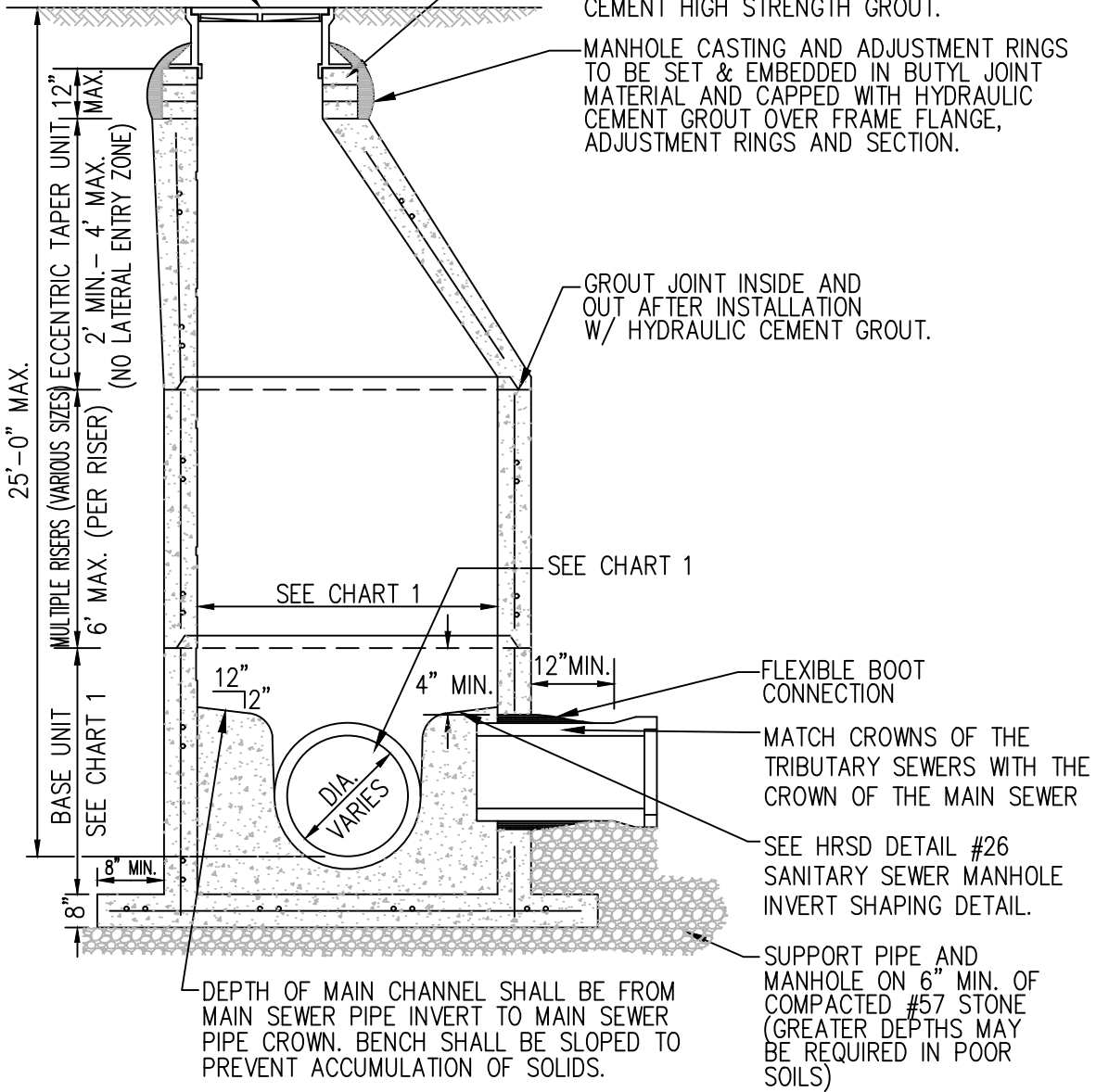


SEE HRSD SANITARY SEWER MANHOLE FRAME AND COVER DETAIL. FRAME AND COVER DETAIL TO BE SPECIFIED BY THE HRSD ENGINEER

PRECAST CONCRETE ADJUSTMENT RING (TYP). RINGS TO BE COATED AND SEALED SMOOTH ON ALL INSIDE SURFACES, 3/8" THICK (MIN.) WITH HYDRAULIC CEMENT HIGH STRENGTH GROUT.

