (THRUST BLOCK TABLES) FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
STANDARD DETAIL

<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
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THRUST
BLOCKING VIEWS

S-7



NOTES:

1. AIR RELEASE/VACUUM VALVE TO BE A.R.I. FLOW CONTROL MODEL SAAR SHORT VERSION D-025 SS (STAINLESS STEEL).
2. THE AIR RELEASE MANHOLE SHALL BE INSTALLED IN THE SHOULDER OR AS DIRECTED BY THE ENGINEER.
3. FORCE MAINS LOCATED OUTSIDE OF STREET RIGHT-OF-WAYS THE MAXIMUM DISTANCE BETWEEN THE MANHOLE AND THE VALVE BOX SHOULD BE THREE (3) FEET.
4. MAIN SHALL BE DEEP ENOUGH TO ACCOMMODATE INSTALLATION AS SHOWN.
5. SEE DETAIL S-4 & S-5 TO INSURE PROPER BACKFILL.

BILL OF MATERIALS

1	PRECAST MANHOLE W/ FLAT TOP
2	BLOW OFF PIPE SCD 80 PVC
3	2" AIR RELEASE VALVE
4	2"-SS BALL VALVE
5	PIPE STAND SUPPORT SS
6	2" UNION SCD 80 PVC
7	2" TYPE "K", SOFT COPPER WITH FLARED ELBOW
8	CORPORATION COCK
9	6" DIAMETER DRAIN
10	GROUT, 1/8" TO 1'-0" MIN. SLOPE TO DRAIN
11	36" x 30" HALLIDAY HATCH, ALUM.
12	2" GATE VALVE

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
SEWER FORCE MAIN AIR RELEASE VALVE		
S-9		

AERIAL PIPE CROSSING GENERAL NOTES:

1. ALL MATERIALS UTILIZED ON THESE DETAIL SHEETS SHALL CONFORM TO THE APPROPRIATE SECTIONS OF THE CITY OF RALEIGH PUBLIC UTILITIES HANDBOOK UNLESS NOTED OTHERWISE HEREIN.

2. RESTRAINED JOINT PIPE AND FITTINGS SHALL CONSIST OF BOLTED RETAINER RINGS AND WELDED RETAINER BARS OR BOLTLESS TYPE WHICH INCLUDE DUCTILE IRON LOCKING SEGMENTS AND RUBBER RETAINERS. BOLTS FOR RESTRAINED JOINTS (IF APPLICABLE) SHALL CONFORM TO ANSI B18.2. RESTRAINED PIPE AND FITTINGS SHALL BE FLEX-RING OR LOK-RING TYPE JOINTS AS MANUFACTURED BY AMERICAN CAST IRON PIPE CO.; TR FLEX AS MANUFACTURED BY US PIPE, SUPER-LOCK AS MANUFACTURED BY CLOW, BOLT-LOK OR SNAP-LOK AS MANUFACTURED BY GRIFFIN PIPE PRODUCTS, OR EQUAL.

3. CONCRETE PROPERTIES SHALL BE AS FOLLOWS:
- A. CONCRETE COMPRESSIVE STRENGTH = 4,000 PSI
 - B. NOMINAL SLUMP = 4 INCHES
 - C. WATER/CEMENTITIOUS MATERIALS RATIO = 0.45 (MAX)
 - D. AIR CONTENT = 6% * 1.5%

CONCRETE SHALL BE COMPOSED OF CEMENT, WATER, COARSE AGGREGATES, FINE AGGREGATES AND AIR. CEMENT SHALL BE TYPE I/II OR II IN ACCORDANCE WITH ASTM C-150. MATERIAL REQUIREMENTS FOR ALL FINE AND COARSE AGGREGATES SHALL CONFORM TO ASTM C-33. COARSE AGGREGATE SHALL BE SIZE No. 57 OR 67. AN APPROVED CLASS 'F' FLYASH MAY BE SUBSTITUTED FOR AN EQUAL AMOUNT OF CEMENT BY WEIGHT UP TO 25%.

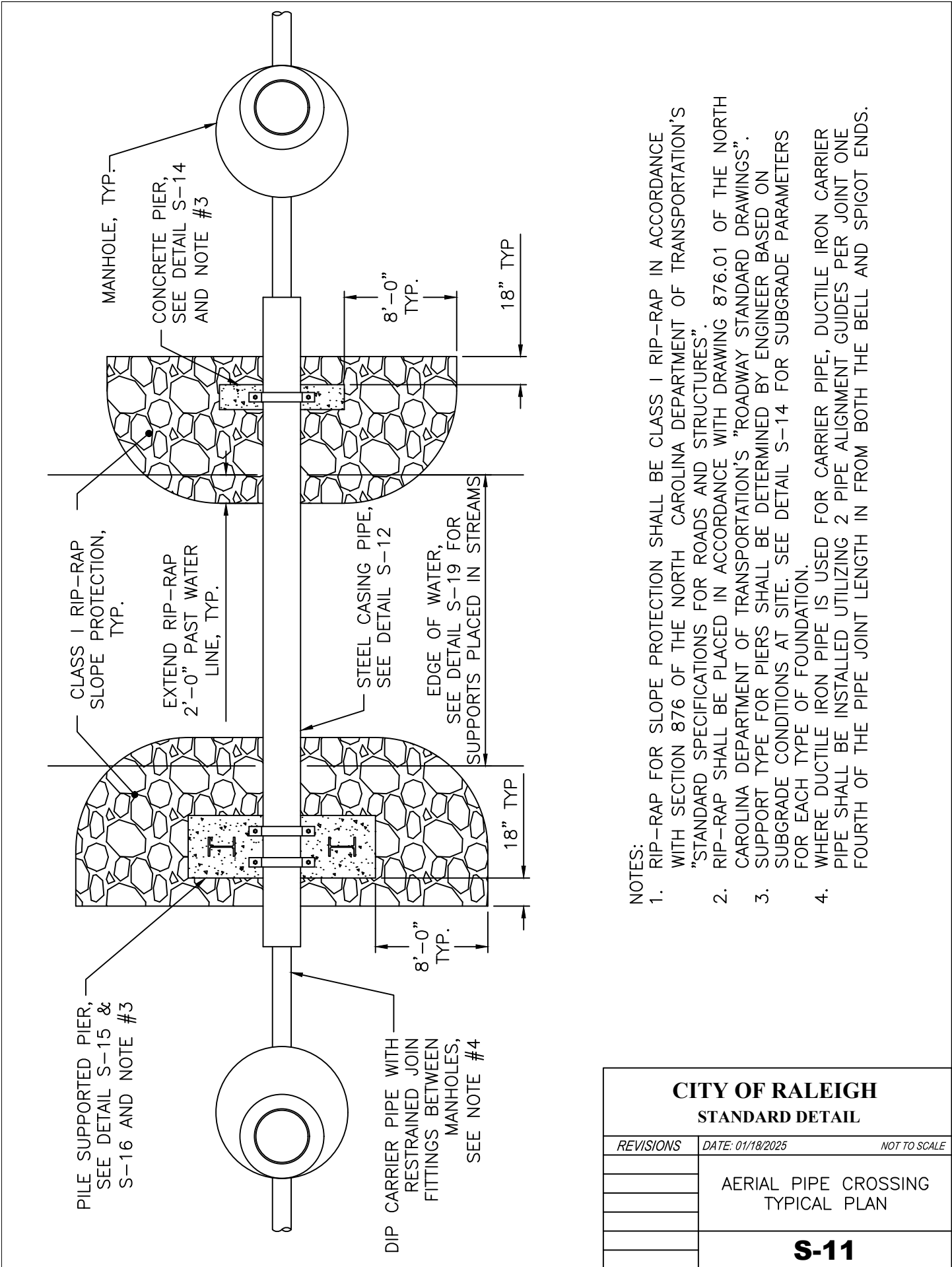
4. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED $\frac{3}{4}$ ".

5. CONVENTIONAL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 AND SHALL BE PLACED IN ACCORDANCE WITH "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS" (LATEST EDITION) AS PUBLISHED BY THE CONCRETE REINFORCING INSTITUTE. SPLICES SHALL BE CLASS 'B' CONFORMING TO THE PROVISIONS OF ACI 318 - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".

6. NEOPRENE BEARING PADS SHALL BE FORMED FROM PREVIOUSLY UNVULCANIZED, 100% VIRGIN NEOPRENE, WITH DUROMETER HARDNESS = 50.

7. PILES SHALL BE STRUCTURAL STEEL HP12x53 PILES AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36. PILES SHALL BE DRIVEN TO DEPTHS REQUIRED TO OBTAIN AN ULTIMATE BEARING CAPACITY OF NOT LESS THAN TWO TIMES THE DESIGN LOADING OF 30 TONS. PILES SHALL PENETRATE A MINIMUM OF FIFTEEN FEET INTO UNDISTURBED SOIL. IN DRIVING PILES, A METHOD APPROVED BY THE ENGINEER SHALL BE USED WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED. IF REQUESTED BY THE ENGINEER, PILES SHALL BE TESTED TO DETERMINE THE ULTIMATE CAPACITY OF THE PILES. THE METHOD OF LOAD TESTING SHALL CONFORM TO ASTM D1143 AND THE NORTH CAROLINA STATE BUILDING CODE. WHERE PILES ARE EXPOSED, PILES SHALL BE PAINTED AND/OR COATED IN ACCORDANCE WITH THE CITY SPECIFICATIONS.

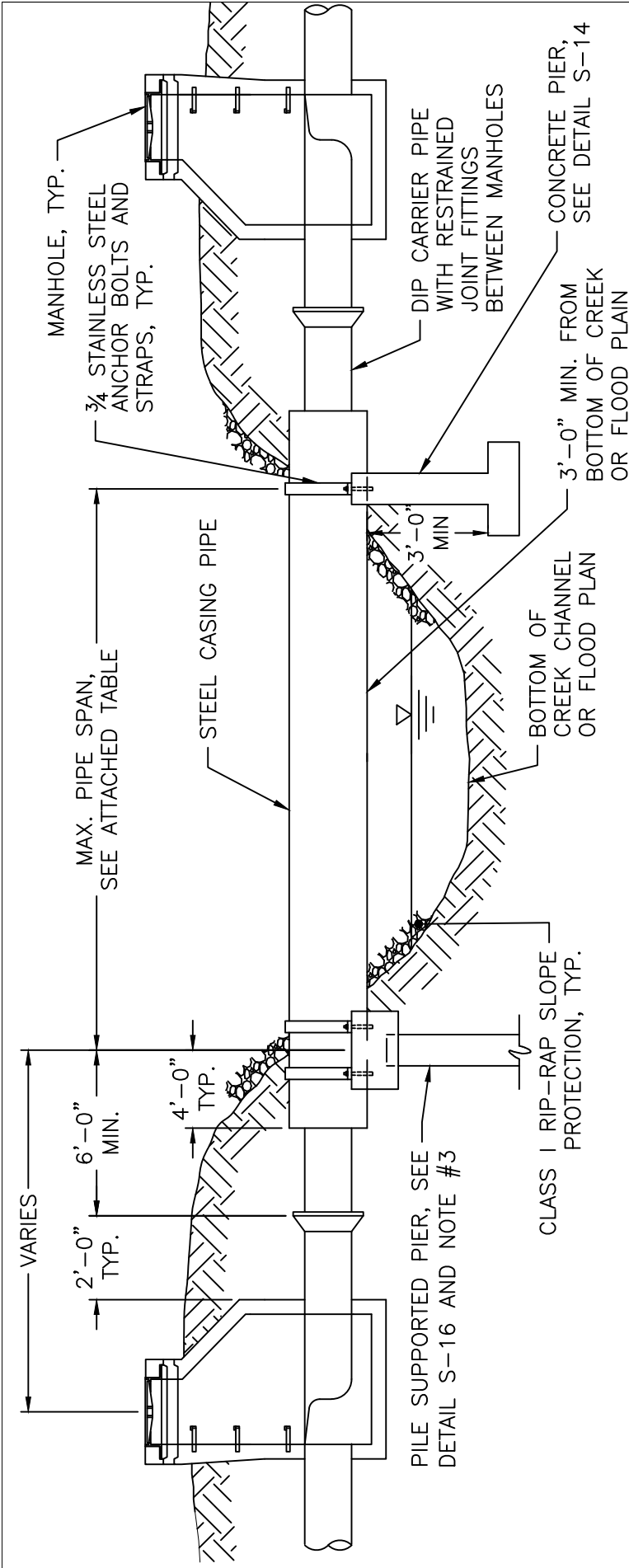
CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
	AERIAL PIPE CROSSING GENERAL NOTES	
	S-10	



NOTES:

1. RIP-RAP FOR SLOPE PROTECTION SHALL BE CLASS I RIP-RAP IN ACCORDANCE WITH SECTION 876 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES".
2. RIP-RAP SHALL BE PLACED IN ACCORDANCE WITH DRAWING 876.01 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S "ROADWAY STANDARD DRAWINGS".
3. SUPPORT TYPE FOR PIERS SHALL BE DETERMINED BY ENGINEER BASED ON SUBGRADE CONDITIONS AT SITE. SEE DETAIL S-14 FOR SUBGRADE PARAMETERS FOR EACH TYPE OF FOUNDATION.
4. WHERE DUCTILE IRON PIPE IS USED FOR CARRIER PIPE, DUCTILE IRON CARRIER PIPE SHALL BE INSTALLED UTILIZING 2 PIPE ALIGNMENT GUIDES PER JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH		
STANDARD DETAIL		
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	AERIAL PIPE CROSSING TYPICAL PLAN	
S-11		



NOTES:

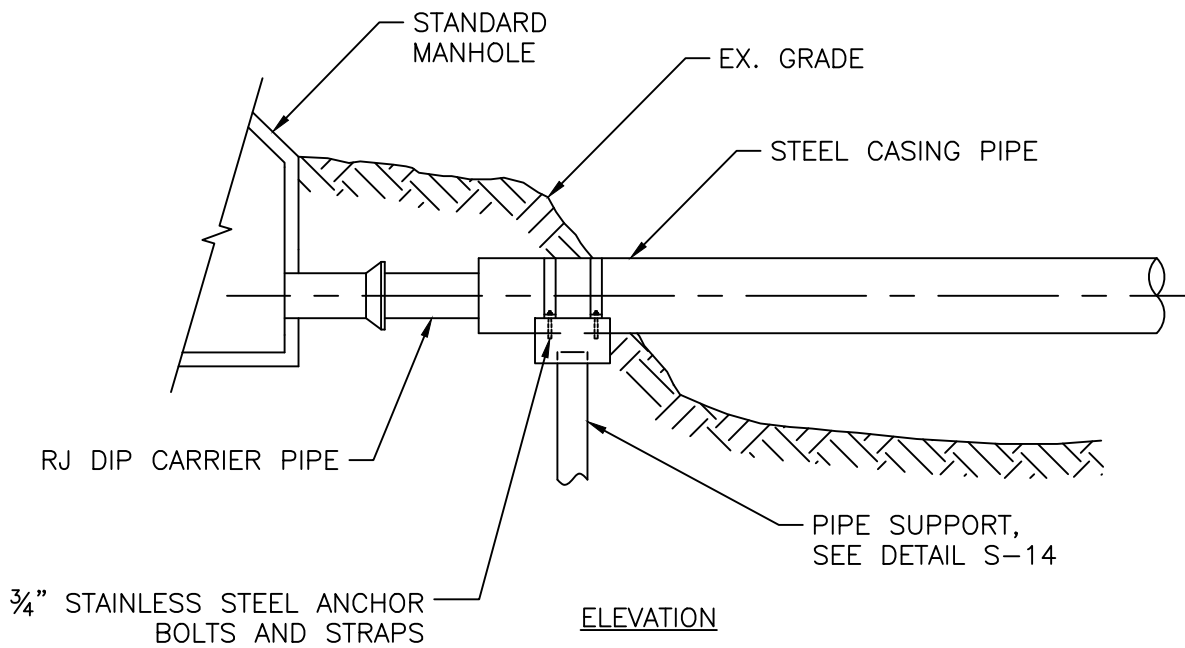
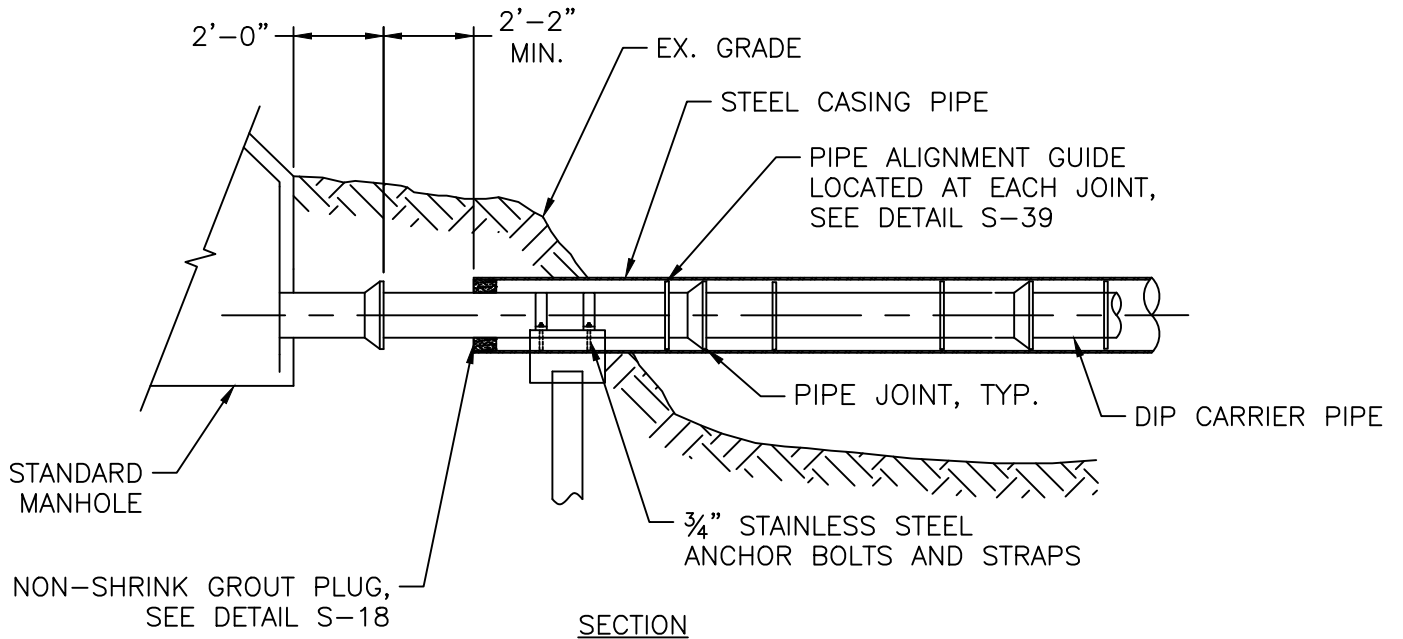
1. STEEL PIPE SHALL BE EITHER SPIRAL WELDED OR SMOOTH WALL SEAMLESS WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI. PAINTING AND LINING SHALL BE AS REQUIRED BY THE CITY OF RALEIGH PUBLIC UTILITIES HANDBOOK.
2. DUCTILE IRON PIPE SHALL BE SUPPORTED WITH TWO SPIDERS AT EVERY JOINT WITHIN THE CASING PIPE USING APPROVED PIPE ALIGNMENT GUIDE. SEE DETAIL S-39. ALL JOINTS SHALL BE RESTRAINED JOINT. SEE NOTE #2 ON DETAIL S-10.
3. SUPPORT TYPE FOR PIERS SHALL BE DETERMINED BY ENGINEER BASED ON SUBGRADE CONDITIONS AT SITE. SEE DETAIL S-14 FOR SUBGRADE PARAMETERS FOR EACH TYPE OF FOUNDATION. SEE DETAIL S-19 FOR SUPPORTS PLACED WITHIN STREAM.
4. BOTTOM OF PIPE TO BE AT A MINIMUM OF 1' ABOVE THE 25 YEAR FLOOD ELEVATION.

ALLOWABLE SPANS FOR STEEL CASING PIPE

CARRIER PIPE, DIP DIAMETER (IN.)	CASING PIPE, STEEL DIAMETER (IN.)	MIN. CASING PIPE WALL THICKNESS (IN.)	ALLOWABLE SPAN (FT.)
6	14	0.3750	40
8	16	0.3750	45
10	18	0.3750	50
12	20	0.3750	50
14	24	0.3750	55
16	26	0.3750	55
18	30	0.3750	60
20	32	0.3750	60
24	36	0.4375	65
30	42	0.4375	65
36	48	0.5000	65
42	56	0.5000	65

CITY OF RALEIGH
STANDARD DETAIL

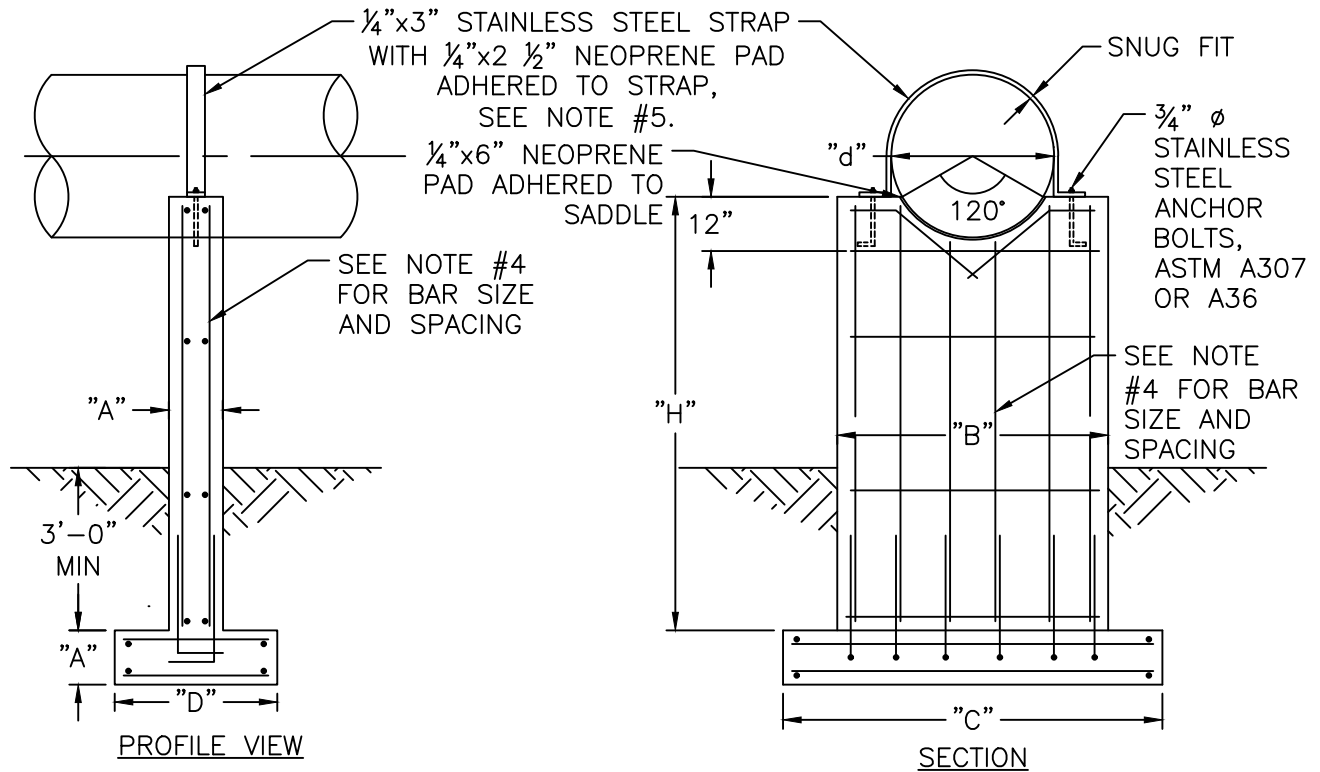
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
AERIAL PIPE CROSSING STEEL CASING PIPE ELEVATION		
S-12		



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
S-13		

AERIAL PIPE CROSSING
TYPICAL PIPE SECTION
AND ELEVATION



CASING PIPE DIA. "d" (IN.)	"H" (FT.)	THICKNESS "A" (IN.)	PIER WIDTH "B"	FOOTING LENGTH "C"	FOOTING WIDTH "D"
6-12	≤6	12	2'-4"	5'-6"	3'-0"
	8	12		6'-3"	
	10	12		6'-8"	
	12	12		7'-2"	
14-20	≤6	12	3'-0"	8'-0"	3'-0"
	8	12		9'-0"	
	10	12		9'-10"	
	12	14		10'-6"	
22-28	≤6	14	3'-8"	8'-9"	4'-0"
	8	14		10'-0"	
	10	14		11'-0"	
	12	14		11'-10"	
30-36	≤6	18	4'-4"	9'-0"	4'-0"
	8	18		10'-6"	
	10	18		11'-6"	
	12	18		12'-4"	
38-48	≤6	18	5'-4"	9'-6"	5'-0"
	8	18		11'-0"	
	10	18		12'-0"	
	12	18		12'-10"	
51-56	≤6	18	6'-4"	9'-10"	5'-0"
	8	18		11'-4"	
	10	18		12'-4"	
	12	18		13'-2"	

NOTES:

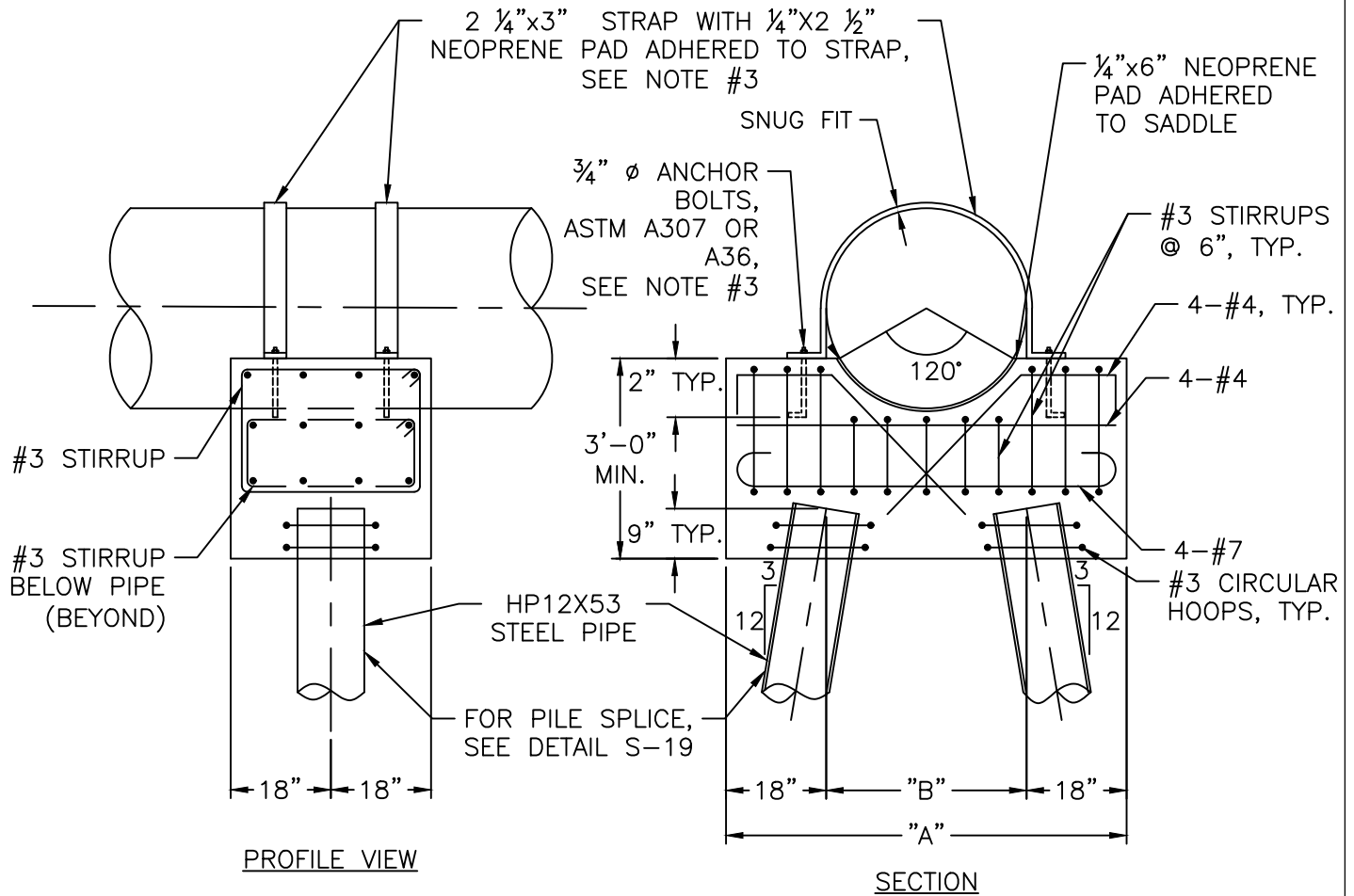
- SHALLOW FOUNDATION DESIGN SHOWN THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:
 - ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF
 - CONCRETE COMPRESSIVE STRENGTH = 4,000 PSI
 - GRADE 60 REINFORCING STEEL
 - MAX. STREAM VELOCITY = 10 FT/SEC
 - MAX. SUPPORT HEIGHT (H) = 12'-0"
 IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, THE FOUNDATION DESIGN SHALL BE REVIEWED BY THE ENGINEER.
- IF SUBGRADE AT LOCATION OF SUPPORTS IS DEEMED UNABLE TO WITHSTAND 2,000 PSF BEARING PRESSURE, A PILE SUPPORTED FOUNDATION SHALL BE UTILIZED AS PER DETAIL S-15.
- IF BEDROCK IS ENCOUNTERED WHICH WILL PREVENT 3- FEET MIN. COVER OVER FOOTING, DOWELS SHALL BE DRILLED INTO BEDROCK PRIOR TO PLACING FOUNDATION, SEE DETAIL S-17.
- TWELVE-INCH AND FOURTEEN-INCH THICK PIERS AND FOOTINGS SHALL BE REINFORCED WITH #5 BARS AT 12 INCHES O.C. IN EACH DIRECTION ON EACH FACE. EIGHTEEN-INCH WIDE PIERS AND FOOTINGS SHALL BE REINFORCED WITH #7 BARS AT 12 INCHES O.C. IN EACH DIRECTION ON EACH FACE.
- EIGHTEEN-INCH THICK PIERS SHALL REQUIRE TWO STRAPS OVER THE PIPE INSTEAD OF ONE (AS SHOWN).
- WHEN CONCRETE SUPPORTS ARE REQUIRED TO BE LOCATED WITHIN A STREAM AND ARE NOT COVERED WITH BLACKFILL, SEE DETAIL S-19 FOR MODIFICATIONS TO UPSTREAM FACE SUPPORT.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS DATE: 01/18/2025 NOT TO SCALE

AERIAL PIPE CROSSING
CONCRETE PIER DETAIL

S-14



WIDTH OF PILE CAP

CASING PIPE DIAMETER (IN.)	TOTAL WIDTH "A"	PILE SPACING "B"
≤ 36	6'-0"	3'-0"
38-42	6'-6"	3'-6"
45-51	7'-3"	4'-3"
54-60	8'-0"	5'-0"

NOTES:

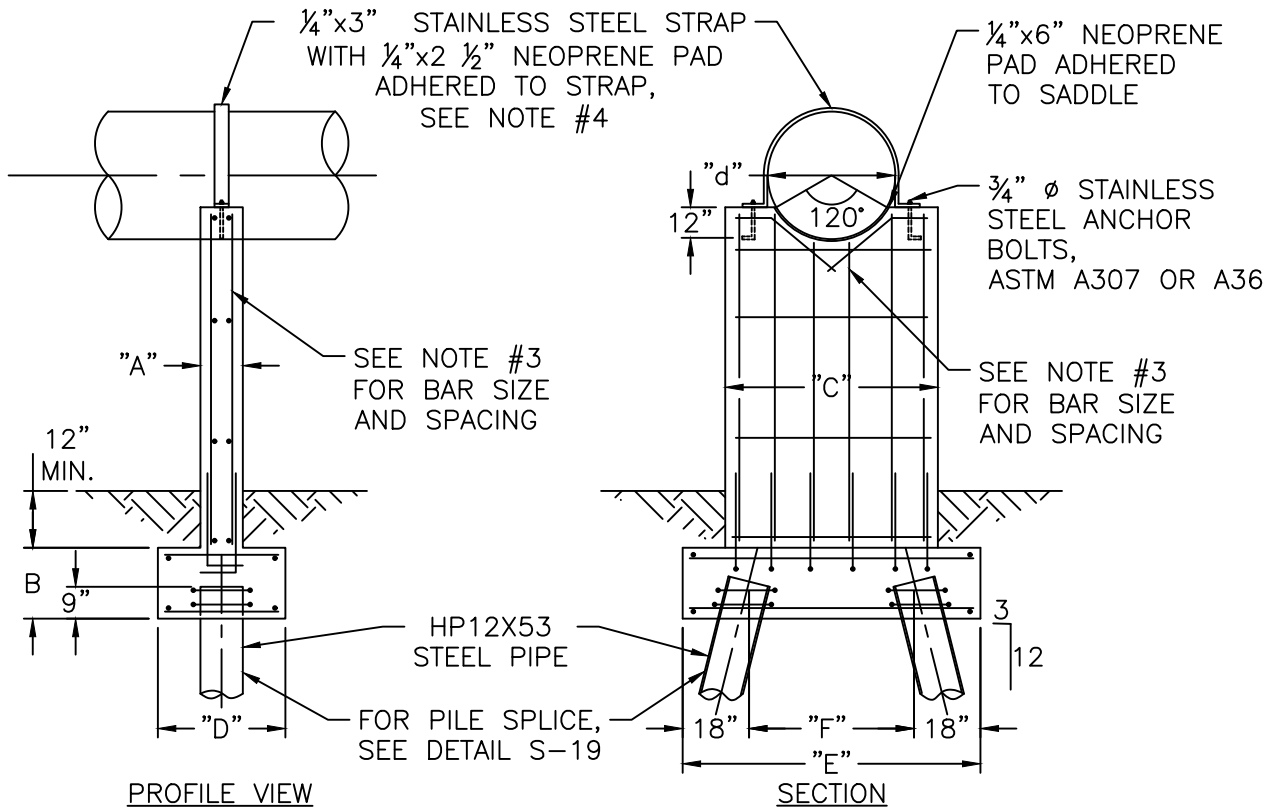
- PILE SUPPORTED FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED UPON THE FOLLOWING PARAMETERS:
 - MINIMUM CAPACITY OF HP12x53 PILE = 30 TONS
 - CONCRETE COMPRESSIVE STRENGTH = 4,000 PSI
 - GRADE 60 REINFORCING STEEL
 - MAXIMUM STREAM VELOCITY = 10 FT/SEC
 IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, FOUNDATION DESIGN SHALL BE REVIEWED BY THE PROJECT ENGINEER.
- LENGTH OF PILES SHALL BE AS REQUIRED TO DEVELOP 30 TON CAPACITY BY EITHER END BEARING, FRICTION, OR A COMBINATION OF END BEARING AND FRICTION. AS A MINIMUM, PILES SHALL BE DRIVEN AT LEAST 15 FEET INTO UNDISTURBED SOIL.
- ANCHOR BOLTS AND STRAPS SHALL BE STAINLESS STEEL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

AERIAL PIPE CROSSING
PIPE CAP DETAIL

S-15



CASING PIPE DIA. "d" (IN.)	PIER THICKNESS "A" (IN.)	FOOTING THICKNESS "B" (IN.)	PIER WIDTH "C"	FOOTING WIDTH "D"	FOOTING LENGTH "E"	PILE SPACING "F"
6-12	12	20	2'-4"	3'-0"	6'-0"	3'-0"
14-20	12	20	3'-0"	3'-0"	8'-0"	5'-0"
22-28	18	26	3'-8"	4'-0"	8'-9"	5'-9"
30-36	18	26	4'-4"	4'-0"	9'-0"	6'-0"
38-48	18	26	5'-4"	5'-0"	9'-6"	6'-6"
51-60	18	26	6'-4"	5'-0"	9'-10"	6'-10"

NOTES:

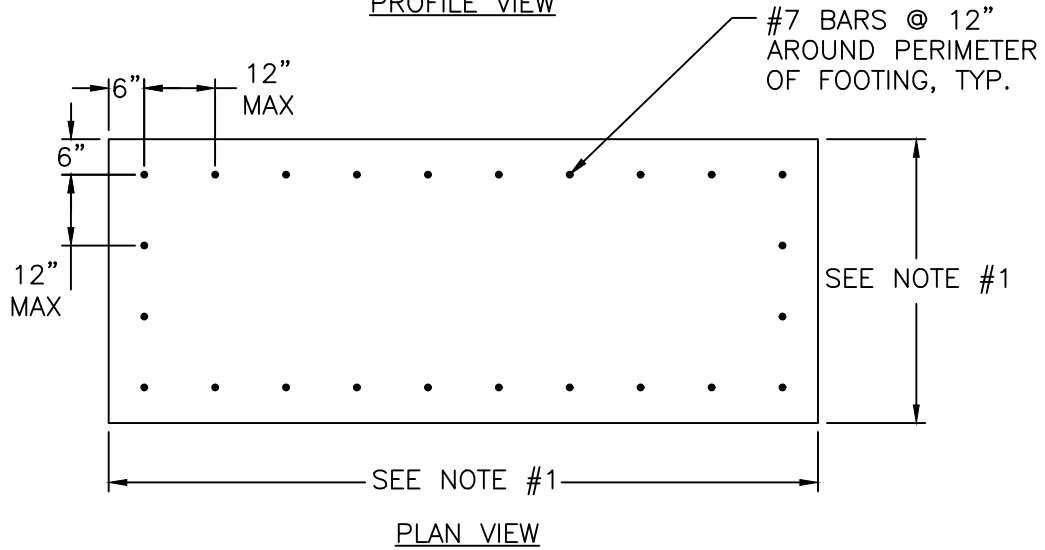
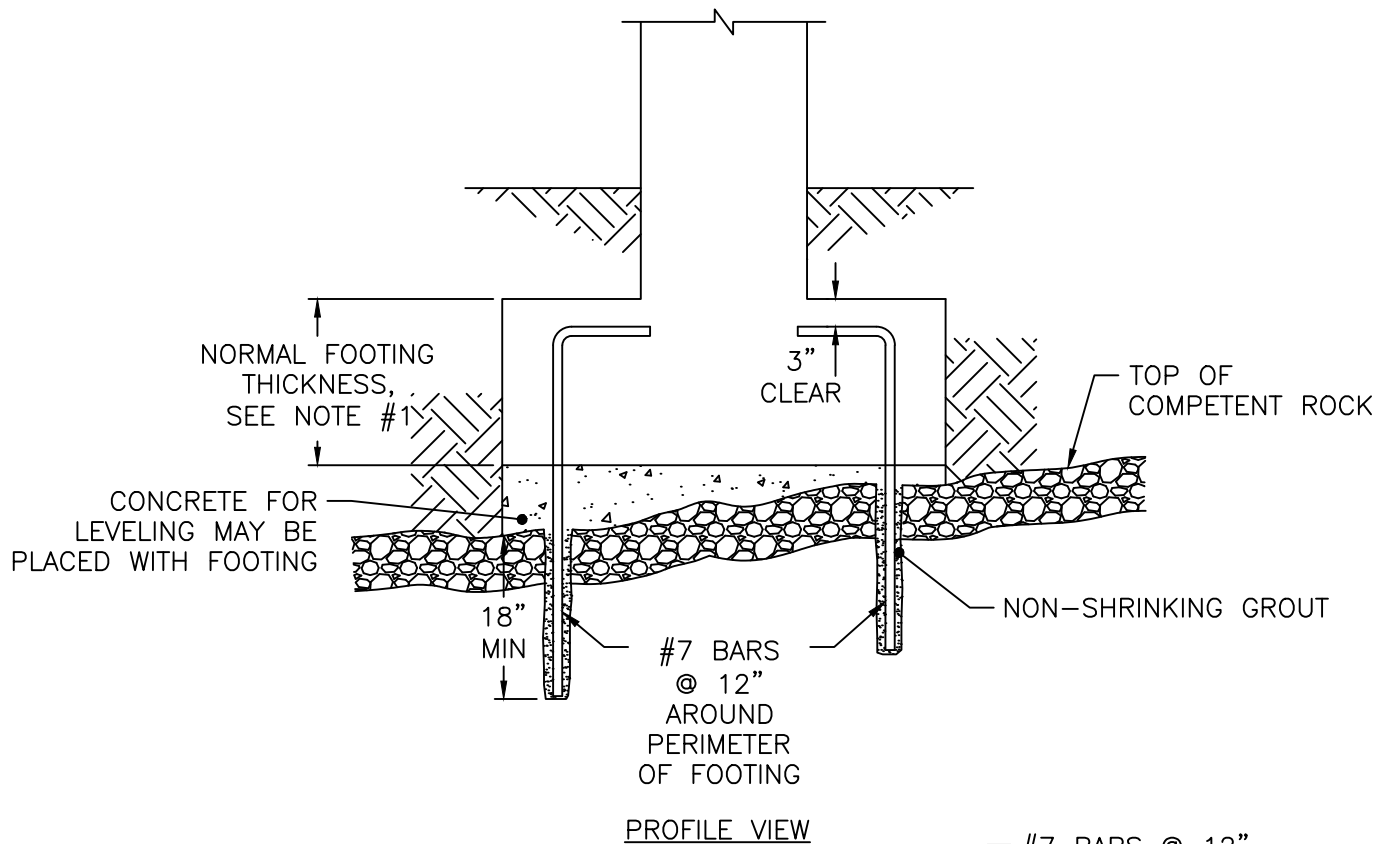
1. PILE SUPPORTED PIER FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:

- A. MINIMUM CAPACITY OF HP12x53 PILE = 30 TONS
- B. CONCRETE COMPRESSIVE STRENGTH = 4,000 PSI
- C. GRADE 60 REINFORCING STEEL
- D. MAXIMUM STREAM VELOCITY = 10 FT/SEC

IF FIELD CONDITIONS REQUIRE ANY DEVIATION FROM THESE PARAMETERS, THE FOUNDATION DESIGN SHALL BE REVIEWED BY THE ENGINEER.

- 2. LENGTH OF PILES SHALL BE AS REQUIRED TO DEVELOP 30 TON CAPACITY BY EITHER END BEARING, FRICTION OR A COMBINATION OF END BEARING AND FRICTION. AS A MINIMUM, PILES SHALL BE DRIVEN AT LEAST 15 FEET INTO UNDISTURBED SOIL.
- 3. TWELVE-INCH AND FOURTEEN-INCH WIDE PIERS SHALL BE REINFORCED WITH #5 BARS AT 12 INCHES O.C. IN EACH DIRECTION ON EACH FACE. EIGHTEEN-INCH WIDE PIERS SHALL BE REINFORCED WITH #7 BARS AT 12 INCHES O.C. IN EACH DIRECTION ON EACH FACE. FOOTINGS SHALL BE REINFORCED TYPICALLY TO PIERS.
- 4. EIGHTEEN-INCH WIDE PIERS SHALL REQUIRE TWO STRAPS OVER THE PIPE INSTEAD OF ONE (AS SHOWN).
- 5. WHEN CONCRETE SUPPORTS ARE REQUIRED TO BE LOCATED WITHIN A STREAM AND ARE NOT COVERED WITH BACKFILL, SEE DETAIL S-19 FOR MODIFICATIONS TO UPSTREAM FACE OF SUPPORT.

CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
	AERIAL PIPE CROSSING PILE SUPPORTED PIER DETAIL	
S-16		

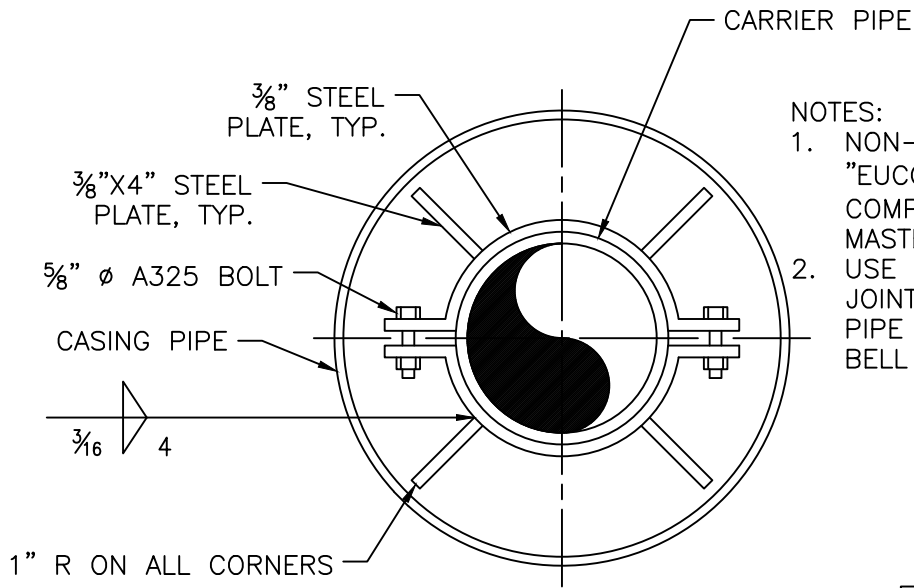
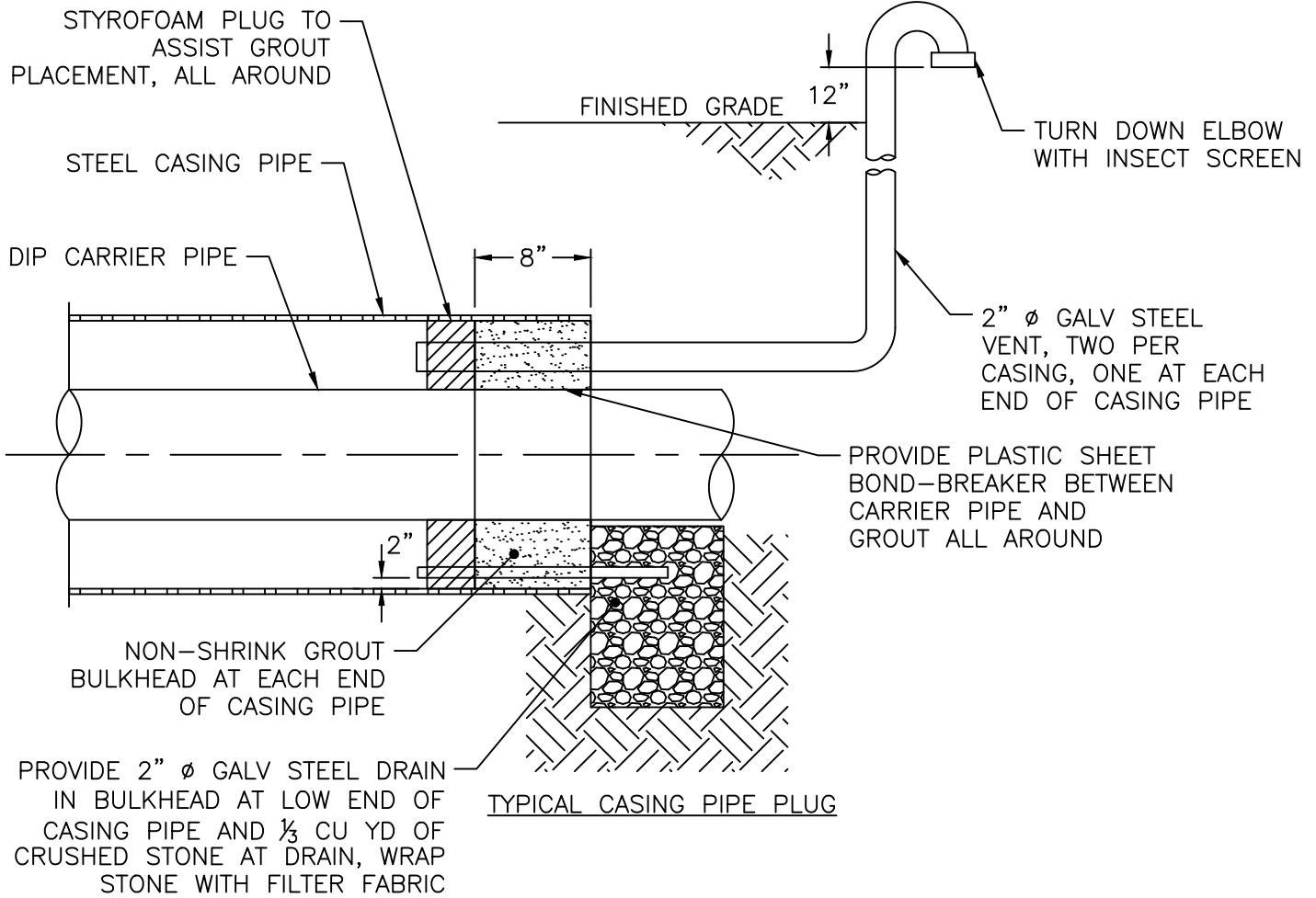


NOTES:

1. GEOMETRY OF FOOTING SHALL MATCH GEOMETRY OF CONCRETE PIERS WITH HEIGHT OF 6 FEET OR LESS AS PER DETAIL S-14.
2. NON-SHRINK GROUT SHALL BE "EUCO-N-S" BY THE EUCLID CHEMICAL COMPANY; "MASTERFLOW 713" BY MASTER BULDERS, OR EQUAL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	AERIAL PIPE CROSSING CONCRETE PIER ON BEDROCK	
S-17		



NOTES:

1. NON-SHRINK GROUT SHALL BE "EUCCO-N-S" BY THE EUCLID CHEMICAL COMPANY; "MASTERFLOW 713" BY MASTER BUILDERS, OR EQUAL.
2. USE A MINIMUM OF 2 SPIDERS PER JOINT PLACED ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT.