MANHOLE CASTING AND ADJUSTMENT RINGS TO BE SET & EMBEDDED IN BUTYL JOINT MATERIAL AND CAPPED WITH HYDRAULIC CEMENT GROUT OVER FRAME FLANGE, ADJUSTMENT RINGS AND SECTION.

GROUT JOINT INSIDE AND OUT AFTER INSTALLATION W/ HYDRAULIC CEMENT GROUT.



SEE DRAWING #200B FOR NOTES.

NOT TO SCALE



STANDARD PRECAST CONCRETE

MANHOLE W/EXTENDED MONOLITHIC BASE

DRAWING NO.  
200A  
SHEET  
1 OF 2  
DATE  
7/2026

CHART 1

PIPE SIZE	MANHOLE DIAMETER	BASE UNIT HEIGHT	WALL THICKNESS—MIN.
< OR = 24"	48"	24"—48"	5"
27"—36"	60"	60" (MIN.)	6"
42"	72"	72" (MIN.)	7"
48"	72"	48" (MIN.)	7"

NOTES:

1. PRECAST CONCRETE MANHOLE TO BE IN COMPLIANCE WITH ASTM C-478.
2. PROVIDE A MAXIMUM OF TWO LIFT HOLES PER SECTION. PLUG LIFT HOLES WATERTIGHT WITH RUBBER PLUGS AND GROUT AFTER INSTALLATION.
3. REGARDLESS OF PIPE SIZE, INSIDE DIAMETER OF MANHOLE SHALL BE 60" (MIN.) WHEN MANHOLE DEPTH IS 12' OR GREATER. 60" DIAMETER SHALL BE CONTINUOUS UP TO CONE SECTION.
4. MAXIMUM OF FOUR LATERALS PER MANHOLE.
5. ALL MANHOLES SHALL RECEIVE CONSHIELD ADDITIVE OR APPROVED EQUAL DURING CASTING.
6. CONCRETE USED TO FORM THE BENCH SHALL RECEIVE THE CONSHIED ADDITIVE, OR APPROVED EQUAL.
7. COAT EXTERIOR OF MANHOLE IN ACCORDANCE WITH THE HRSD COATINGS MANUAL, CURRENT REVISION, COATING SYSTEM E-2-C. COATING SHALL BE FIELD APPLIED.



STANDARD PRECAST CONCRETE

MANHOLE W/EXTENDED MONOLITHIC BASE

DRAWING NO.  
200B

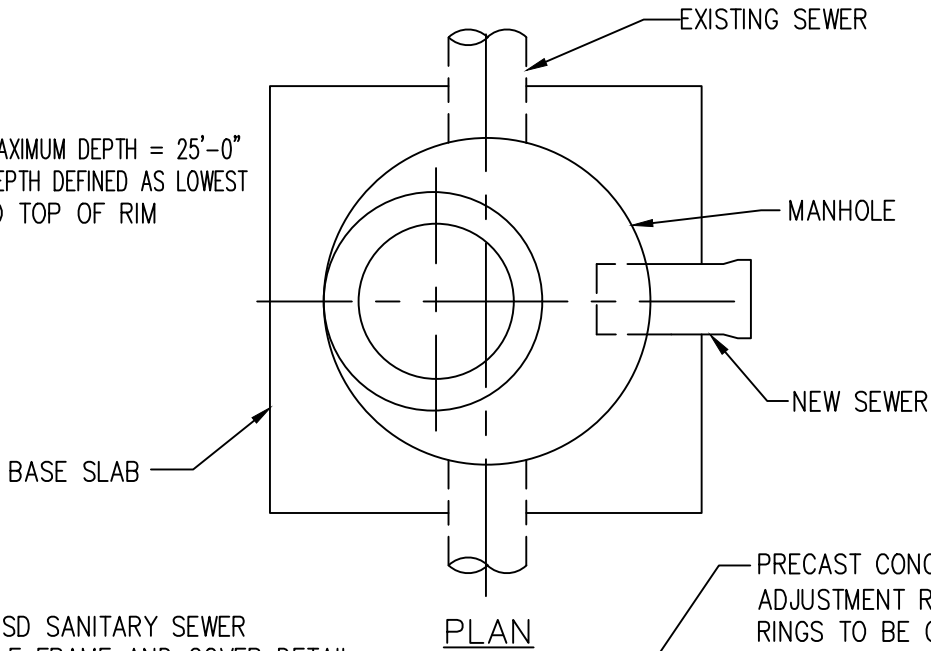
SHEET  
2 OF 2

DATE  
7/2026



**NOTE:**

MANHOLE MAXIMUM DEPTH = 25'-0"  
 MANHOLE DEPTH DEFINED AS LOWEST  
 INVERT TO TOP OF RIM



SEE HRSD SANITARY SEWER  
 MANHOLE FRAME AND COVER DETAIL.  
 FRAME AND COVER TYPE TO BE  
 SPECIFIED BY HRSD ENGINEER.