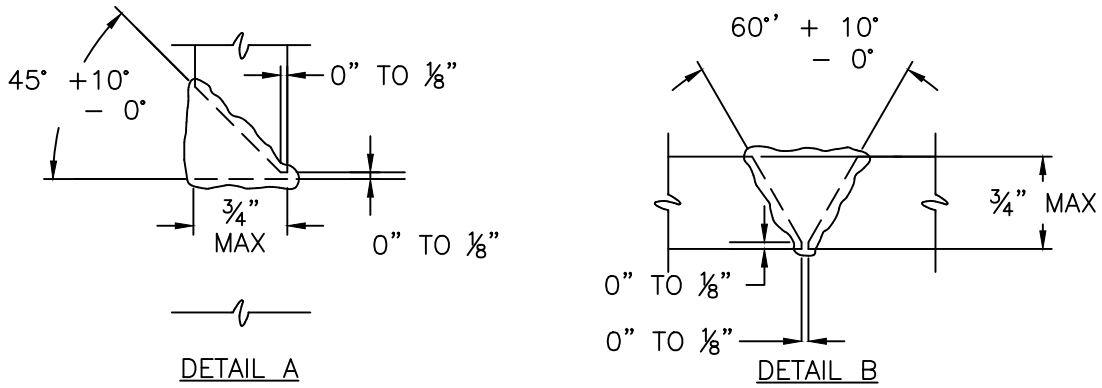
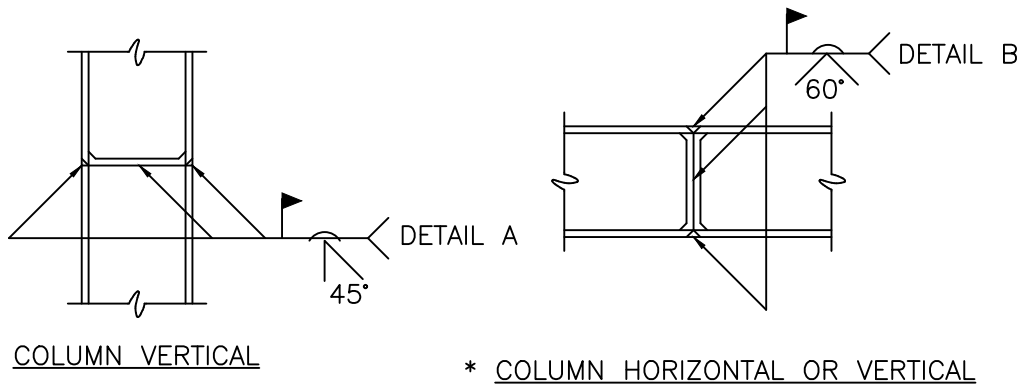
PIPE ALIGNMENT GUIDE

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

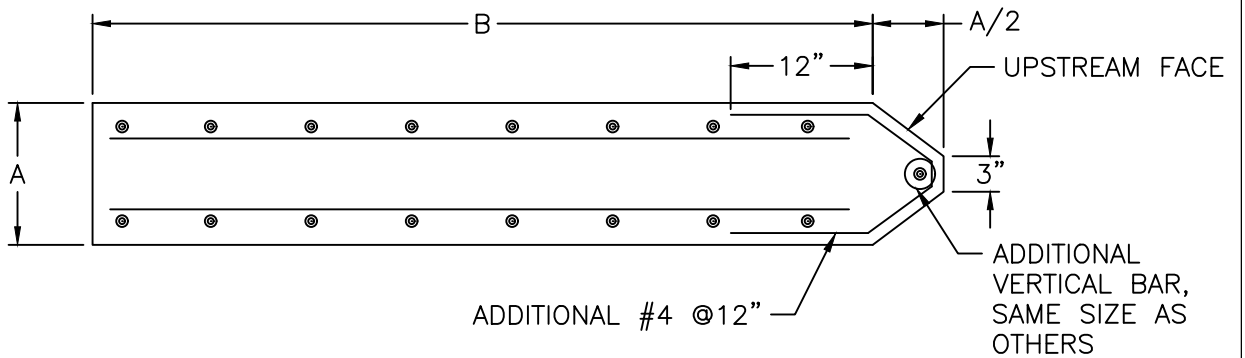
AERIAL PIPE CROSSING
CASING PIPE DETAILS

S-18



* POSITION OF COLUMN DURING WELDING

STEEL PILE SPLICE



PLAN - CONCRETE SUPPORT NOSING
(WHEN EXPOSED TO STREAM FLOW)

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

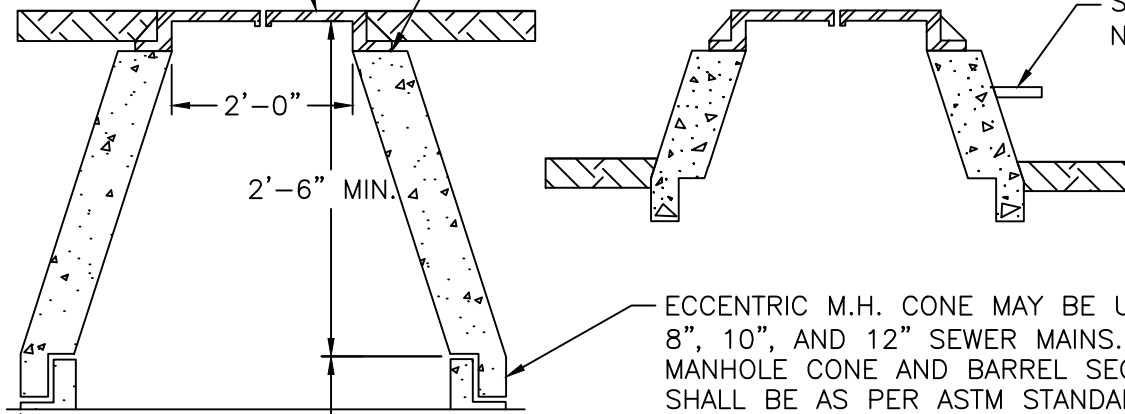
AERIAL PIPE
CROSSING CONCRETE
SUPPORT DETAILS

S-19

SEE DETAIL S-25 FOR
MANHOLE FRAME AND COVER

NEW MANHOLES USE A BUTYL
SEALANT BETWEEN FRAME AND
MANHOLE TOP SECTION WHEN
SECURING FRAME TO MANHOLE TO
PROVIDE A WATER TIGHT SEAL

STEP, SEE
NOTE #3



ECCENTRIC M.H. CONE MAY BE USED ON
8", 10", AND 12" SEWER MAINS.
MANHOLE CONE AND BARREL SECTIONS
SHALL BE AS PER ASTM STANDARDS

"O" RING SEAL
OR RAM-NECK
RUBBER BOOT

NOTES:

1. LATERAL INVERT SHALL NOT BE LOWER THAN MAIN SPRING LINE.
2. MANHOLE SHALL BE 3' ABOVE 100 YEAR FLOOD PLAIN OR SEALED AND VENTED TO 3' ABOVE 100 YEAR FLOOD PLAIN.
3. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE, OUTSIDE STEPS MUST BE PROVIDED. SEE DETAIL S-28 FOR STEP.
4. IN NON TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1' ABOVE FINISHED GROUND SURFACE.

SHELF
SLOPE 60°

4'-6' DIA.
AS REQUIRED

VARIABLE

4"

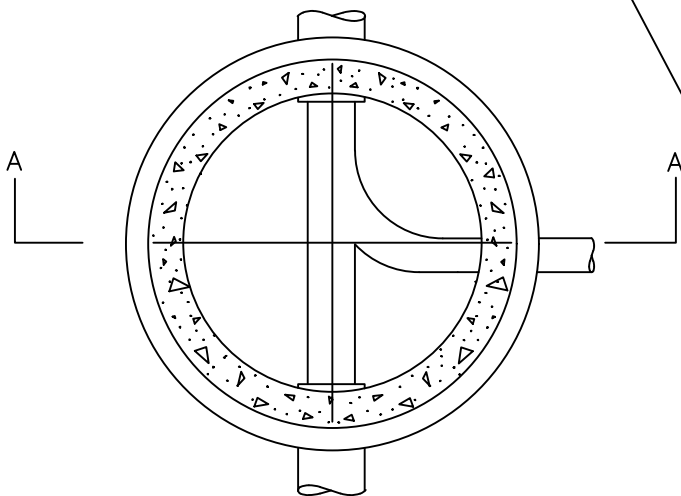
6"

9"

SECTION A-A

SEE SEWER
DESIGN SECTION

MIN. 9" COMPACTED #67 STONE BASE TO
BE INSTALLED UNDER NEW MANHOLE.

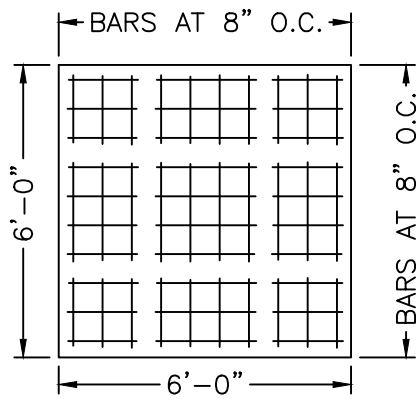


CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

STANDARD PRECAST
SANITARY SEWER
MANHOLE

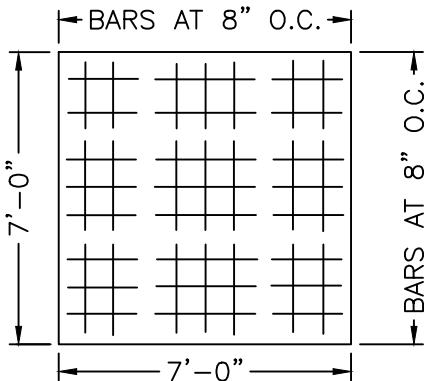
S-20



REINFORCED CONC. FOOTING
FOR 4' PRECAST MANHOLE

BILL OF MATERIAL FOR 4' MANHOLE BASE

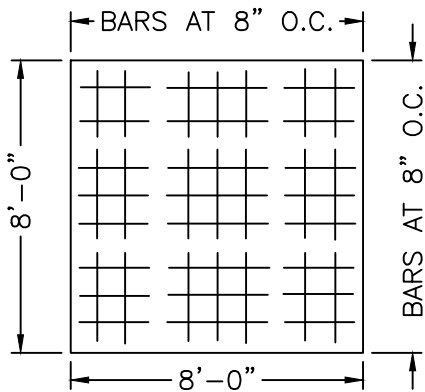
BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	5'-6"	18	103
CL. "A" CONCRETE TOTAL CU. YDS.			1.0



REINFORCED CONC. FOOTING
FOR 5' PRECAST MANHOLE

BILL OF MATERIAL FOR 5' MANHOLE BASE

BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	6'-6"	20	136
CL. "A" CONCRETE TOTAL CU. YDS.			1.4



REINFORCED CONC. FOOTING
FOR 6' PRECAST MANHOLE

BILL OF MATERIAL FOR 6' MANHOLE BASE

BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	7'-6"	24	165
CL. "A" CONCRETE TOTAL CU. YDS.			1.8

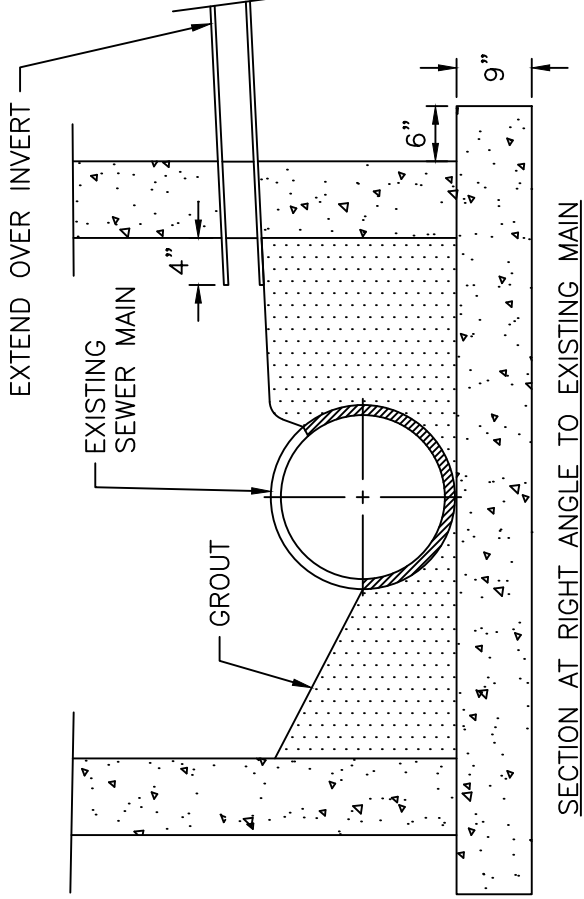
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

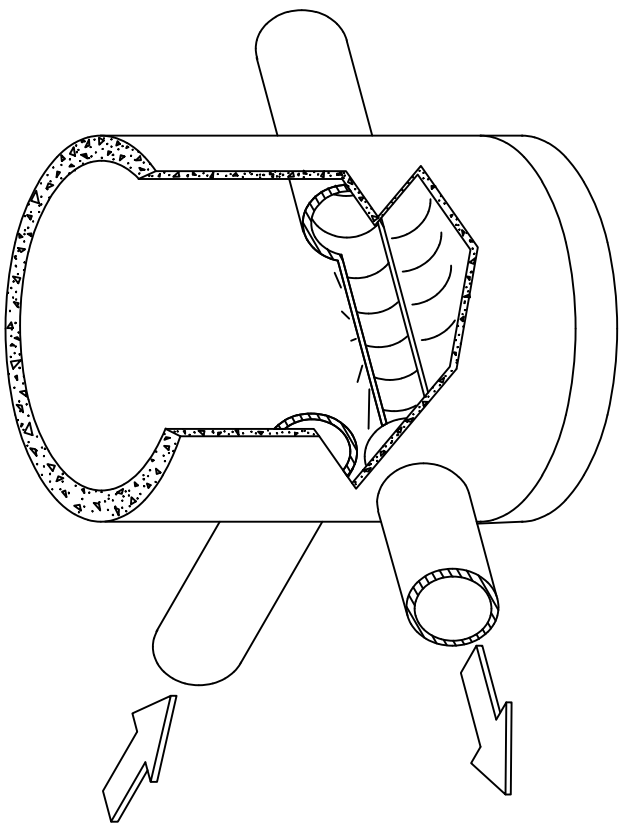
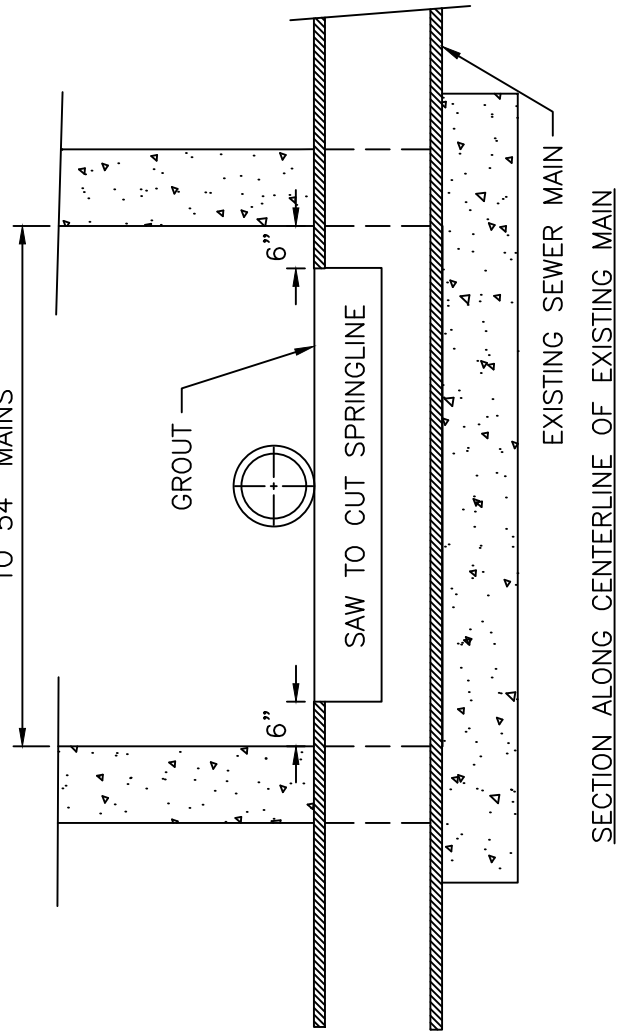
EXTENDED BASE OR
CAST-IN-PLACE REINFORCED
CONCRETE BASE

S-21

* ALL BASES ARE MINIMUM 9" THICK

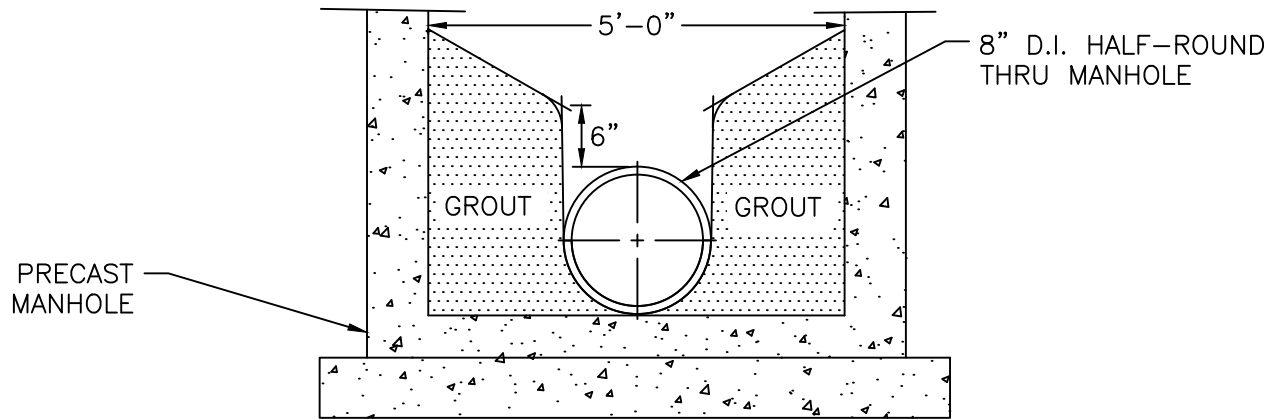


4'-0" FOR 8" TO 12"
 MAINS 5'-0" FOR 15" TO
 30" MAINS 6'-0" FOR 36"
 TO 54" MAINS

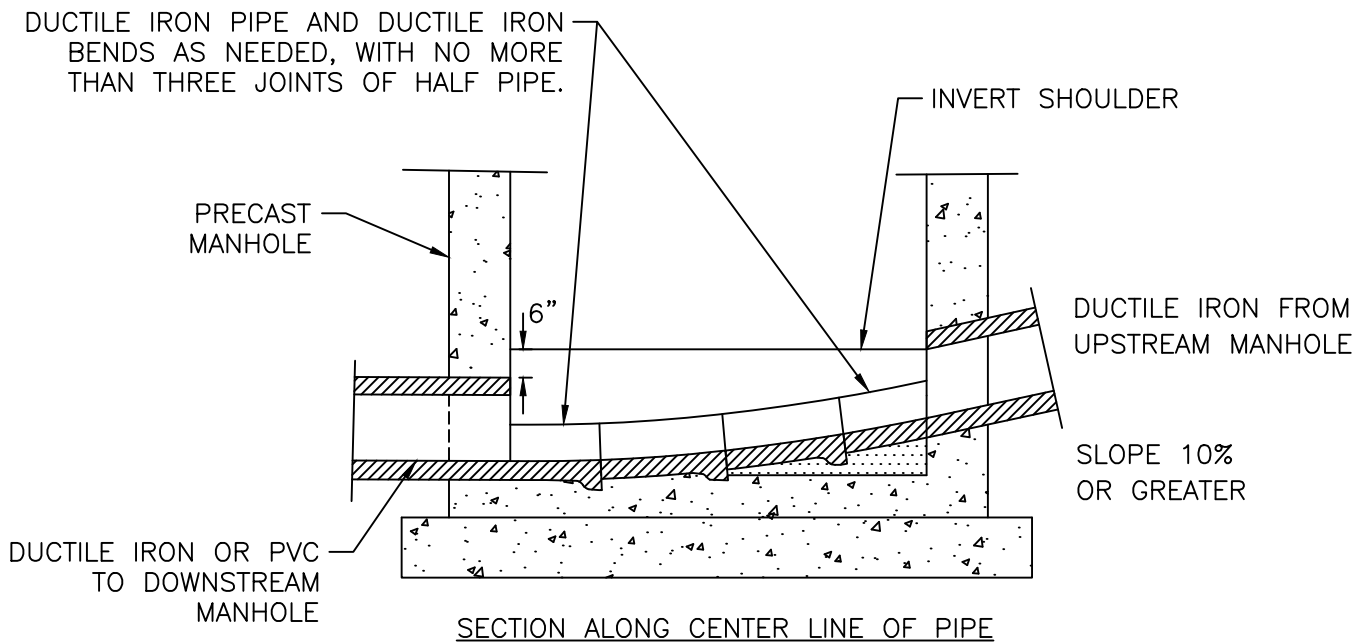


- NOTES:
1. FLOW SHALL BE MAINTAINED DURING CONSTRUCTION.
 2. THIS DETAIL TO BE USED WHEN A 6" OR LARGER LATERAL NECESSITATES CONSTRUCTION OF A NEW MANHOLE.
 3. SEE DETAIL S-20 FOR PRECAST MANHOLES.
 4. THE CONTRACTOR SHALL PROVIDE A MINIMUM 9" COMPACTED #67 STONE BASE.
 5. FOR USE ON DIP, CONCRETE, AND PVC ONLY.
 6. (NOT ALLOWED ON VCP) SEE DETAIL S-21 FOR REINFORCING OF POURED IN-PLACE BASE.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	STANDARD MANHOLE INSTALLATION OVER EXISTING SEWER MAIN	
S-22		



SECTION AT RIGHT ANGLE TO CENTER LINE OF PIPE



SECTION ALONG CENTER LINE OF PIPE

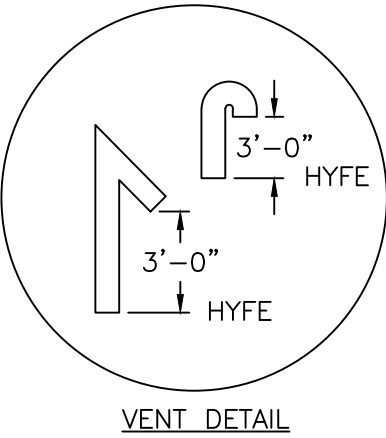
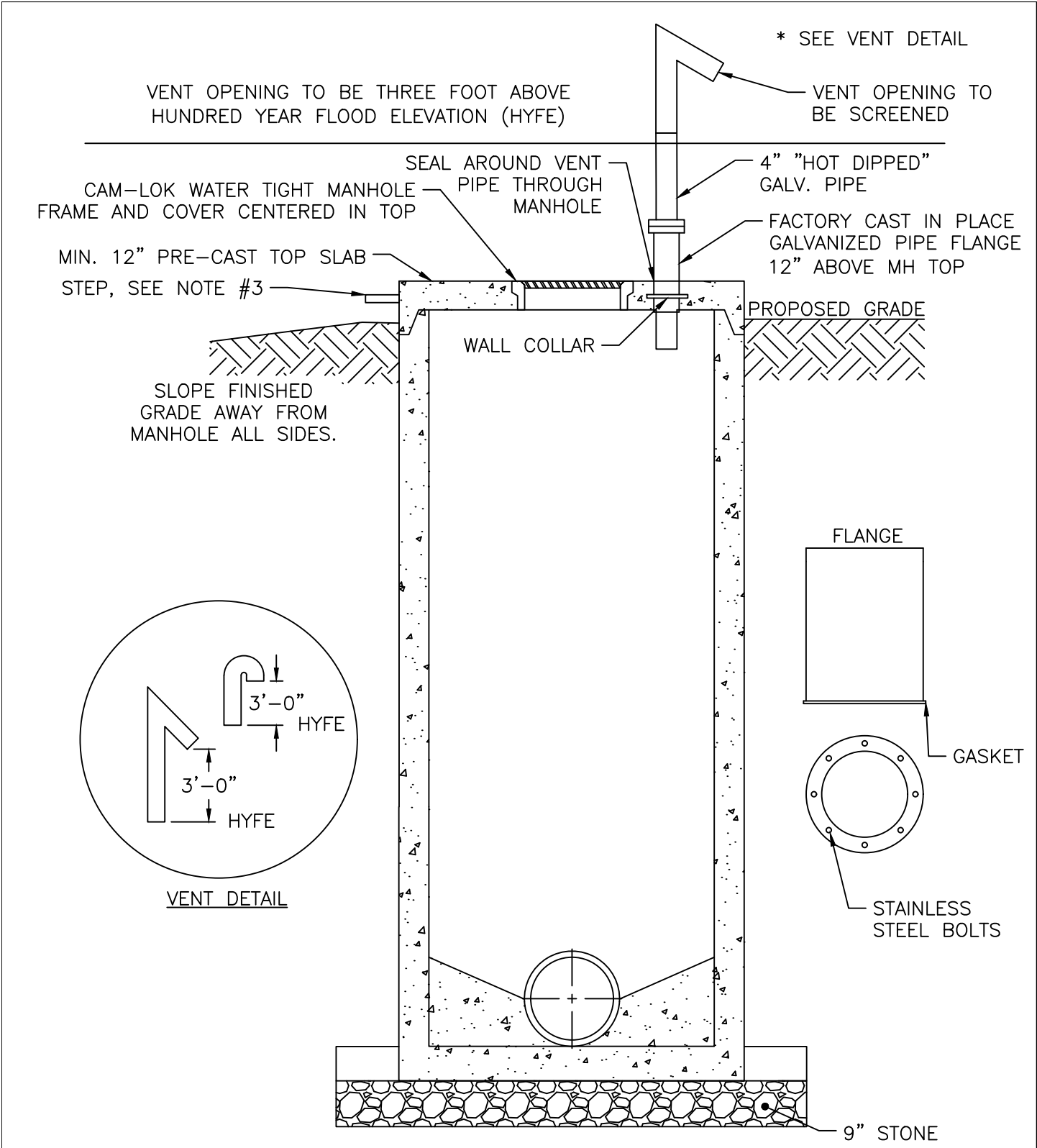
NOTE:
 NO HORIZONTAL ALIGNMENT CHANGE
 CAN BE MADE WITHIN THIS MANHOLE
 TYPE. USE ON GRADES 10% OR GREATER.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

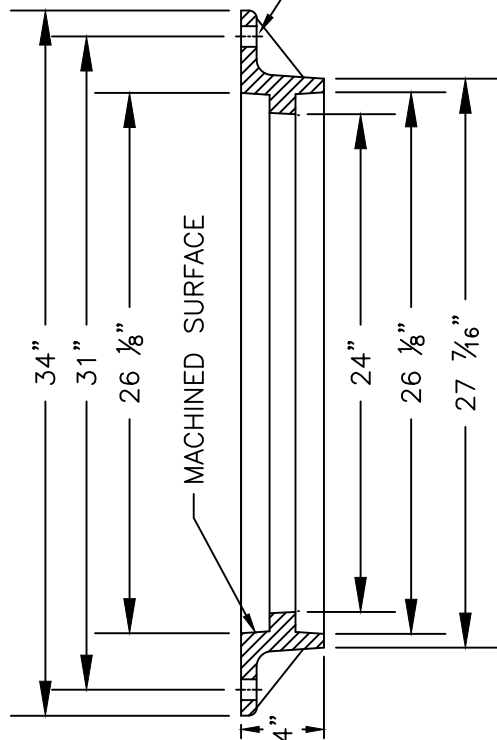
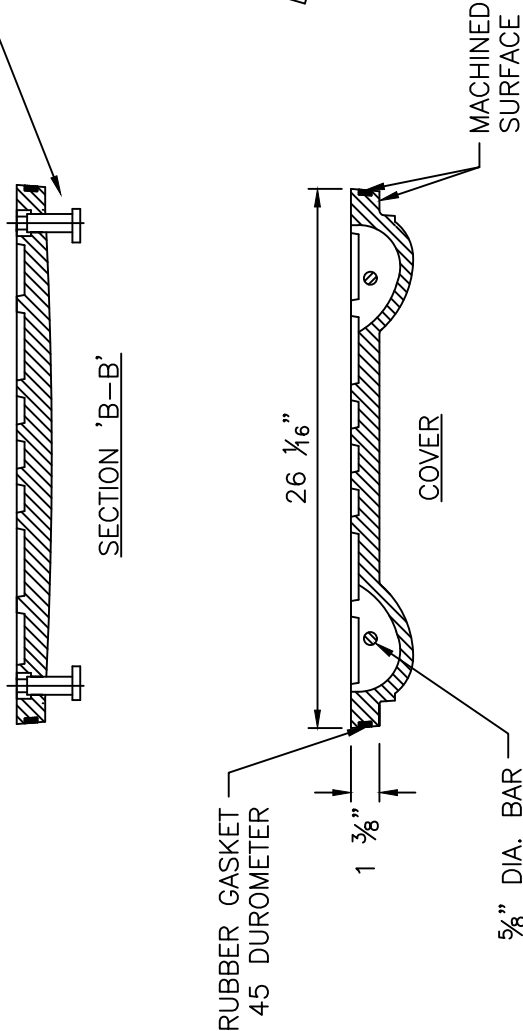
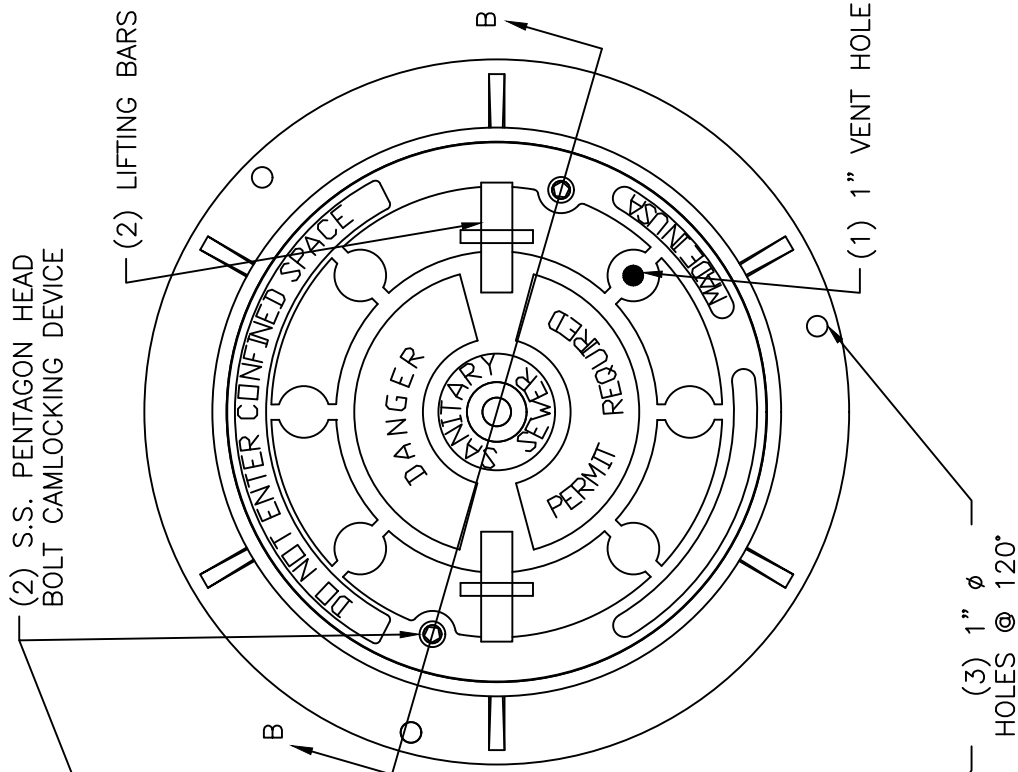
STANDARD HIGH VELOCITY
 MANHOLE INVERT

S-23



- NOTES:
1. VENT MUST BE FACTORY WELDED, FABRICATED, AND "HOT DIPPED" GALVANIZED.
 2. HYFE- HUNDRED YEAR FLOOD ELEVATION.
 3. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE, OUTSIDE STEPS MUST BE PROVIDED. SEE DETAIL S-28 FOR STEP.

CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
	STANDARD SEAL TIGHT MANHOLE WITH VENTED STACK	
S-24		



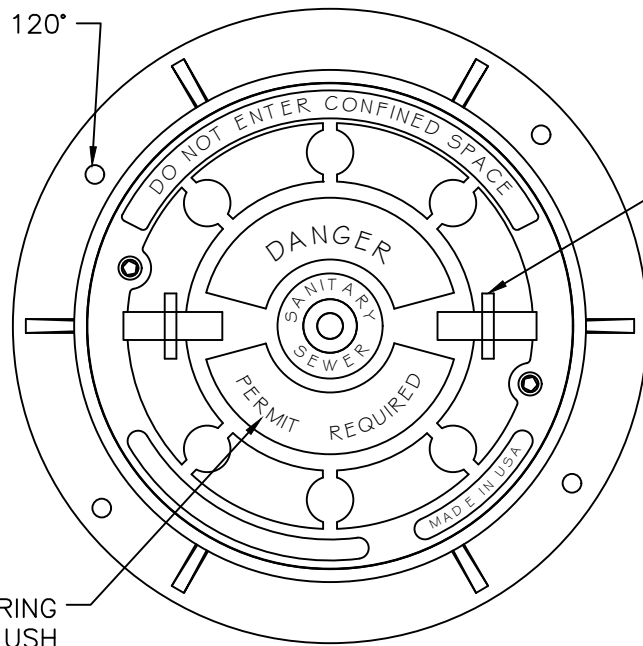
NOTE: COVER REQUIRED WHEN WATER TIGHT MANHOLE SPECIFIED.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
FLAT MANHOLE COVER		
S-25A		

(4) 1" ϕ HOLES @ 120°

MINIMUM AVG. WEIGHT:

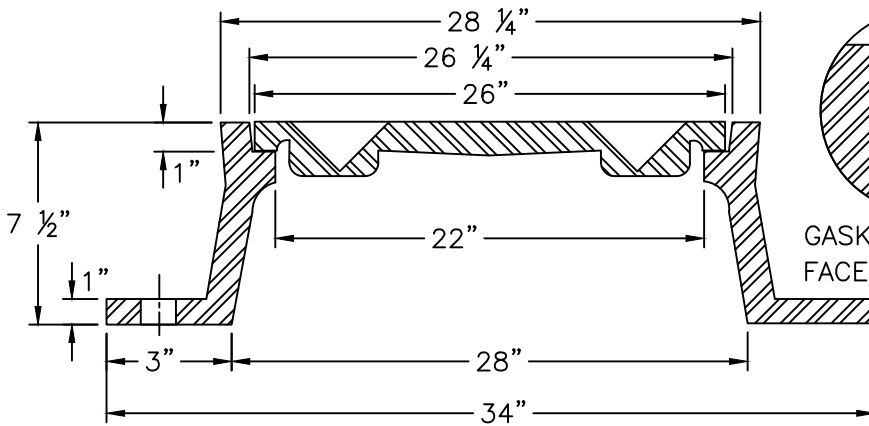
- FRAME 182 LBS
- COVER 160 LBS
- TOTAL 342 LBS



(2) LIFTING BARS

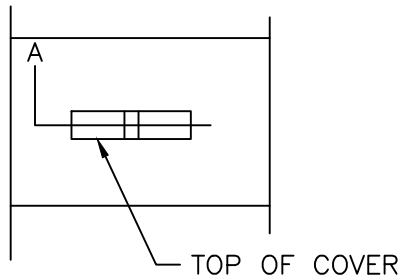
1" LETTERING RECESSED FLUSH

PLAN

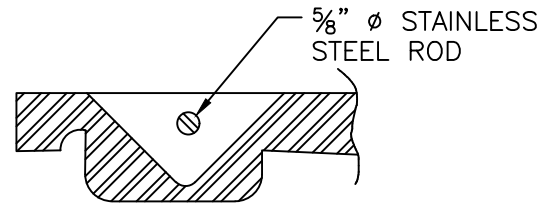


GASKET IN VERTICAL FACE OF COVER

FRAME MUST BE ANCHORED IN ACCORDANCE WITH DETAIL S-25



TOP OF COVER



SECTION A

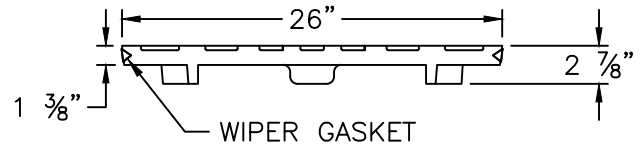
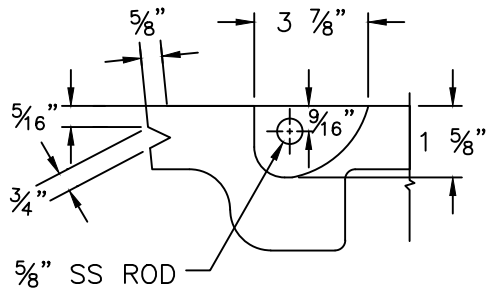
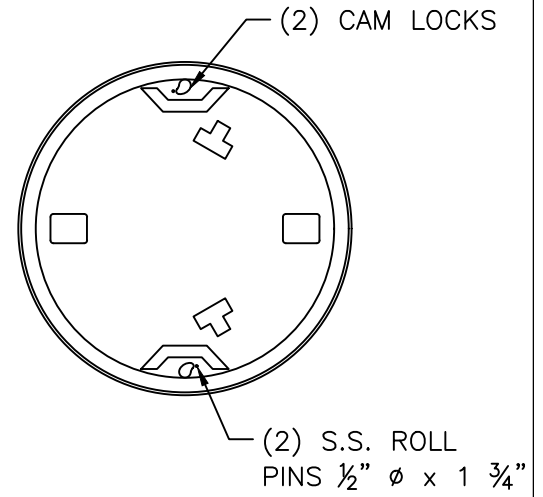
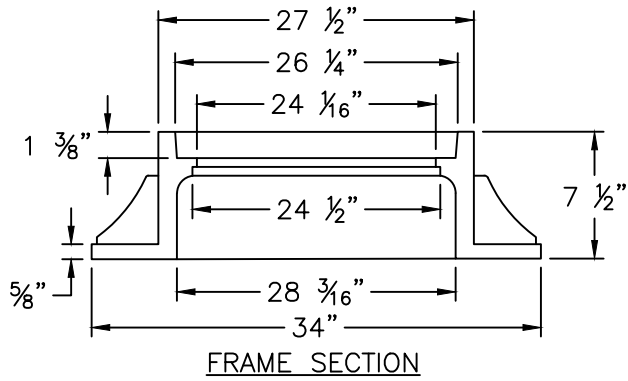
TYPICAL LIFTING DEVICE

**CITY OF RALEIGH
STANDARD DETAIL**

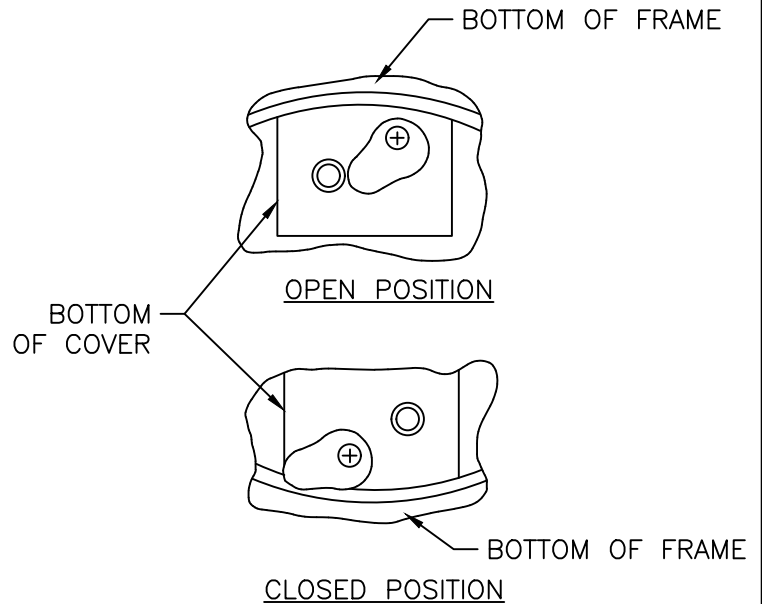
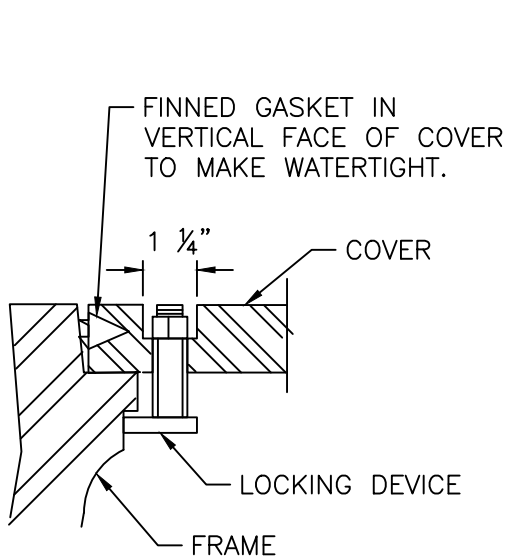
REVISIONS DATE: 05/24/2024 NOT TO SCALE

MANHOLE FRAME AND
WATERTIGHT COVER

S-26



TYPICAL CAM LOCK MANHOLE



TYPICAL LOCKING DEVICE

NOTE:

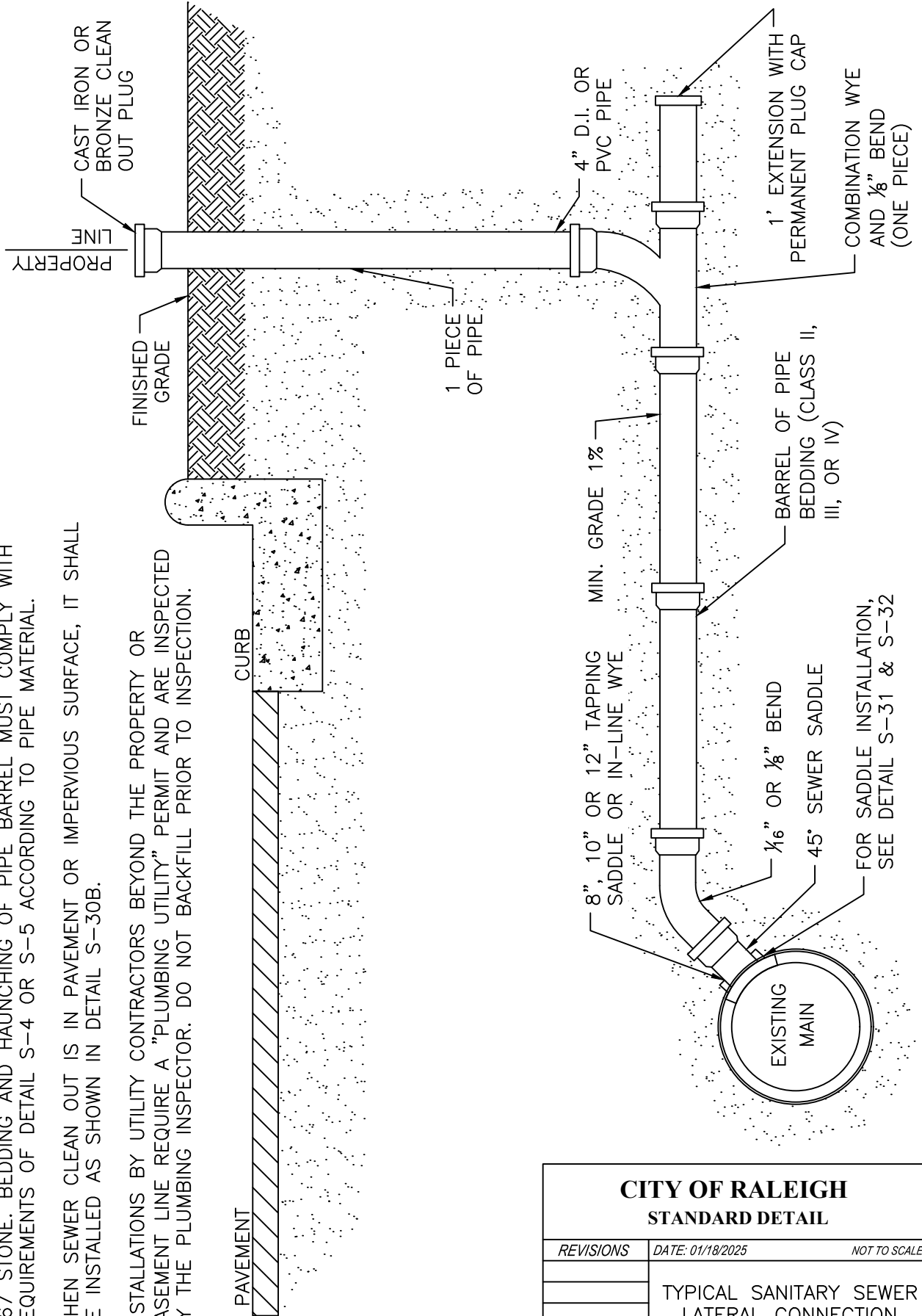
1. WHEN WATERTIGHT NOT SPECIFIED, TOP SHALL HAVE ONE 1" VENT HOLE.
2. STANDARD: PENTAGON HEAD S.S. OPTIONAL: S.S. HEX HEAD BOLT.
3. RING MUST BE ANCHORED IN ACCORDANCE WITH DETAIL S-25.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	WATERTIGHT MANHOLE FRAME WITH CAM LOCK COVER	
	S-27	

NOTES:

1. THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6" LIFTS WITH MECHANICAL TAMP. ALL TAPS WILL BE MADE USING MECHANICAL TAPPING MACHINE. FOR PVC INSTALLATIONS, SADDLE AND BEND MUST BE BEDDED IN #67 STONE. BEDDING AND HAUNCHING OF PIPE BARREL MUST COMPLY WITH REQUIREMENTS OF DETAIL S-4 OR S-5 ACCORDING TO PIPE MATERIAL.
2. WHEN SEWER CLEAN OUT IS IN PAVEMENT OR IMPERVIOUS SURFACE, IT SHALL BE INSTALLED AS SHOWN IN DETAIL S-30B.
3. INSTALLATIONS BY UTILITY CONTRACTORS BEYOND THE PROPERTY OR EASEMENT LINE REQUIRE A "PLUMBING UTILITY" PERMIT AND ARE INSPECTED BY THE PLUMBING INSPECTOR. DO NOT BACKFILL PRIOR TO INSPECTION.

* SERVICE LATERAL MATERIAL AS REQUIRED

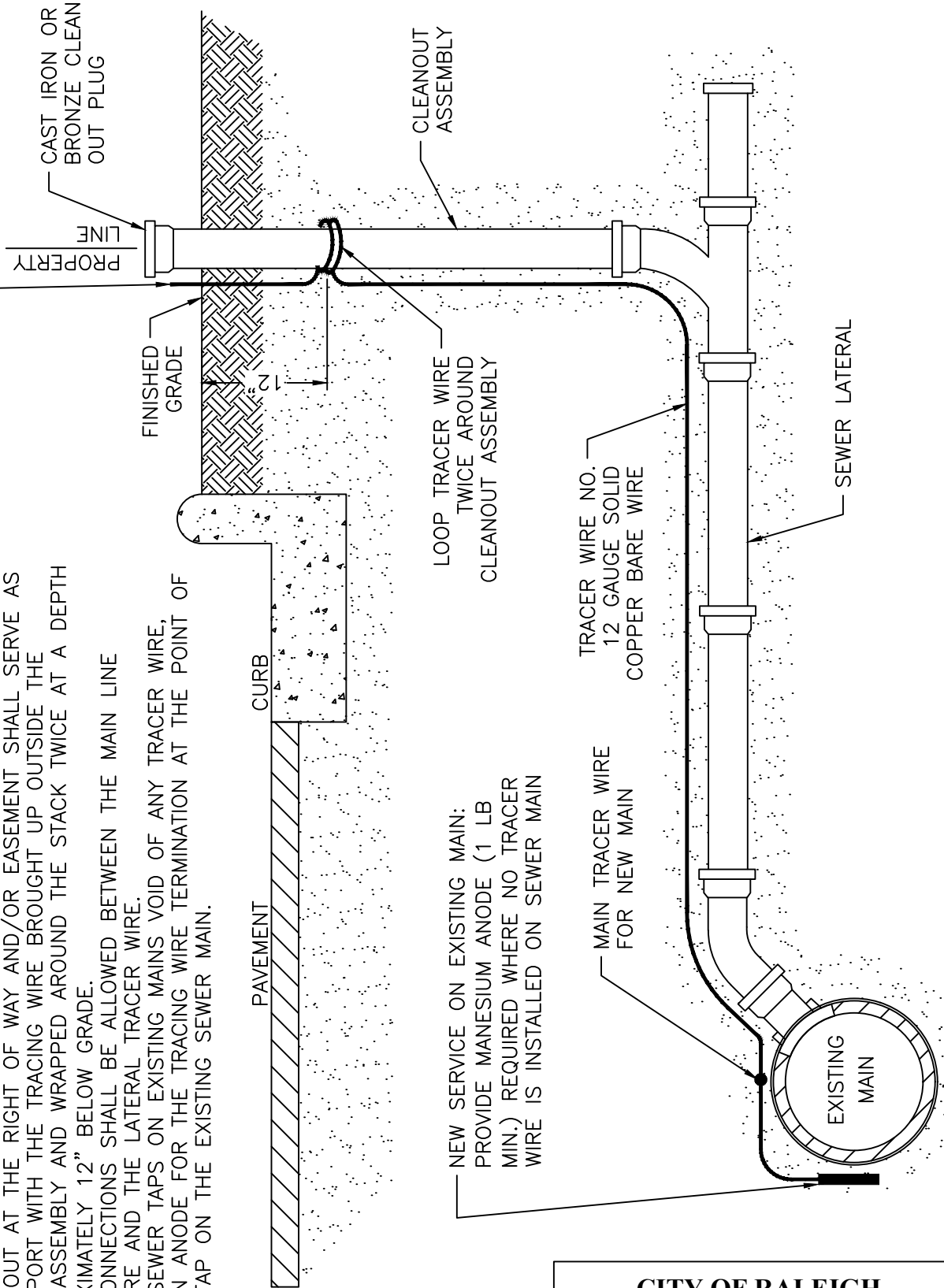


CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	TYPICAL SANITARY SEWER LATERAL CONNECTION	
S-30		

NOTES:

1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. WHERE JOINTS ARE NECESSITATED IN THE WIRE, THE JOINTS SHALL BE SECURELY BONDED TOGETHER WITH AN APPROVED INDUSTRIAL CRIMP CONNECTOR TO PROVIDE ELECTRICAL CONTINUITY. CRIMPS SHALL BE SIMILAR METAL.
2. THE CLEANOUT AT THE RIGHT OF WAY AND/OR EASEMENT SHALL SERVE AS THE TEST PORT WITH THE TRACING WIRE BROUGHT UP OUTSIDE THE CLEANOUT ASSEMBLY AND WRAPPED AROUND THE STACK TWICE AT A DEPTH OF APPROXIMATELY 12" BELOW GRADE.
3. SPliced CONNECTIONS SHALL BE ALLOWED BETWEEN THE MAIN LINE TRACER WIRE AND THE LATERAL TRACER WIRE.
4. FOR NEW SEWER TAPS ON EXISTING MAINS VOID OF ANY TRACER WIRE, PROVIDE AN ANODE FOR THE TRACING WIRE TERMINATION AT THE POINT OF THE NEW TAP ON THE EXISTING SEWER MAIN.

EXTEND TRACER WIRE TO JUST BELOW CLEAN OUT PLUG

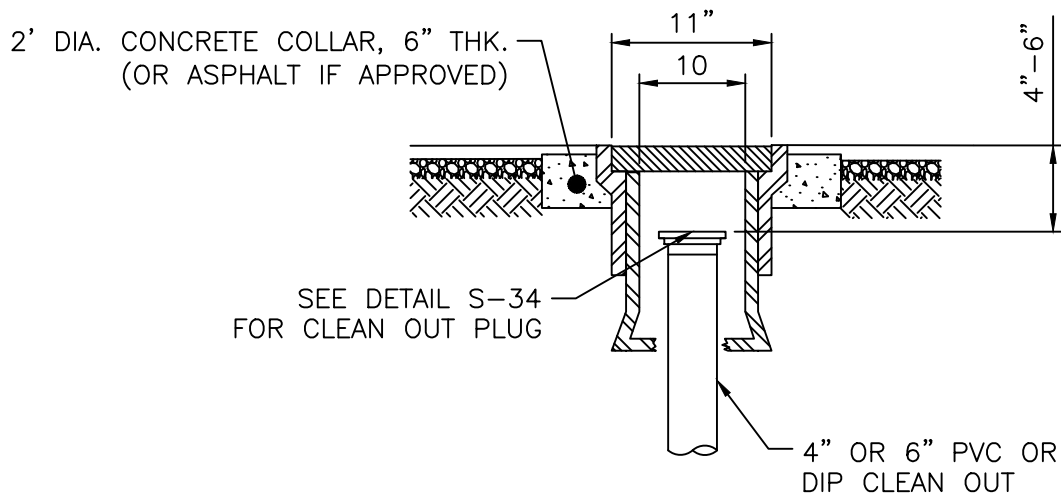
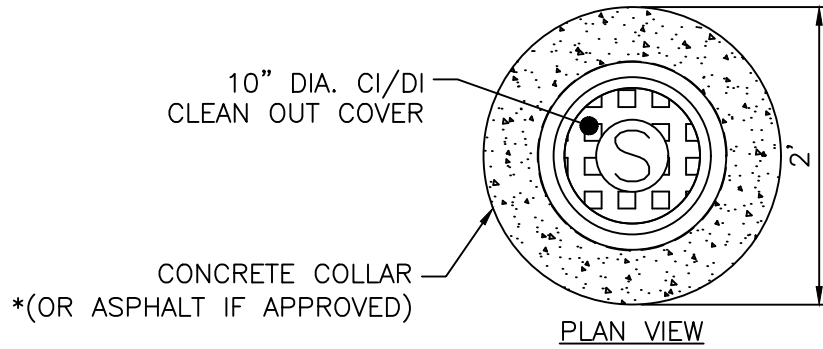


**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS DATE: 01/18/2025 NOT TO SCALE

TYPICAL SANITARY SEWER
LATERAL TRACER WIRE

S-30A



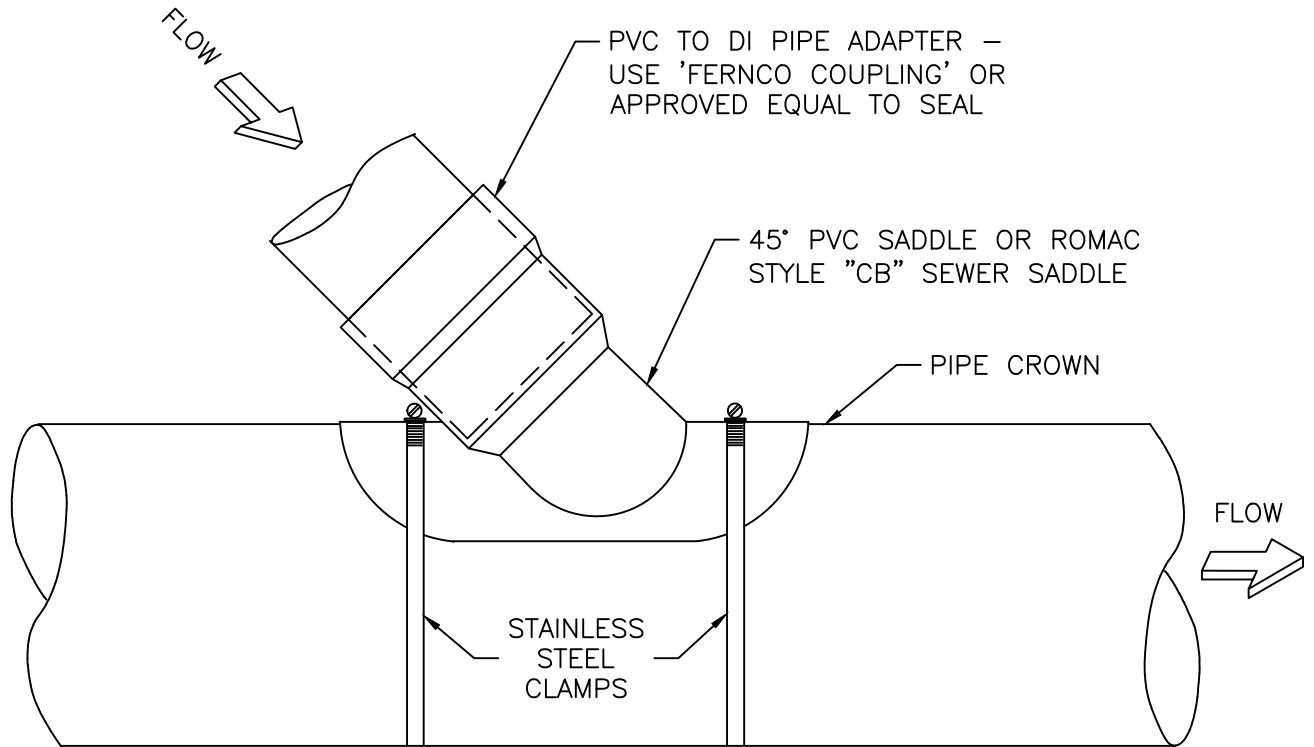
SECTION VIEW

**CITY OF RALEIGH
STANDARD DETAIL**

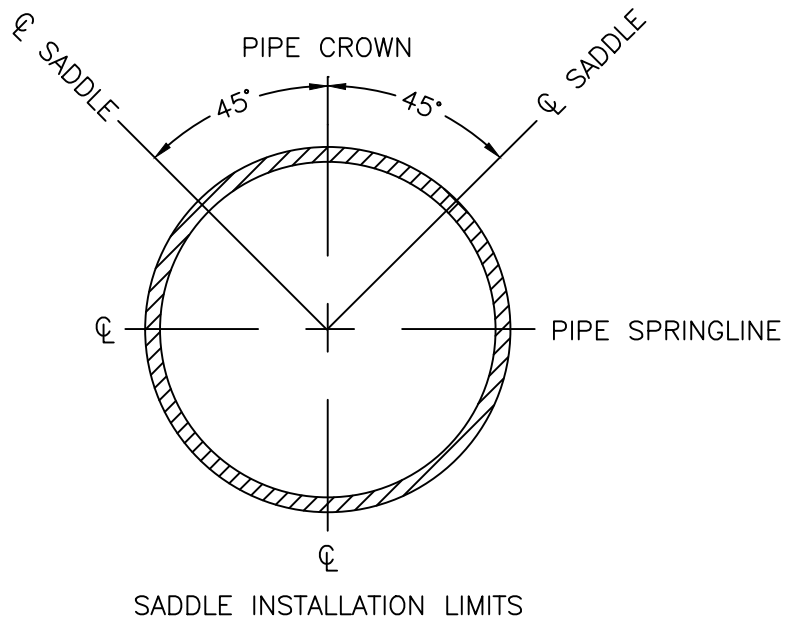
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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	TRAFFIC RATED CLEAN OUT STRUCTURE
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S-30B



BACKFILL UNDER PVC SADDLE, ADAPTOR, AND CAST IRON
BEND WITH #67 STONE AS SHOWN ON DETAIL S-4.

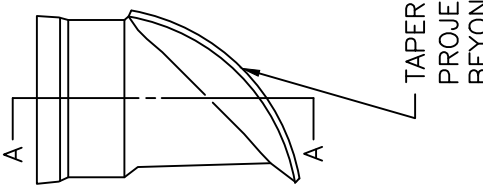
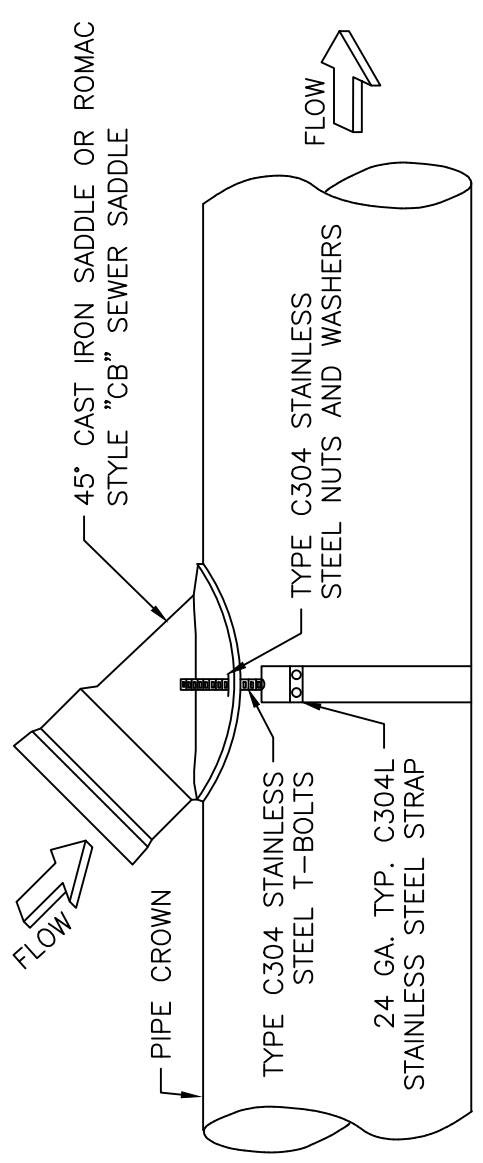
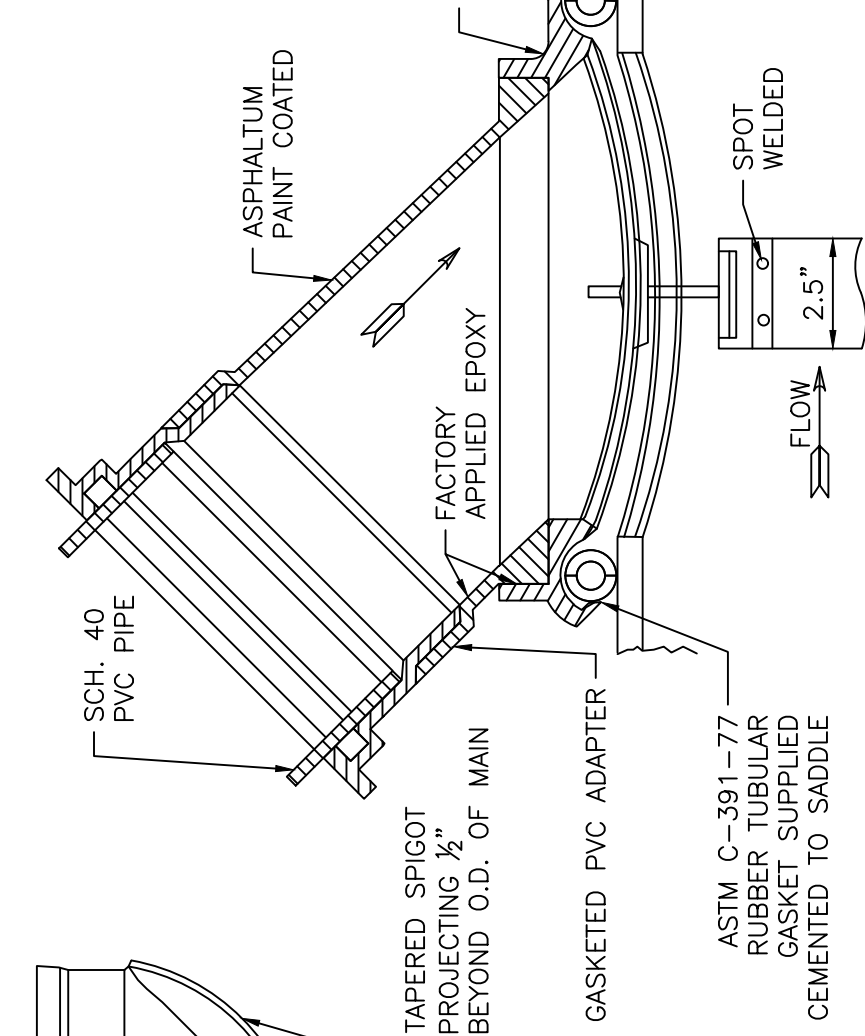
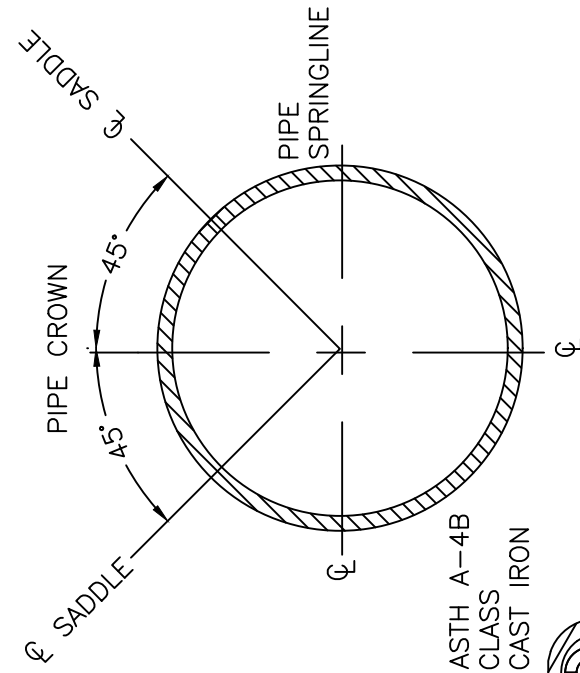


CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

LATERAL SADDLE
INSTALLATION DETAIL
FOR PVC PIPE

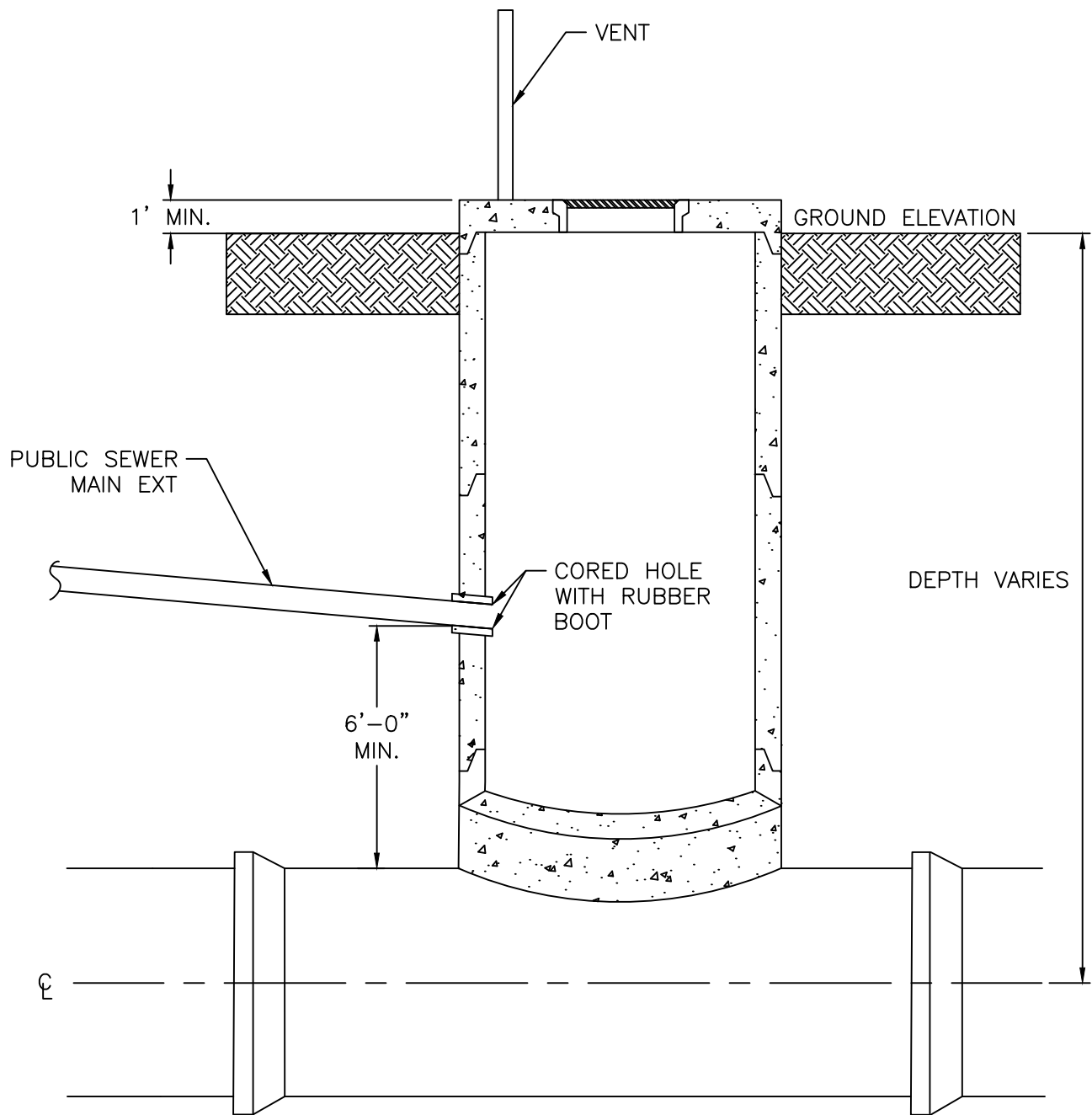
S-31



NOTE:
SADDLE TO BE GENECO
E40 OR EQUAL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	LATERAL SADDLE INSTALLATION FOR VCP AND DUCTILE IRON PIPE	
	S-32	



NOTES:

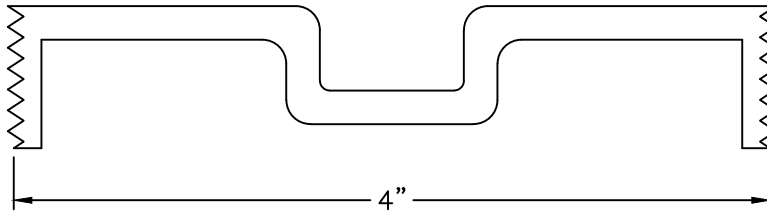
1. HOLE SHALL BE CORED IN RISER SECTION FOR PUBLIC SERVICE MAIN EXTENSION.
2. RUBBER BOOT SHALL BE UTILIZED ON ALL CORES.
3. CORES SHALL BE IN CENTER OF RISER SECTION.
4. CONNECTION TO TEE MANHOLE MUST BE MADE BY CONTRACTOR APPROVED BY CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.

CITY OF RALEIGH
STANDARD DETAIL

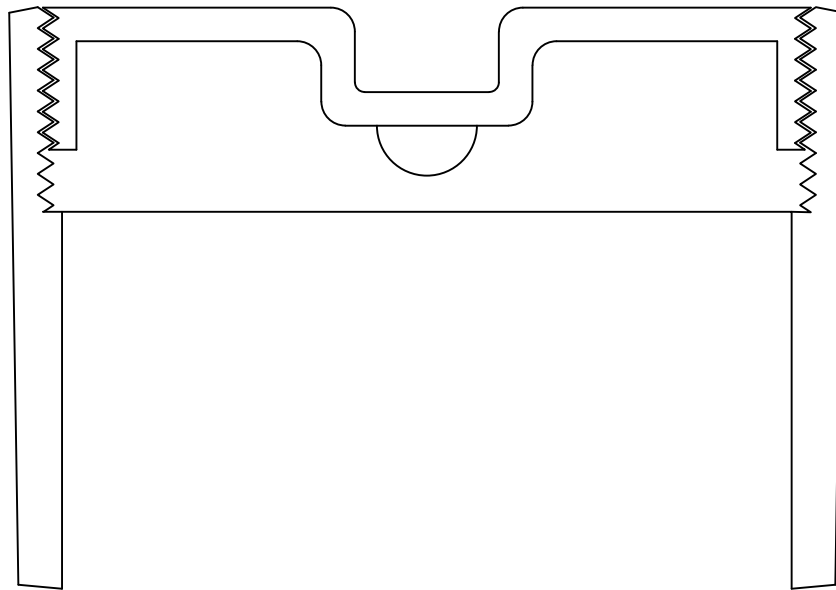
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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	MAIN EXTENSION TO TIE INTO TEE MANHOLE
--	----------------------------------------

S-33



STANDARD 4" BRONZE CLEANOUT PLUG



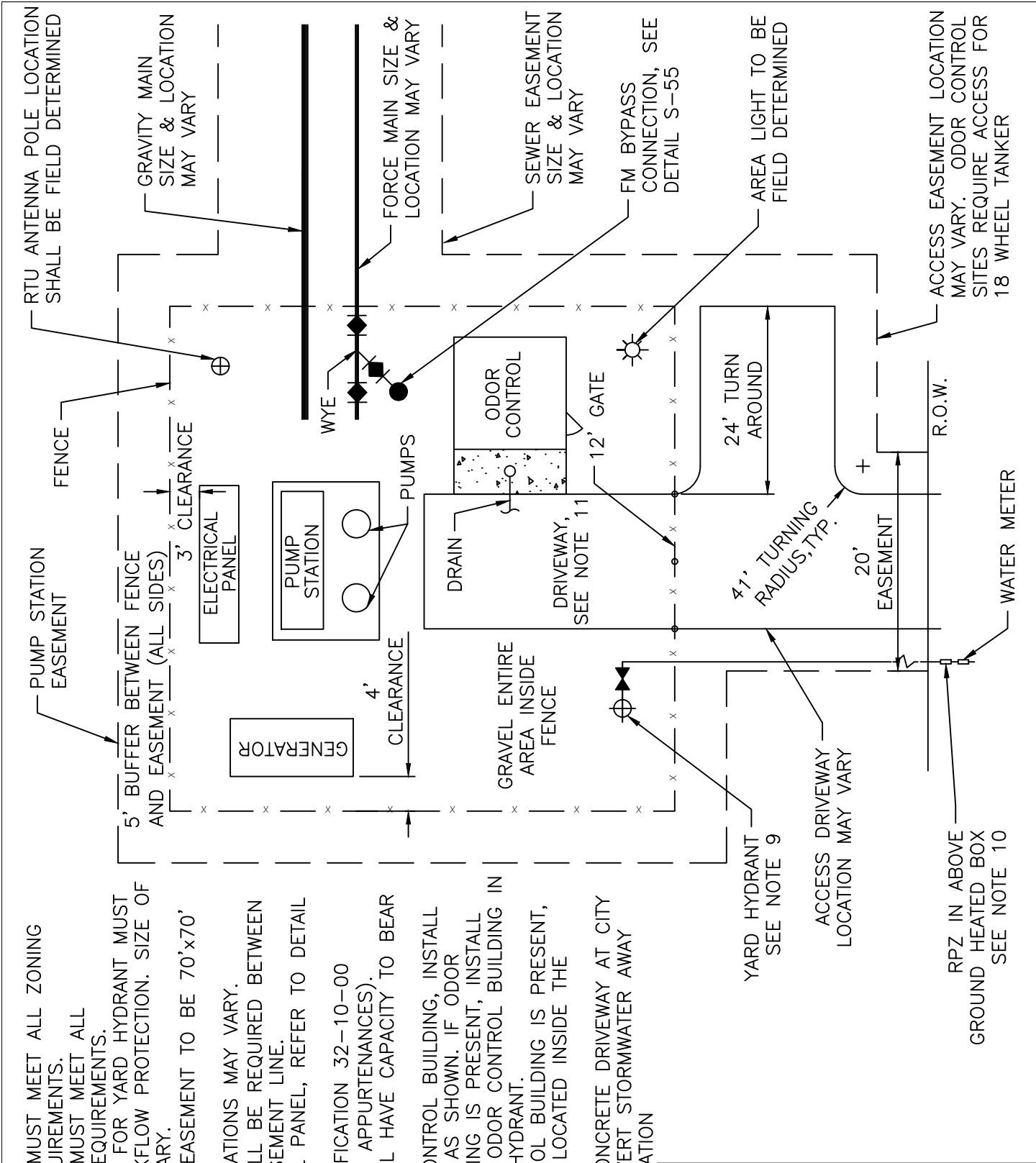
CLEANOUT FERRULE WITH PLUG

STYLES ACCEPTED:
 INVERTED NUT
 RAISED NUT

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	4" CLEANOUT PLUG	
	S-34	

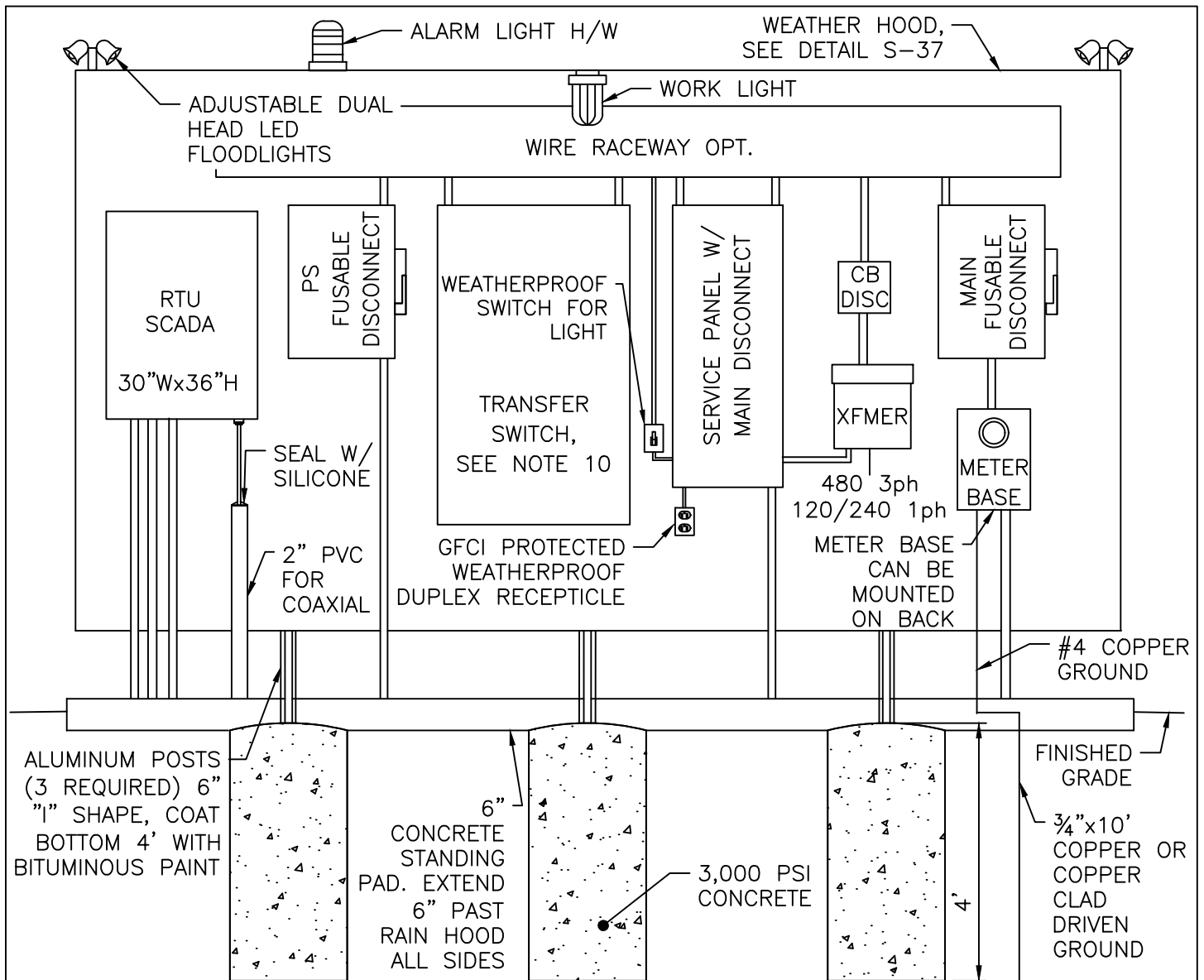
NOTES:

1. PUMP STATION MUST MEET ALL ZONING SET-BACK REQUIREMENTS.
2. PUMP STATION MUST MEET ALL LANDSCAPING REQUIREMENTS.
3. WATER SERVICE FOR YARD HYDRANT MUST HAVE RPZ BACKFLOW PROTECTION. SIZE OF SERVICE MAY VARY.
4. PUMP STATION EASEMENT TO BE 70'x70' MINIMUM.
5. EQUIPMENT LOCATIONS MAY VARY.
6. 5' BUFFER SHALL BE REQUIRED BETWEEN FENCE AND EASEMENT LINE.
7. FOR ELECTRICAL PANEL, REFER TO DETAIL S-36 & S-37.
8. SEE CITY SPECIFICATION 32-10-00 (PAVEMENT AND APPURTENANCES). PAVEMENT SHALL HAVE CAPACITY TO BEAR 88K G.V.W.
9. IF NO ODOR CONTROL BUILDING, INSTALL YARD HYDRANT AS SHOWN. IF ODOR CONTROL BUILDING IS PRESENT, INSTALL HOSE BIBB ON ODOR CONTROL BUILDING IN LIEU OF YARD HYDRANT.
10. IF ODOR CONTROL BUILDING IS PRESENT, RPZ SHALL BE LOCATED INSIDE THE BUILDING.
11. ASPHALT OR CONCRETE DRIVEWAY AT CITY DISCRETION. DIVERT STORMWATER AWAY FROM PUMP STATION



**CITY OF RALEIGH
STANDARD DETAIL**

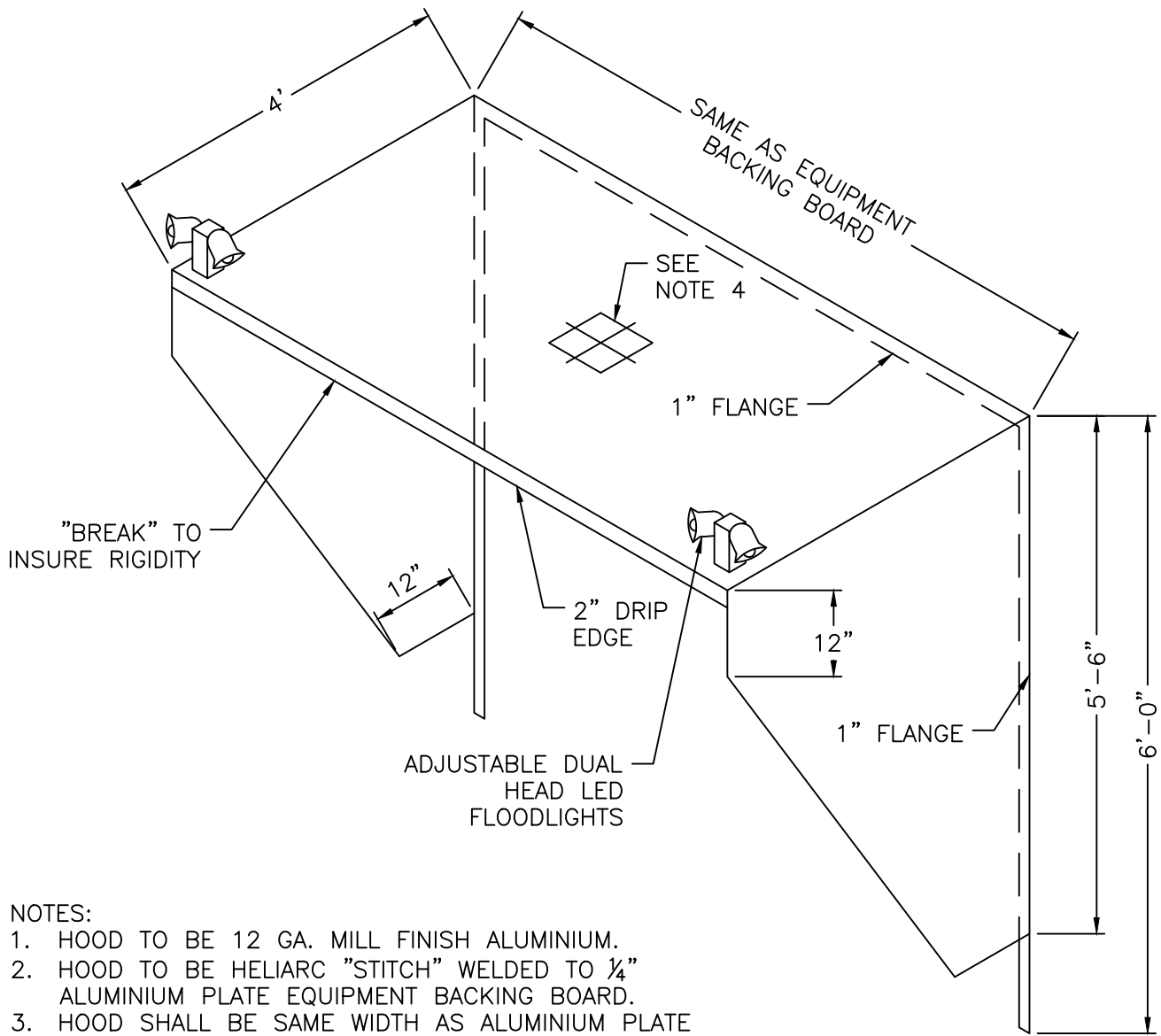
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
MINIMUM REQUIREMENTS FOR PUMP STATIONS		
S-35		



NOTES:

1. BACKING PLATE TO BE 1/4" ALUMINUM. MOUNT TO "1" BEAM POSTS WITH STAINLESS STEEL NUTS, BOLTS, AND WASHERS.
2. ALL ELECTRICAL WORK SHALL CONFORM TO LATEST NATIONAL, STATE AND LOCAL CODES AND REQUIREMENTS.
3. SHOW CONDUIT SIZE AND RUNS WITH WIRE SIZE AND NUMBER ON PUMP STATION PLANS.
4. PANEL LAYOUT IS SCHEMATIC ONLY. ADJUST AS NEEDED TO ACCOMMODATE EQUIPMENT. MAINTAIN 4" MIN. CLEARANCE BETWEEN PANELS AND SIDE SHIELDS.
5. ALL ENCLOSURES SHALL BE NEMA 4X RATED AND LOCKABLE.
6. ENCLOSURES SHALL BE MOUNTED TO ALUMINUM BACKING PLATE WITH NYLON SPACERS & STAINLESS STEEL NUTS, BOLTS & WASHERS.
7. CONDUIT SHALL BE RIDGID ALUMINUM OR GALVANIZED. MEYERS HUBS SHALL BE USED AT ALL PANEL CONNECTIONS.
8. NO EQUIPMENT SHALL BE MOUNTED LESS THAN 36" ABOVE FINISHED GRADE. MIN. CLEARANCE FROM WORK LIGHT TO STANDING PAD SHALL BE 6'-6".
9. CONDUITS FROM WET WELL SHALL HAVE AN AIR GAP FROM TERMINATING CABINET.
10. INSTALL AN AUTOMATIC TRANSFER SWITCH IF A GENERATOR IS INSTALLED. INSTALL A MANUAL TRANSFER SWITCH IF A PERMANENT DRY PRIME BYPASS BACK UP PUMPING SYSTEM IS INSTALLED. ADD A MELTRIC PLUG OR EQUAL TO THE MANUAL TRANSFER SWITCH FOR CONNECTION TO A PORTABLE GENERATOR.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	PUMP STATION ELECTRICAL PANEL	
	S-36	

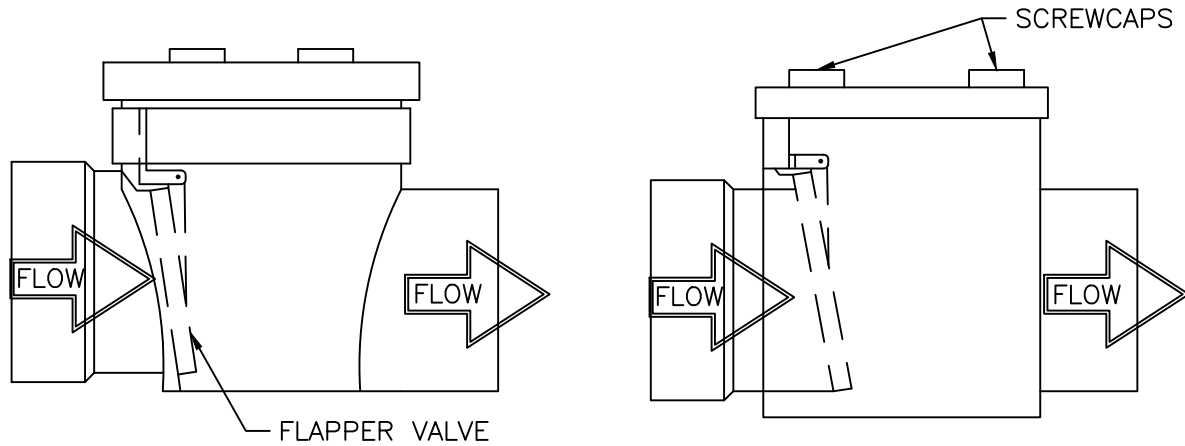


NOTES:

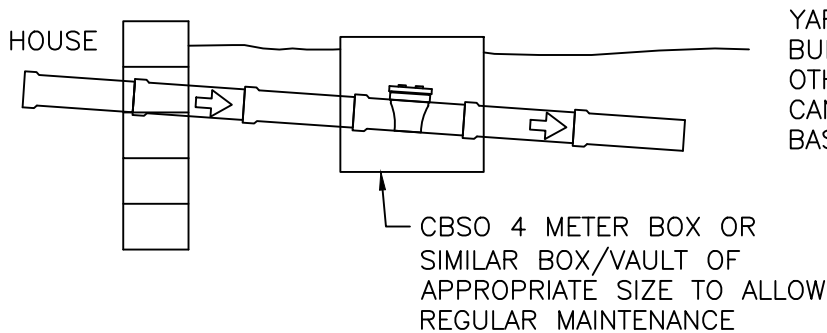
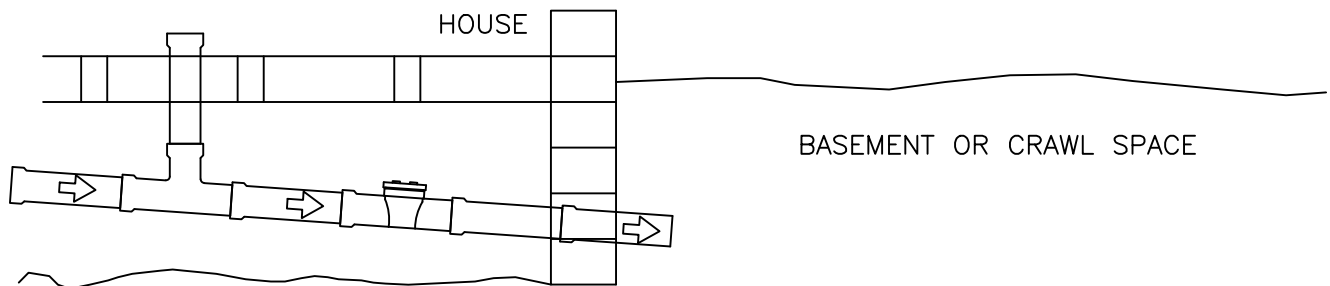
1. HOOD TO BE 12 GA. MILL FINISH ALUMINIUM.
2. HOOD TO BE HELIARC "STITCH" WELDED TO 1/4" ALUMINIUM PLATE EQUIPMENT BACKING BOARD.
3. HOOD SHALL BE SAME WIDTH AS ALUMINIUM PLATE EQUIPMENT BACKING BOARD.
4. PROVIDE MOUNTING TABS FOR WORK LIGHT BOX.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	WEATHER HOOD FOR ELECTRICAL EQUIPMENT	
	S-37	

TYPICAL SANITARY SEWER SERVICE BACKWATER VALVE STYLES:



TYPICAL BACKWATER VALVE INSTALLATIONS:

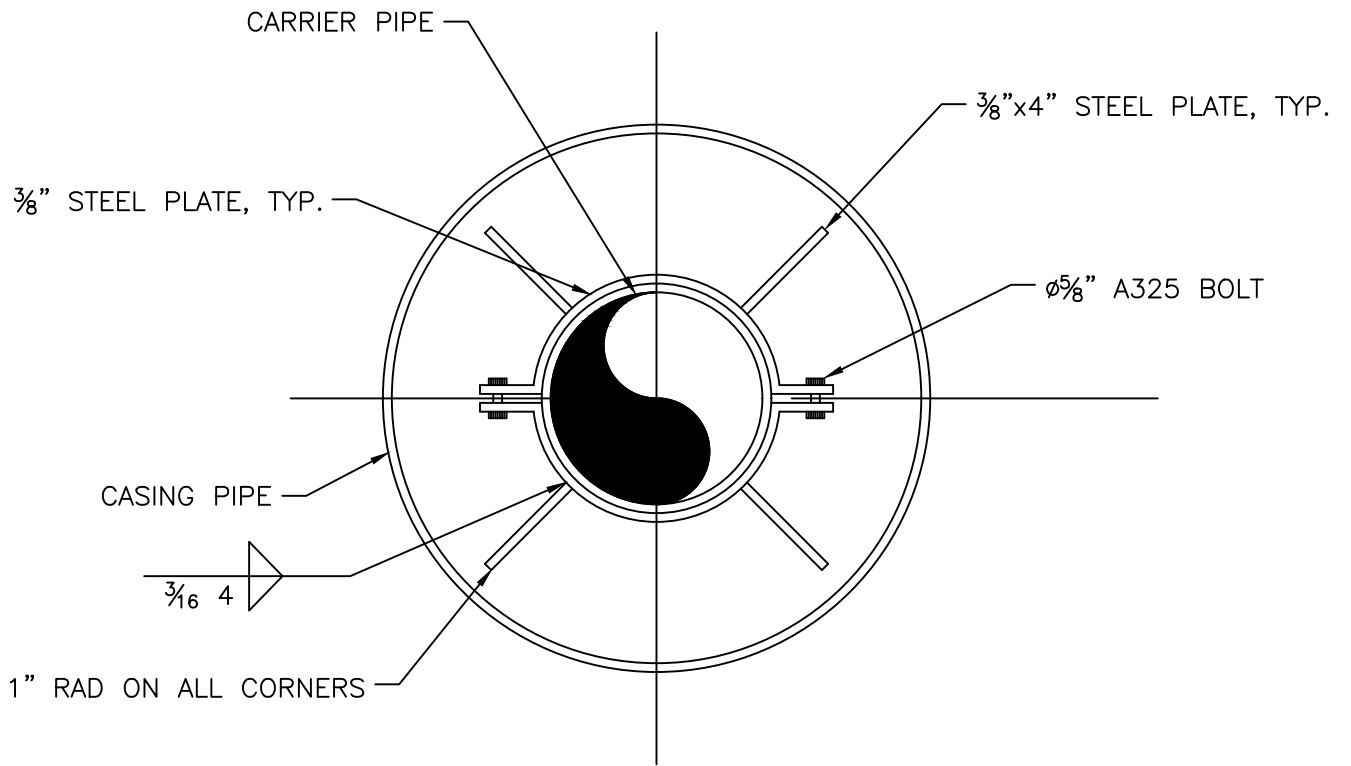


YARD/VAULT INSTALLATION FOR BUILDINGS BUILT ON SLAB AND OTHER LOCATIONS WHERE VALVE CANNOT BE INSTALLED IN BASEMENT OR CRAWL SPACE.

NOTES:

1. INSTALLATIONS OF GREATER THAN 4' IN DEPTH MAY REQUIRE MANHOLE.
2. VALVES MUST BE INSTALLED IN A LOCATION AT WHICH THEY CAN BE CLEANED AND SERVICED REGULARLY.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	TYPICAL SANITARY SEWER SERVICE BACKWATER VALVE INSTALLATION	
	S-38	



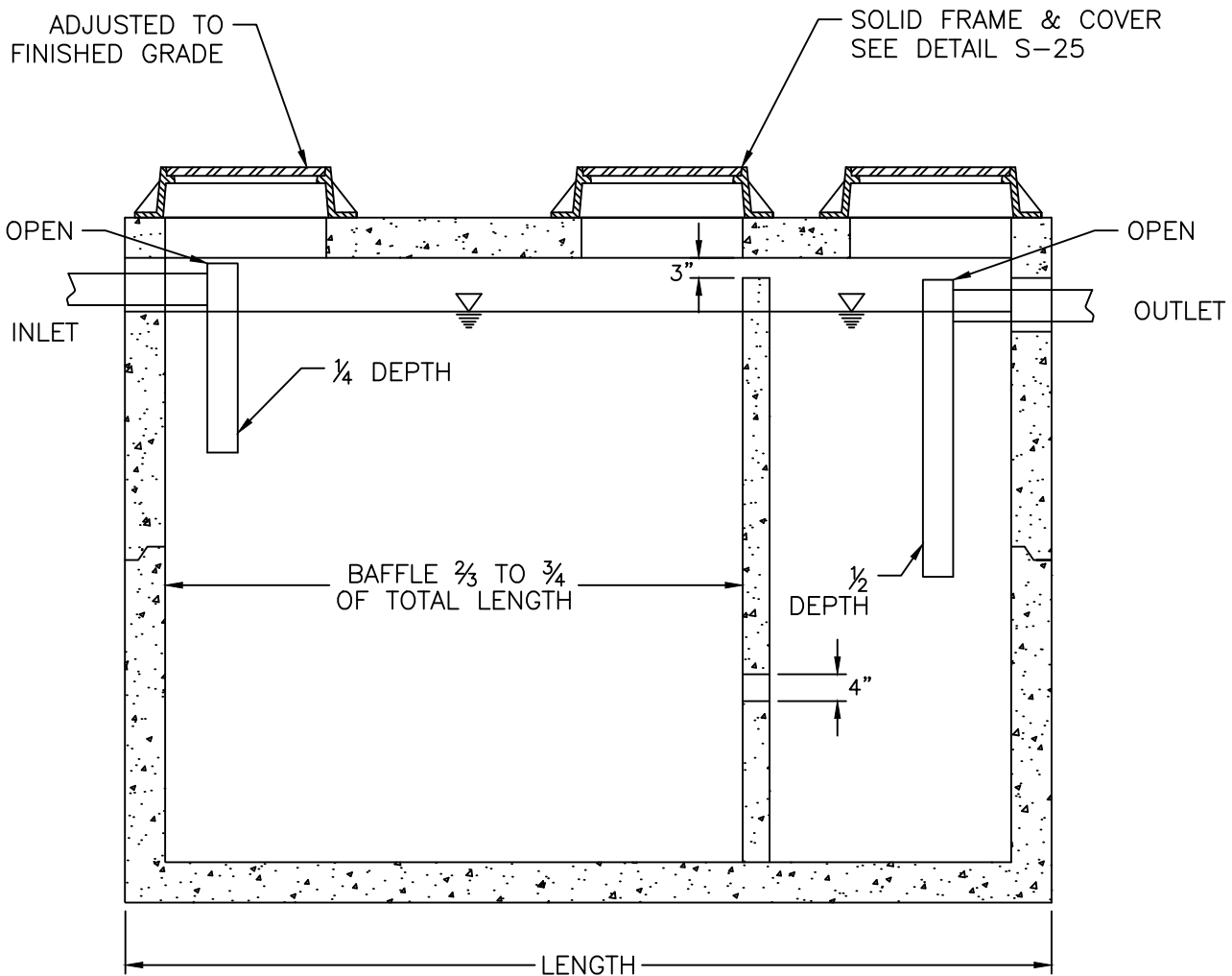
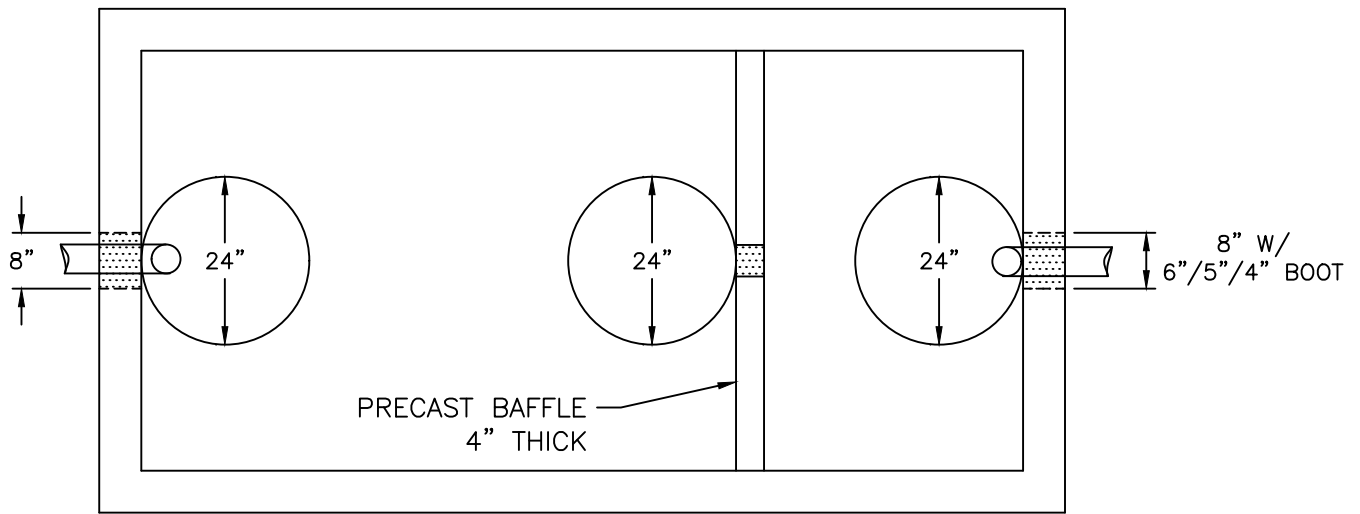
NOTE:
 USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE
 PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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	PIPE ALIGNMENT GUIDE

S-39



- NOTES:
1. REINFORCEMENT: H-20 BRIDGE LOADING (TRAFFIC RATED).
 2. CONCRETE: 4,000 PSI @ 28 DAYS.
 3. EARTHCOVER: 0' TO 5' MAX.
 4. HDPE ALLOWED IN LIEU OF CONCRETE. MEET SAME LOADING REQUIREMENTS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 01/18/2025 NOT TO SCALE

1,000 GALLON
GREASE INTERCEPTOR

S-40

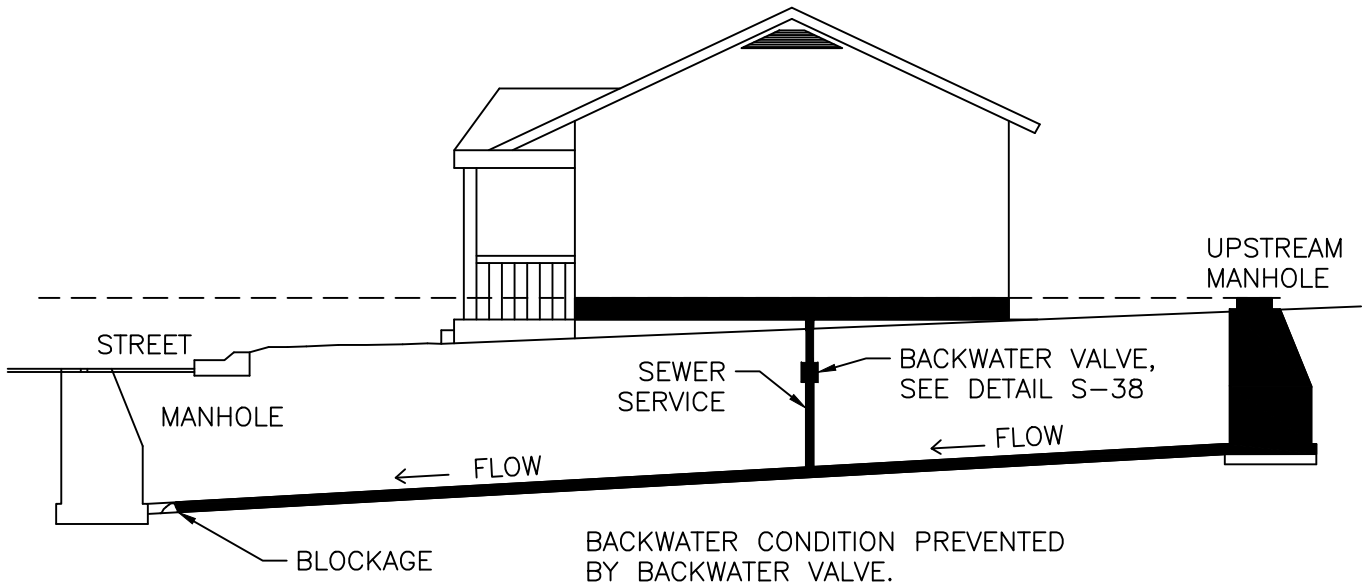
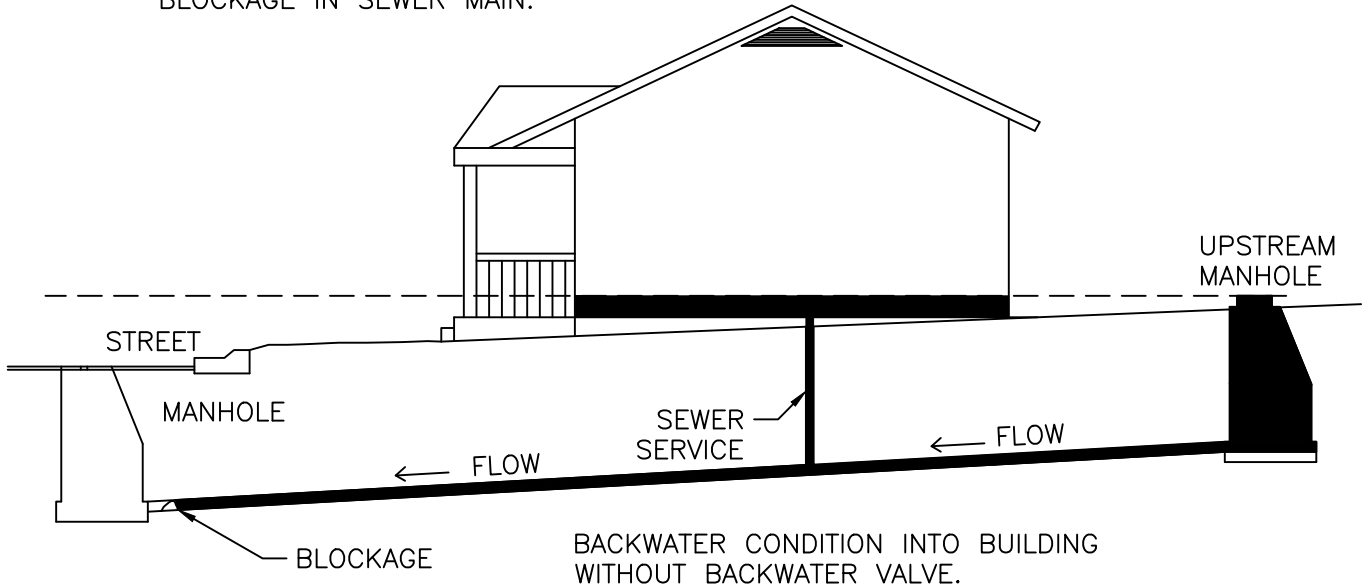
LOCALLY AVAILABLE SIZES	
INTERCEPTORS CAPACITY (GAL.)	SEPARATORS CAPACITY (GAL.)
300	1,000
550	1,200
750	1,600
1,000	
1,200	
1,500	
2,000	
2,500	
3,000	
4,000	
5,000	
6,000	
8,000	

NOTES:

1. BAFFLE WALLS LOCATED AT A DISTANCE FROM INLET WALL $\frac{2}{3}$ TO $\frac{3}{4}$ OF THE TOTAL LENGTH OF THE INTERCEPTOR OR SEPARATOR AS SHOWN ON DETAIL S-40. BAFFLE WALLS LOCATED AT A DISTANCE APPROXIMATELY OF $\frac{1}{3}$ OF THE TOTAL LENGTH OF THE SEPARATOR AS SHOWN ON DETAIL S-40A.
2. EACH INTERCEPTOR OR SEPARATOR SHALL HAVE INLET AND OUTLET TEES. THE OUTLET TEE SHALL EXTEND 50% INTO THE LIQUID DEPTH. THE INLET TEE SHALL EXTEND 25% INTO THE LIQUID DEPTH. INLET AND OUTLET TEES MUST BE OPEN TO ALLOW THE COLLECTION OF F.O.G. SAMPLE.
3. ACCESS OPENINGS OVER EACH COMPARTMENT WITHIN THE INTERCEPTOR OR SEPARATOR SHALL BE 24 INCHES IN DIAMETER AND CONTAIN PICK HOLES. ALL COVERS SHALL BE CONSTRUCTED OF CAST IRON OR EQUIVALENT TRAFFIC BEARING MATERIAL. MANHOLE COVERS MUST EXTEND TO FINISH GRADE AND BE INSTALLED TO EXCLUDE THE ENTRANCE OF STORMWATER INTO THE INTERCEPTOR OR SEPARATOR.
4. FULL SIZE DUAL SWEEP CLEANOUTS SHALL BE INSTALLED ON THE INLET AND OUTLET SIDES OF THE INTERCEPTOR OR SEPARATOR.
5. INTERCEPTORS AND SEPARATORS MUST BE VENTED IN ACCORDANCE WITH THE NC STATE PLUMBING CODE.
6. CONCRETE: 4,000 PSI @ 28 DAYS.
7. DESIGN: ACI 318 BUILDING CODE
 ASTM C1613-06 FOR GREASE INTERCEPTORS
 ASTM C913-02 FOR WATER AND WASTEWATER STRUCTURES
 ASTM C890-06 FOR MINIMAL STRUCTURAL DESIGN LOADING
8. INTERCEPTORS AND SEPARATORS SHALL BE DESIGNED TO WITHSTAND AN H-20 WHEEL LOAD.
9. INTERCEPTORS OR SEPARATORS MADE OF POLYETHYLENE OR FIBERGLASS SHALL INCLUDE A MINIMUM 12,000 PSI TENSILE STRENGTH, 19,000 PSI FLEXURAL STRENGTH, AND 800,000 PSI FLEXURAL MODULUS.
10. ALL INTERCEPTORS AND SEPARATORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.

CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
	DIMENSIONS: GREASE INTERCEPTORS & OIL-WATER SAND SEPARATORS	
	S-41	

BUILDING WITH NEXT UPSTREAM MANHOLE
HIGHER THAN THE LOWEST DRAIN AND
BLOCKAGE IN SEWER MAIN.



CITY OF RALEIGH
STANDARD DETAIL

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	TYPICAL SEWER SERVICE REQUIRING BACKWATER VALVE
--	-------------------------------------------------

S-42

NOT USED

CITY OF RALEIGH		
STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 01/18/2025</i>	<i>NOT TO SCALE</i>
		NOT USED
		S-43

CONTINUOUS RIDGE VENT

25 YR. ASPHALT
SHINGLES, BLDG FELT,
1/2" CDX PLYWOOD

8" CMU.
FILL WITH
INSULATION

3'x7' 18GA.
INS. STEEL
DOOR

**CITY OF RALEIGH
STANDARD DETAIL**

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STANDARD ODOR CONTROL
BLDG. SIDE ELEVATION

S-45

CEILING MOUNT 1500W
ELECTRIC UNIT HEATER
W/INTEGRAL THERMOSTAT

WALL MOUNTED
EXHAUST FAN

INTAKE
LOUVERED
VENT

4' INDUSTRIAL
FLUORESCENT
LIGHT FIXTURE

DOUBLE WALL
CHEMICAL TANK

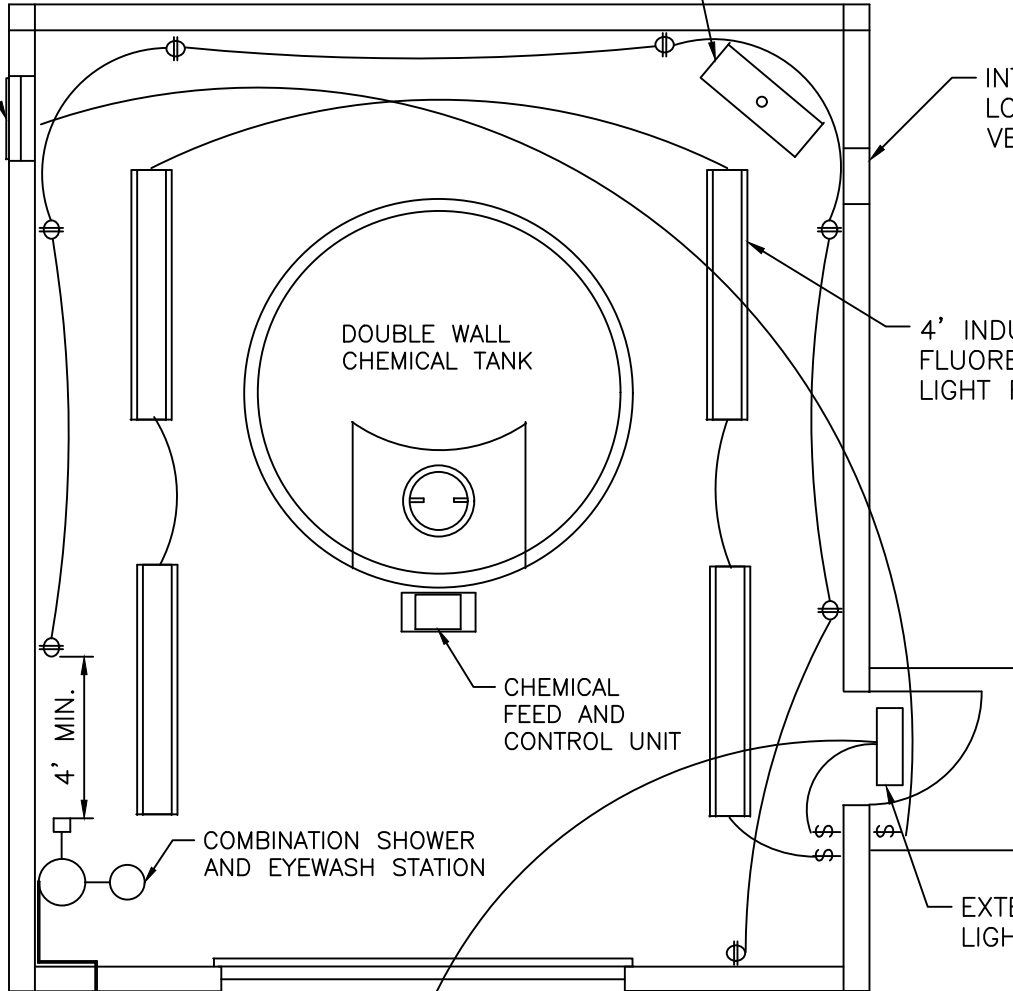
CHEMICAL
FEED AND
CONTROL UNIT

COMBINATION SHOWER
AND EYEWASH STATION

EXTERIOR
LIGHT

NON-FREEZE
HOSE BIBB

EXTERIOR LIGHT



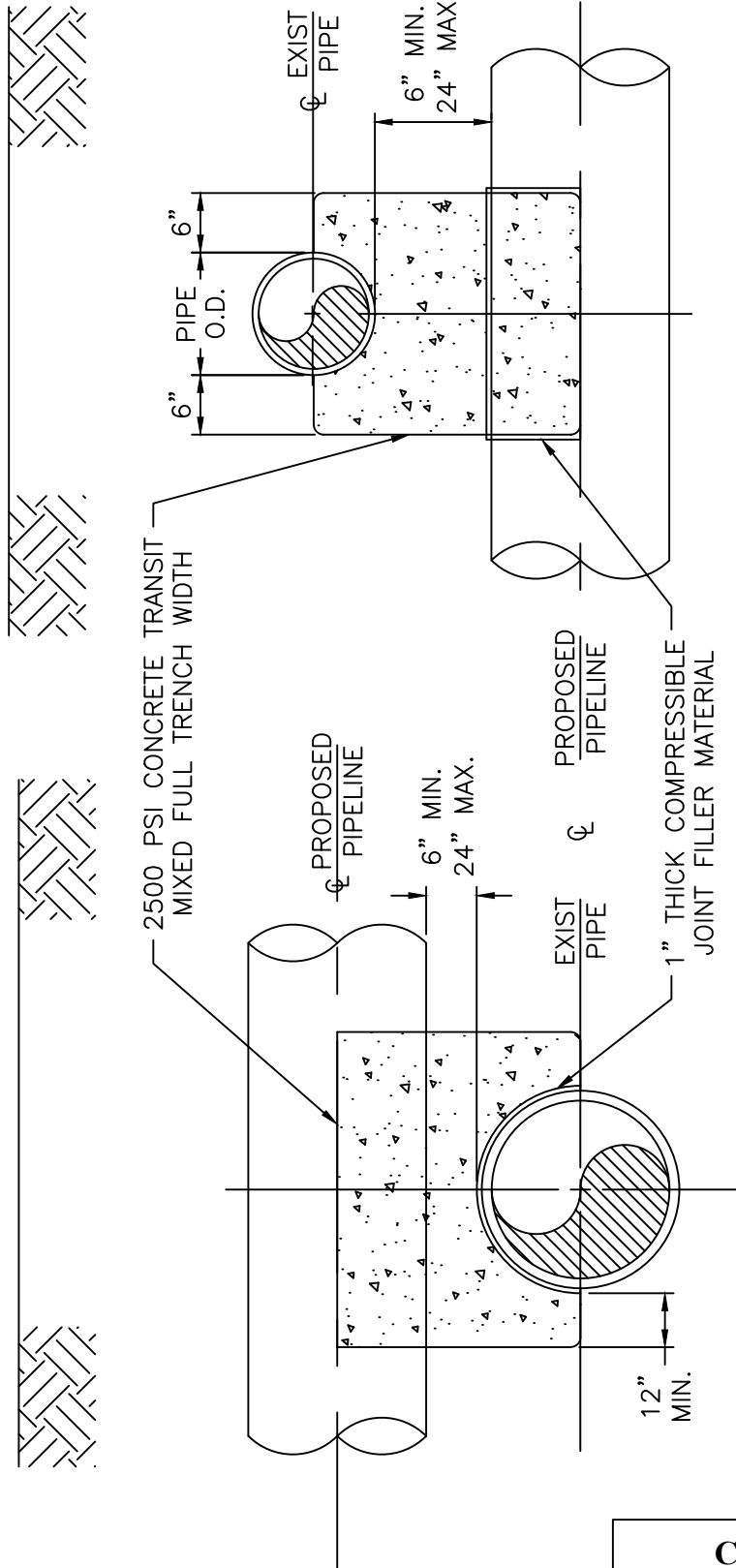
**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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	STANDARD ODOR CONTROL BLDG. MECHANICAL & ELECTRICAL
--	-----------------------------------------------------------

S-47

NOTE:
NO ENCASEMENT REQUIRED FOR SPACE
GREATER THAN 24" FOR SEWER LINES.



PROPOSED PIPELINE OVER
EXISTING PIPE

PROPOSED PIPELINE
UNDER EXISTING PIPE

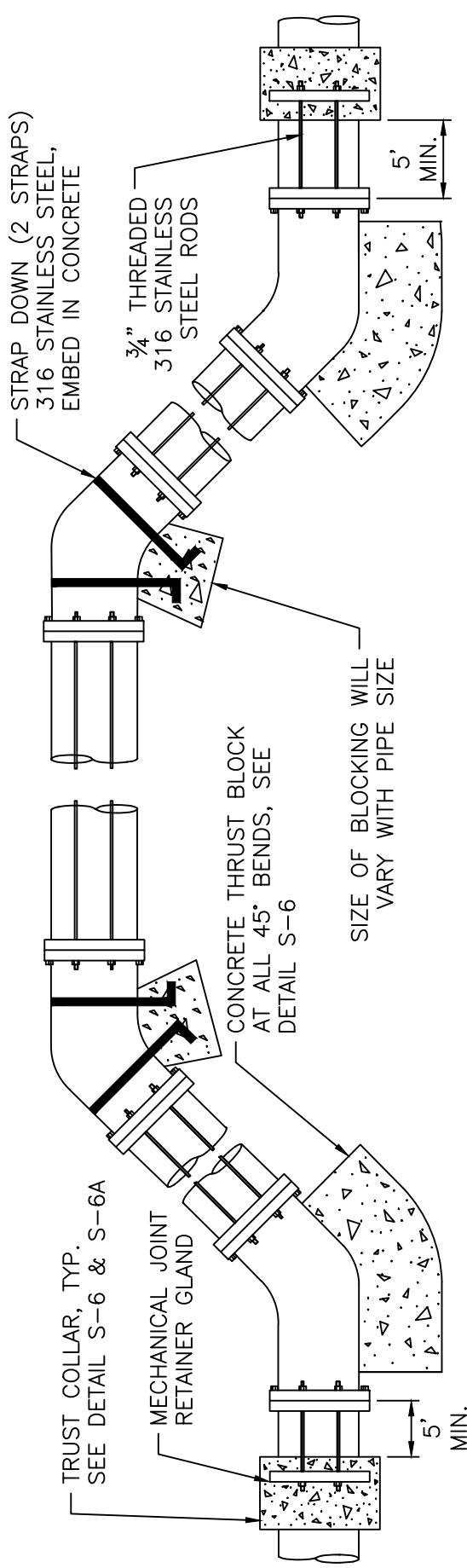
**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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CONCRETE CRADLE
PROTECTION FOR SEWER
LINE CROSSINGS

S-49

TOP OF GROUND



ROD REQUIREMENTS

SIZE OF 45° BEND	STATIC TRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

STRAP REQUIREMENTS

STRAP WIDTH	STRAP THICKNESS
1"	3/16"
1.5"	3/16"
2"	1/4"
2"	1/2"
4"	1/2"

RESTRAINT REQUIREMENTS

PIPE DIA	RODDING	RJ GLANDS	THRUST COLLAR	THRUST BLOCKING
<12"	X	X	X	
≥12"	X	X	X	X

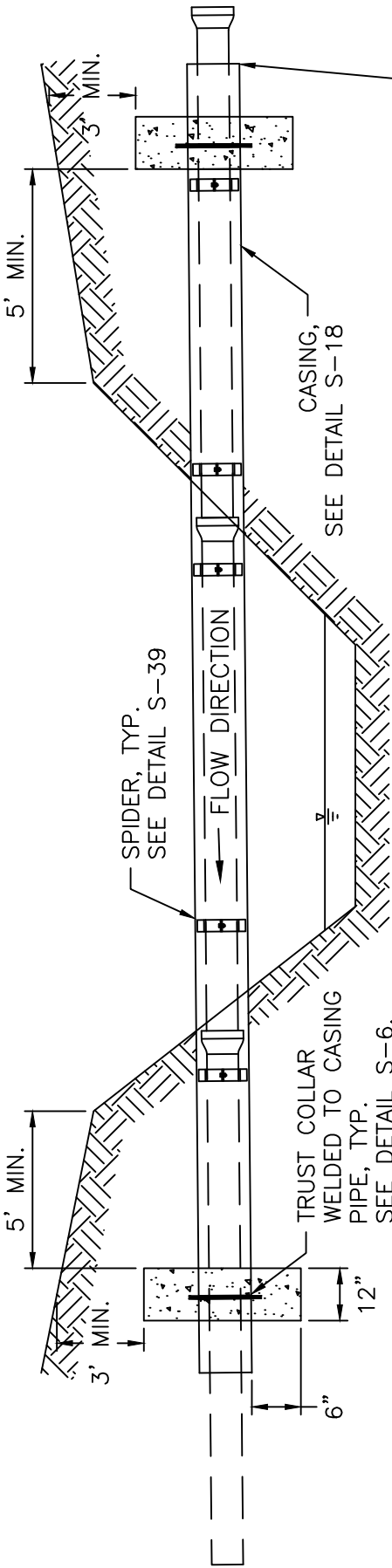
"X" DENOTES REQUIRED RESTRAINT.

NOTES:

1. STEEL RODS AND BOLTS SHALL BE 3/4" 316 STAINLESS STEEL.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3' MINIMUM COVER MUST BE MAINTAINED.
6. EXTERNAL RESTRAINT REQUIRED. INTEGRAL BELL RESTRAINT REQUIRES DIRECTOR'S APPROVAL.

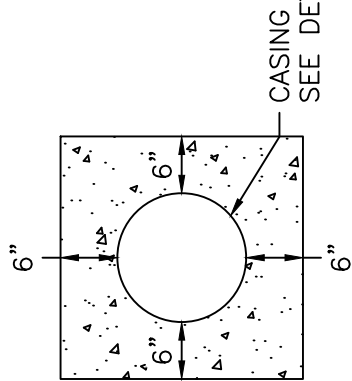
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
STANDARD VERTICAL BEND		
S-50		



PROFILE VIEW

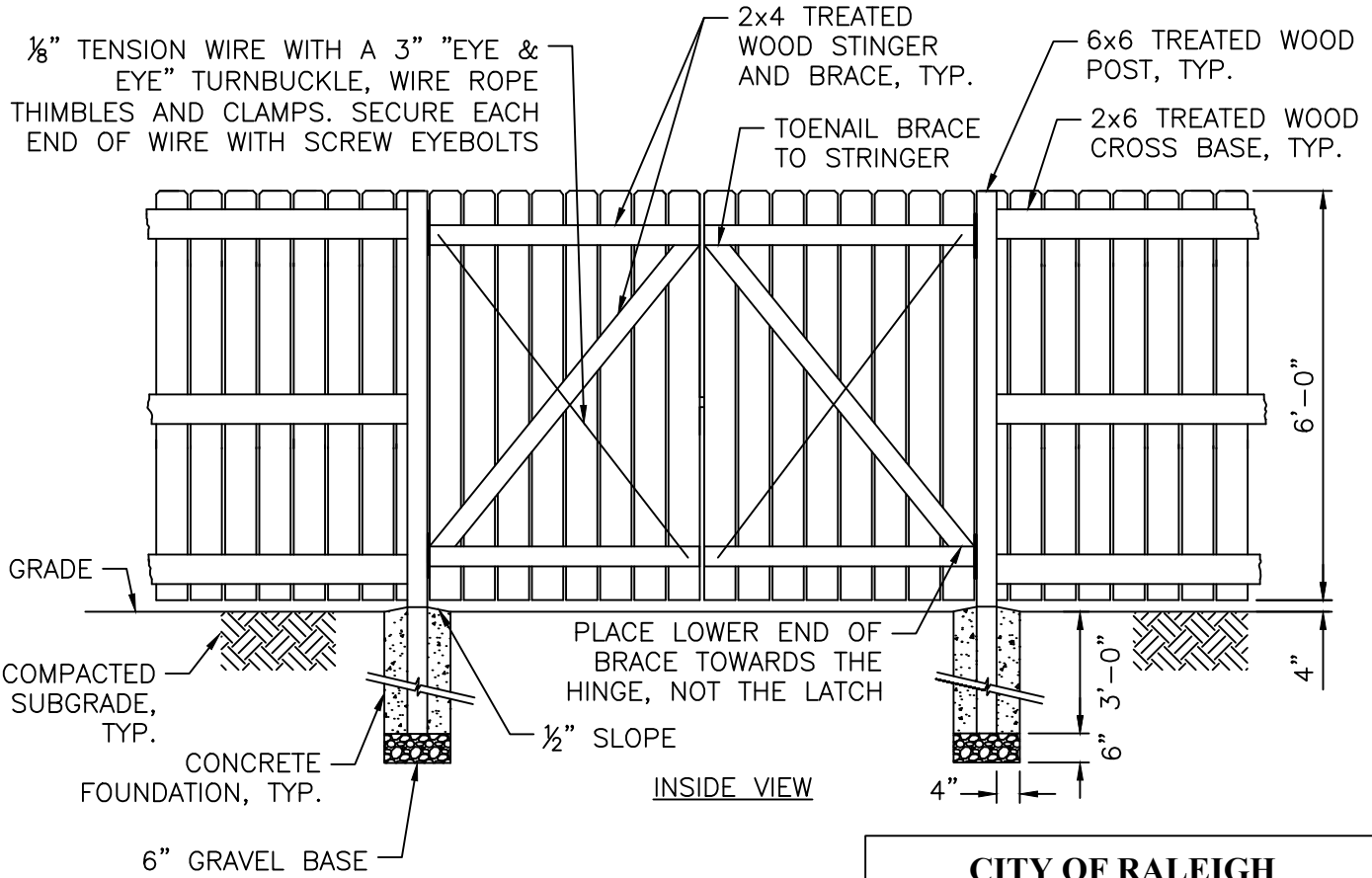
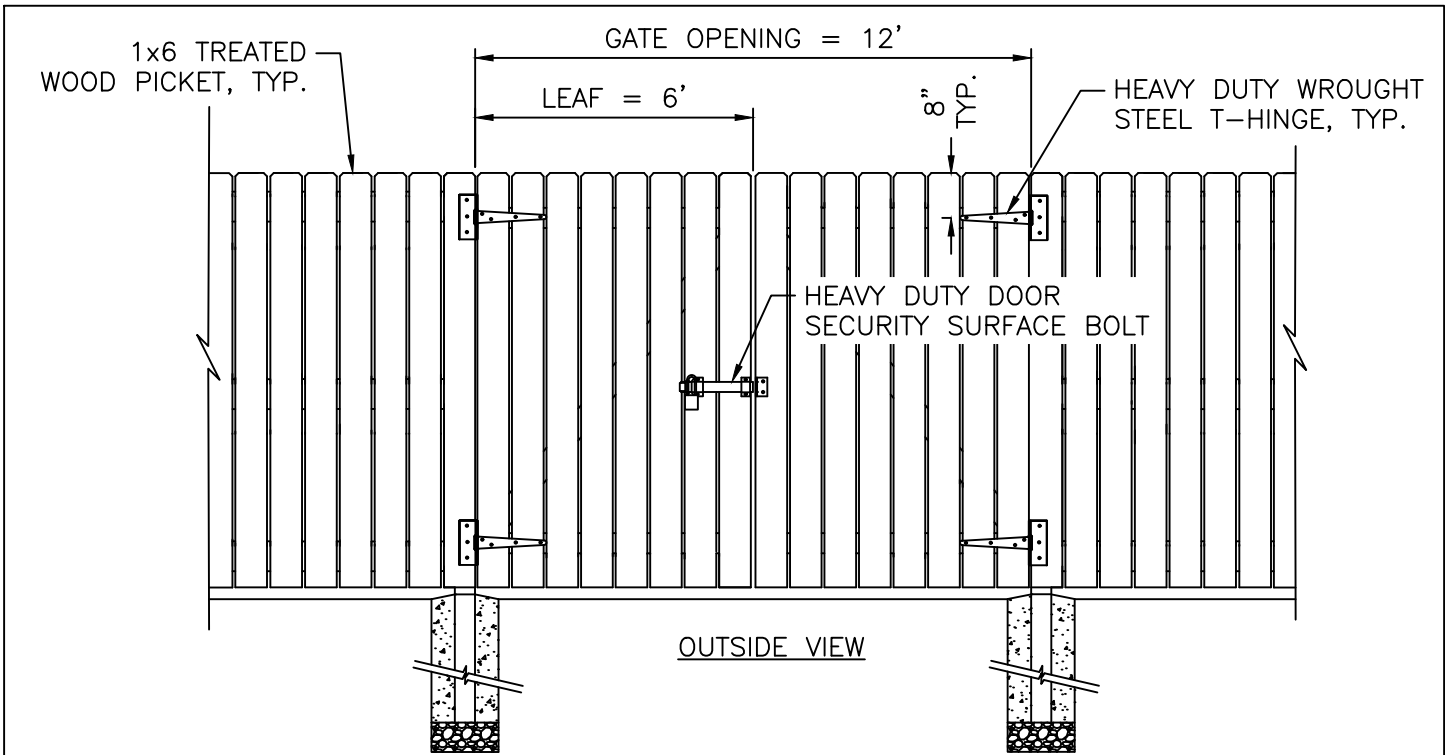
GROUT CASING ENDS, SEE DETAIL S-18. 1" DRAIN INTO WASHED STONE REQUIRED AT LOW END



CONCRETE COLLAR

- NOTES:
1. FOR CROSSINGS OF LESS THAN 10' NO CASING IS REQUIRED IF THE JOINT OF PIPE IS CENTERED ON THE CROSSING.
 2. THRUST COLLAR MAY BE FIELD WELDED ON STEEL CASING PIPE. IF NO CASING IS REQUIRED THE THRUST COLLAR MUST BE FACTORY WELDED ON DIP CARRIER PIPE.

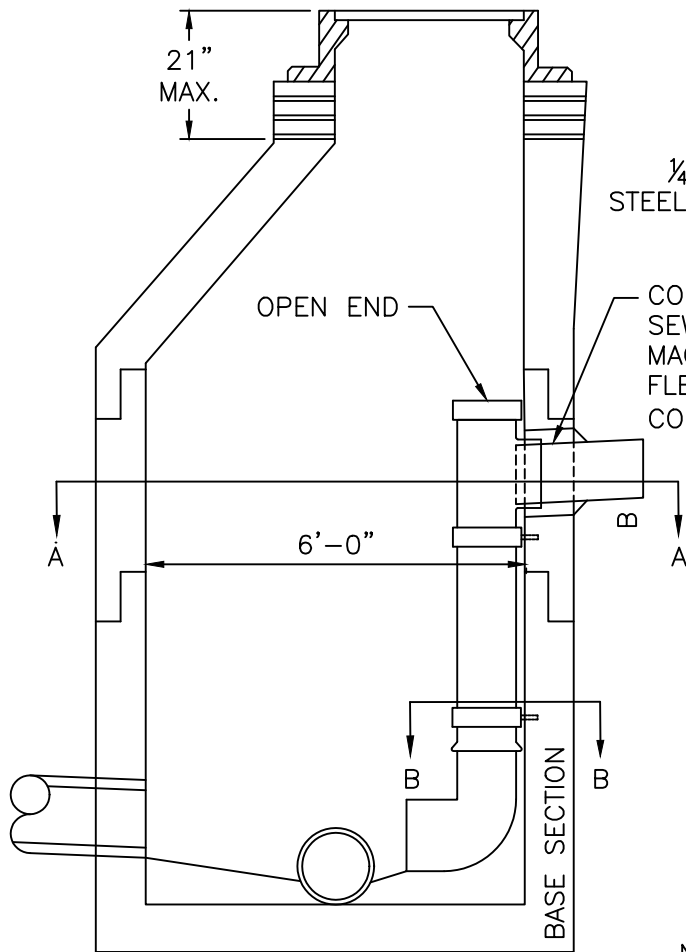
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	AERIAL SEWER SERVICE	
	S-51	



- NOTES:
1. INSTALL 1x6 BOARDS VERTICALLY.
 2. 2x6'S MAY SLOPE OR BE HORIZONTAL TO ACCOUNT FOR GRADE CHANGES.
 3. SPACE 1x6 BOARDS EQUALLY (3/8" MAX).

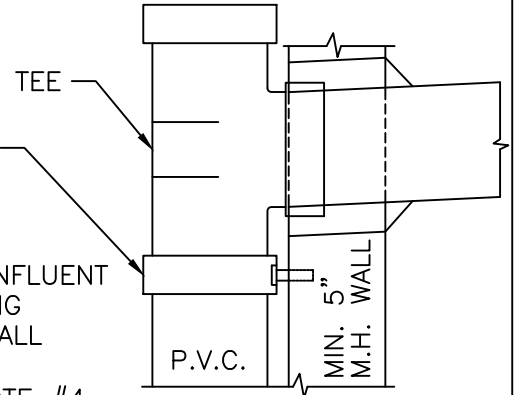
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
		WOODEN FENCE GATE
		S-52

4" MIN. VERTICAL CLEARANCE FROM MANHOLE WALL JOINT

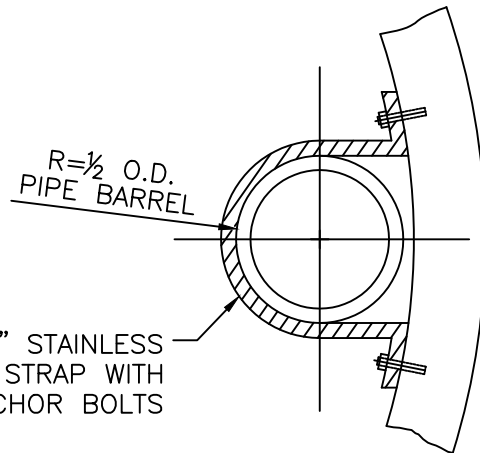


1/4"x2" STAINLESS STEEL STRAP WITH 2 ANCHOR BOLTS

CORE HOLE FOR INFLUENT SEWER WITH CORING MACHINE AND INSTALL FLEXIBLE RUBBER COUPLING, SEE NOTE #4



ENLARGED DETAIL

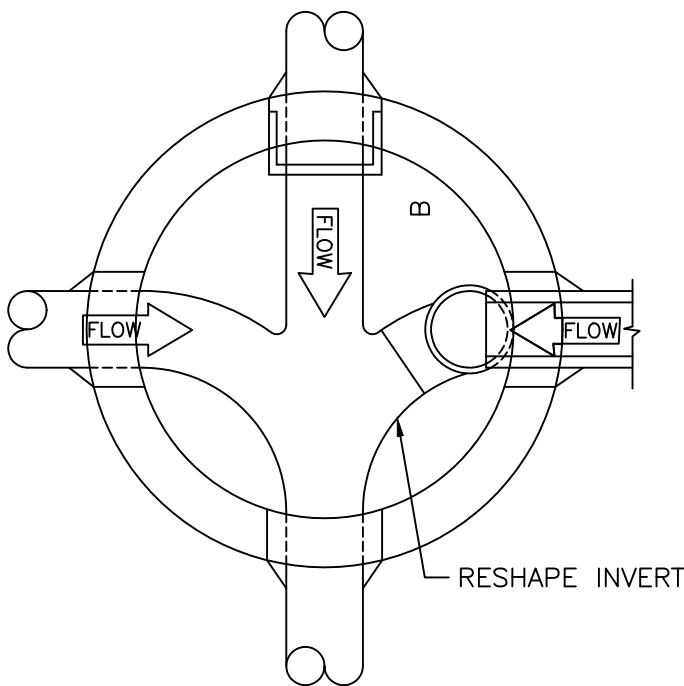


1/4"x2" STAINLESS STEEL STRAP WITH 2 ANCHOR BOLTS

SECTION B-B

NOTES:

1. PIPE FOR INSIDE DROP SHALL BE SDR 35 PVC CONFORMING TO ASTM SPECIFICATION D3034.
2. BOTTOM BEND TO BE 90° SHORT BEND, BELL SPIGOT, OF SDR 35 PVC. SPIGOT OF BEND TO REST DIRECTLY ON EXISTING SHELF. CONSTRUCT MASONRY TROUGH FROM DROP EFFLUENT TO MAIN CHANNEL.
3. LOCATE STRAPS AT TEE AND ABOVE BELL OF 90° BEND AS SHOWN. ADD EXTRA STRAPS AS NECESSARY TO MAINTAIN MAXIMUM SPACING OF TEN FEET.
4. HOLE IN MANHOLE WALL TO BE MADE WITH A CORING MACHINE. INSTALL FLEXIBLE RUBBER COUPLING.
5. CORE HOLE SHALL NOT ENTER CONE SECTION.



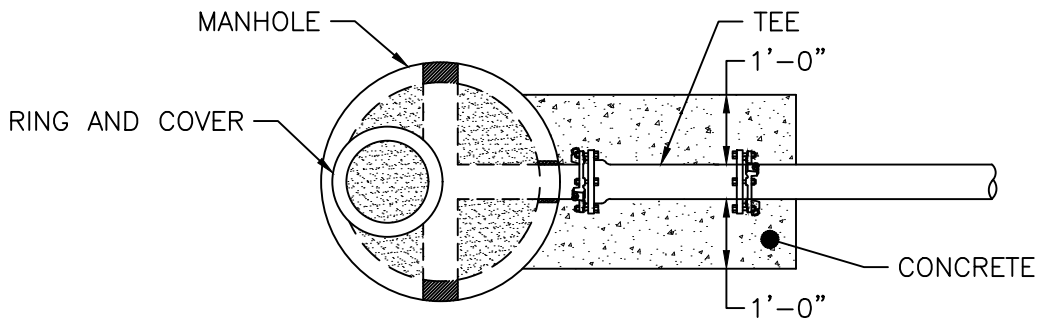
SECTION A-A

**CITY OF RALEIGH
STANDARD DETAIL**

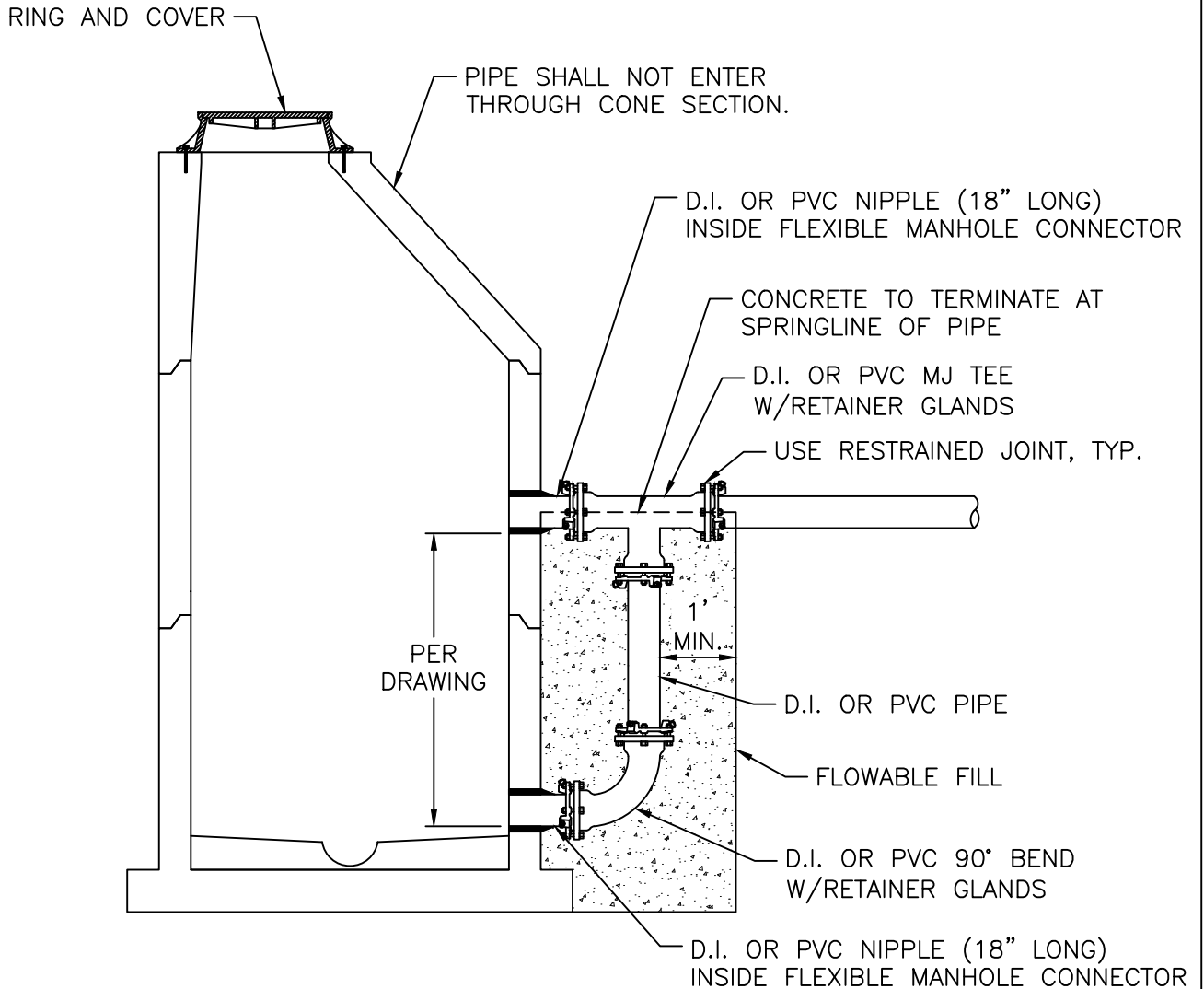
REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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INSIDE DROP MANHOLE

S-53



PLAN VIEW



SECTION VIEW

NOTES:

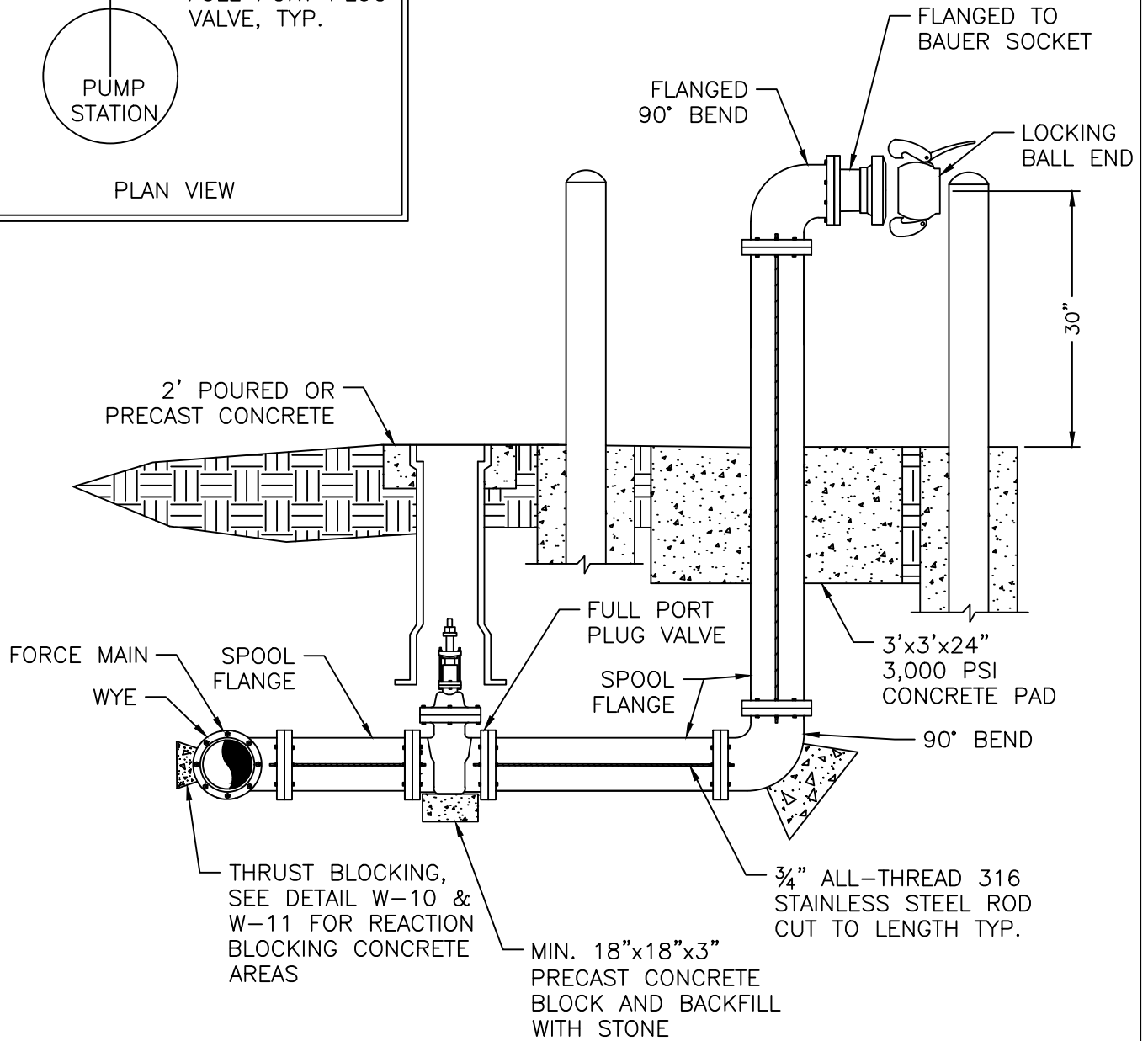
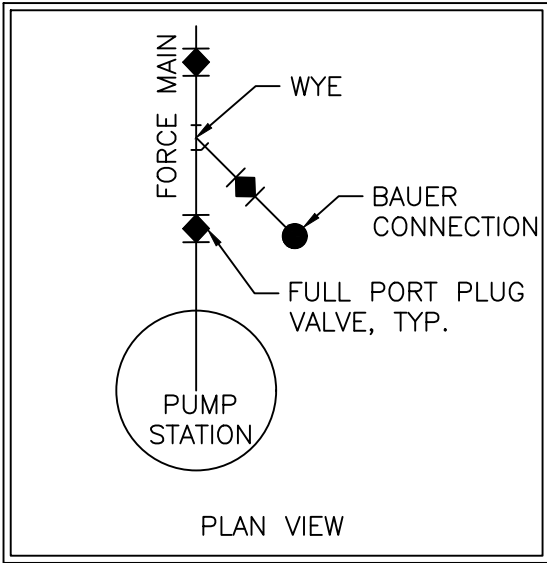
1. ENCASE ENTIRE DROP ASSEMBLY IN CONCRETE. 1' MINIMUM CONC. COVER ON EACH SIDE AND BOTTOM.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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OUTSIDE DROP MANHOLE

S-54

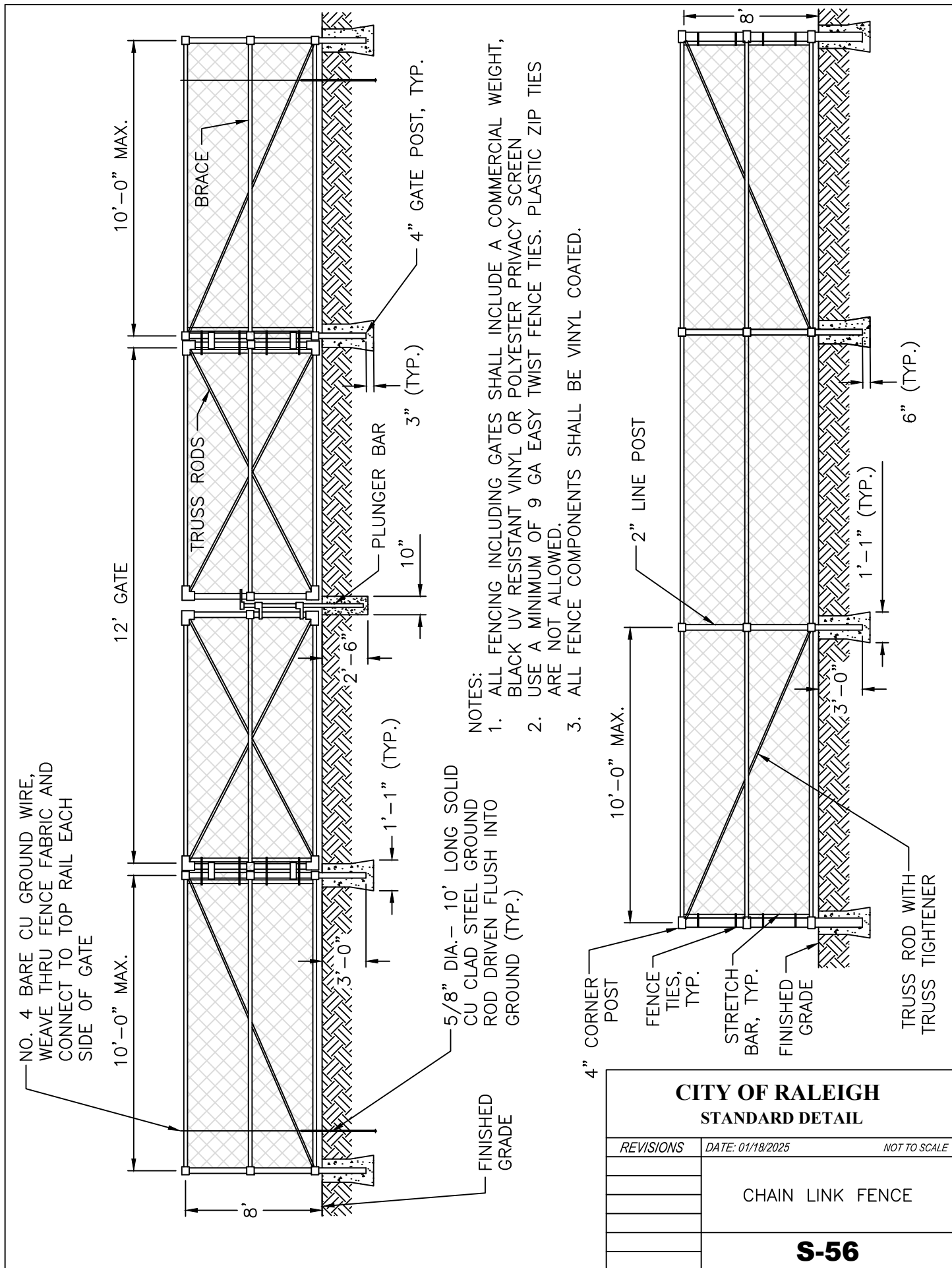


NOTES:

1. BYPASS DIAMETER SHALL MATCH FM DIAMETER UNLESS APPROVED BY RALEIGH WATER.
2. THE DESIGN ENGINEER SHALL LAYOUT BYPASS CONNECTION RISER TO PREVENT MAINTENANCE ACCESS CONFLICTS WITH THE PUMP STATION.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
	BYPASS CONNECTION FOR PUMP STATIONS AND FORCE MAINS	
S-55		



NO. 4 BARE CU GROUND WIRE,
WEAVE THRU FENCE FABRIC AND
CONNECT TO TOP RAIL EACH
SIDE OF GATE

10'-0" MAX.

12' GATE

10'-0" MAX.

BRACE

TRUSS RODS

10"

3'-0"

1'-1" (TYP.)

3'-0"

8"

FINISHED GRADE

5/8" DIA. - 10' LONG SOLID
CU CLAD STEEL GROUND
ROD DRIVEN FLUSH INTO
GROUND (TYP.)

PLUNGER BAR

3" (TYP.)

4" GATE POST, TYP.

5/8" DIA. - 10' LONG SOLID
CU CLAD STEEL GROUND
ROD DRIVEN FLUSH INTO
GROUND (TYP.)

NOTES:

1. ALL FENCING INCLUDING GATES SHALL INCLUDE A COMMERCIAL WEIGHT, BLACK UV RESISTANT VINYL OR POLYESTER PRIVACY SCREEN
2. USE A MINIMUM OF 9 GA EASY TWIST FENCE TIES. PLASTIC ZIP TIES ARE NOT ALLOWED.
3. ALL FENCE COMPONENTS SHALL BE VINYL COATED.

10'-0" MAX.

2" LINE POST

FENCE
TIES,
TYP.

8"

STRETCH
BAR, TYP.

FINISHED
GRADE

3'-0"

1'-1" (TYP.)

6" (TYP.)

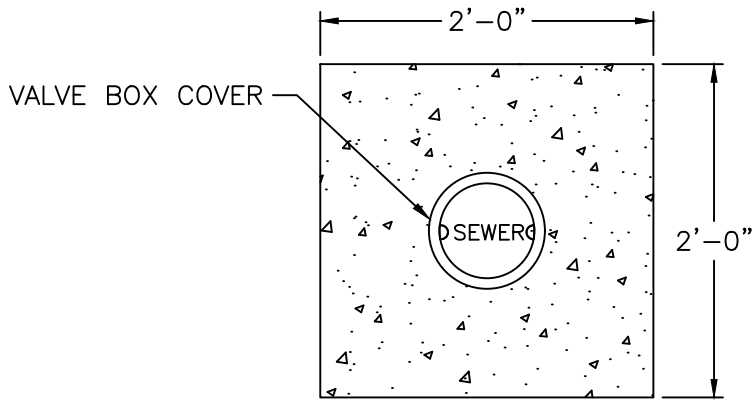
**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 01/18/2025	NOT TO SCALE
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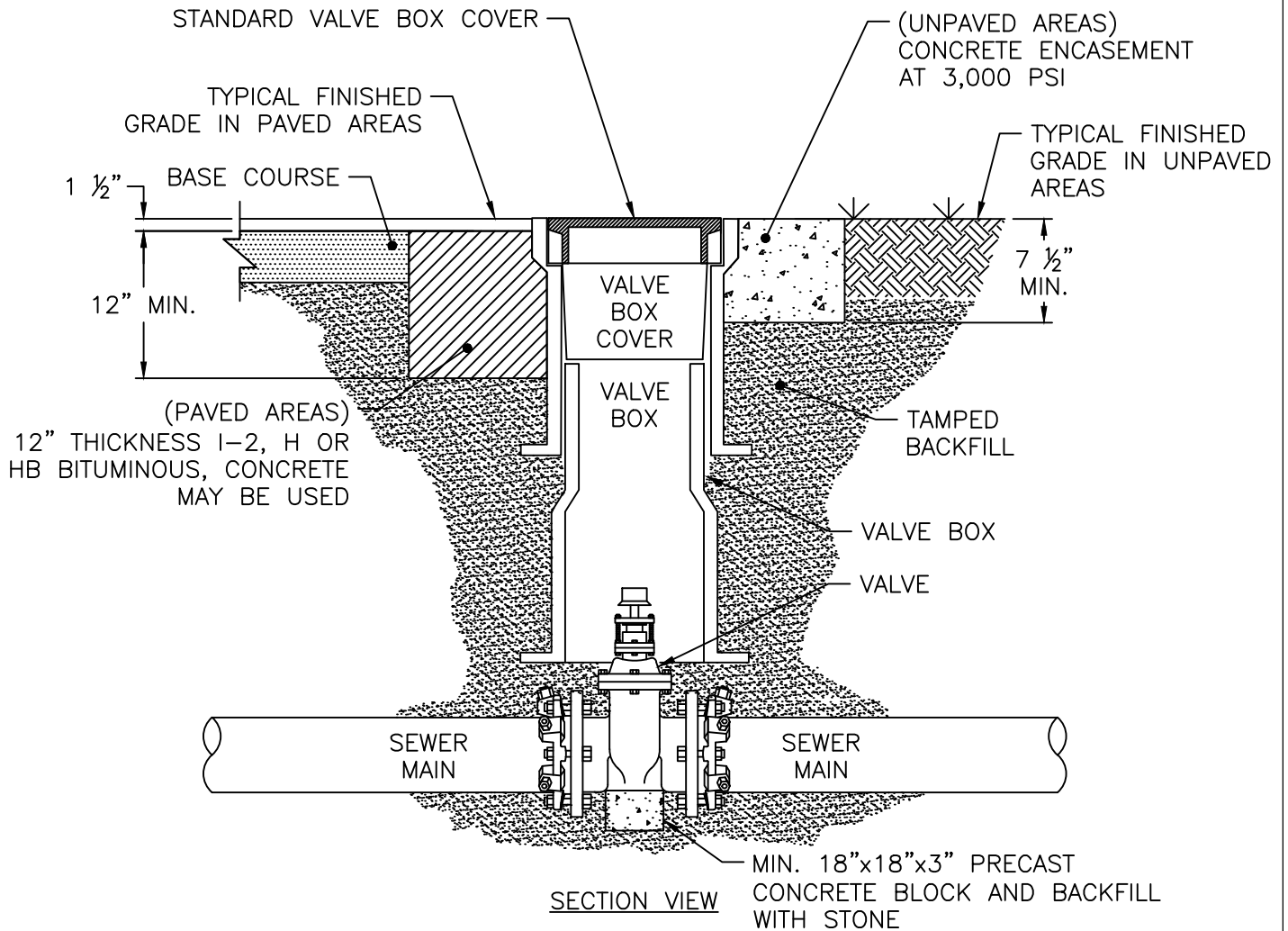
CHAIN LINK FENCE

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TRUSS ROD WITH
TRUSS TIGHTENER



PLAN VIEW



SECTION VIEW

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 5' FROM THE SURFACE USING A MANUFACTURER APPROVED EXTENSION KIT.
3. PRECAST CONCRETE ENCASEMENT IS ALLOWED OUTSIDE OF PAVED AREAS.
4. VALVE BOX SHOULD NOT CONTACT MAIN OR VALVE.

CITY OF RALEIGH
STANDARD DETAIL

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SEWER VALVE AND BOX
INSTALLATION

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