PRECAST CONCRETE  
 ADJUSTMENT RING (TYP).  
 RINGS TO BE COATED AND SEALED  
 SMOOTH ON ALL INSIDE SURFACES,  
 3/8" THICK (MIN.) WITH HYDRAULIC  
 CEMENT HIGH STRENGTH GROUT.

FINISHED GRADE

12" MAX.

DOGHOUSE TYPE OPENING  
 RADIUS=1/2 PIPE O.D. + 2"  
 TOTAL HEIGHT=PIPE O.D. + 4"

CONSTRUCT CONCRETE CHANNEL  
 AND BENCH IN FIELD, SEE SANITARY  
 MANHOLE INVERT SHAPING  
 DETAIL #204

4" MIN. EMBEDMENT

FIELD POUR BASE SLAB  
 UNDER EXISTING SEWER.  
 REINFORCE W/ #5 REBAR @  
 12" O.C. EACH WAY. ALL  
 REBAR TO HAVE 1-1/2"  
 MIN. COVER. CONCRETE TO  
 BE CLASS A-3.

12"

DEPTH OF MAIN CHANNEL SHALL BE FROM  
 EXISTING SEWER PIPE INVERT TO EXISTING  
 SEWER PIPE CROWN. BENCH SHALL BE SLOPED  
 TO PREVENT ACCUMULATION OF SOLIDS.

MANHOLE CASTING AND ADJUSTMENT  
 RINGS TO BE SET & EMBEDDED IN BUTYL  
 JOINT MATERIAL AND CAPPED WITH  
 HYDRAULIC CEMENT GROUT OVER FRAME  
 FLANGE, ADJUSTMENT RINGS AND SECTION

GROUT JOINT INSIDE AND OUT AFTER  
 INSTALLATION W/ HYDRAULIC CEMENT  
 GROUT

PRECAST CONCRETE  
 MANHOLE SECTIONS

MATCH CROWN OF NEW SEWER  
 WITH CROWN OF EXISTING SEWER

12" MIN.

FLEXIBLE BOOT  
 CONNECTION

APPLY WATERSTOP  
 GROUTING BETWEEN  
 MANHOLE WALL AND PIPE

SUPPORT PIPE AND MANHOLE  
 ON 6" MIN. OF COMPACTED  
 #57 STONE (GREATER DEPTHS  
 MAY BE REQUIRED IN POOR  
 SOILS)

8" MIN.

SEE CHART 1

12"  
 2"1"

SEE DETAIL #202B, SHEET 2 OF 2 FOR NOTES.

NOT TO SCALE



STANDARD DESIGN DETAIL

SANITARY SEWER STRADDLE MANHOLE

DRAWING NO.  
 202A

SHEET  
 1 OF 2

DATE  
 7/2026

CHART 1

PIPE SIZE	MANHOLE DIAMETER	BASE UNIT HEIGHT	WALL THICKNESS—MIN.
< OR = 24"	48"	24"—48"	5"
27"—36"	60"	60" (MIN.)	6"
42"	72"	72" (MIN.)	7"
48"	72"	48" (MIN.)	7"

NOTES:

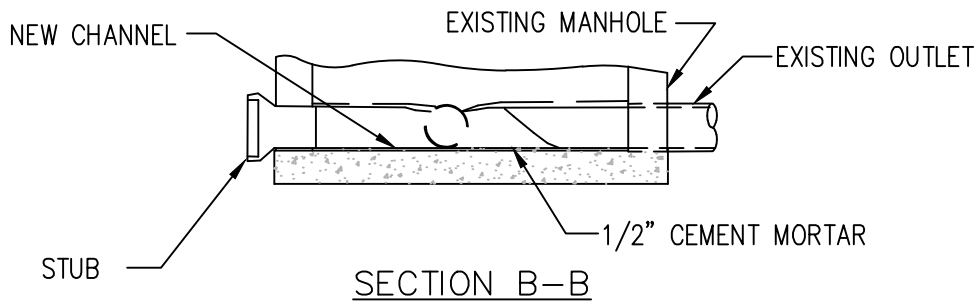
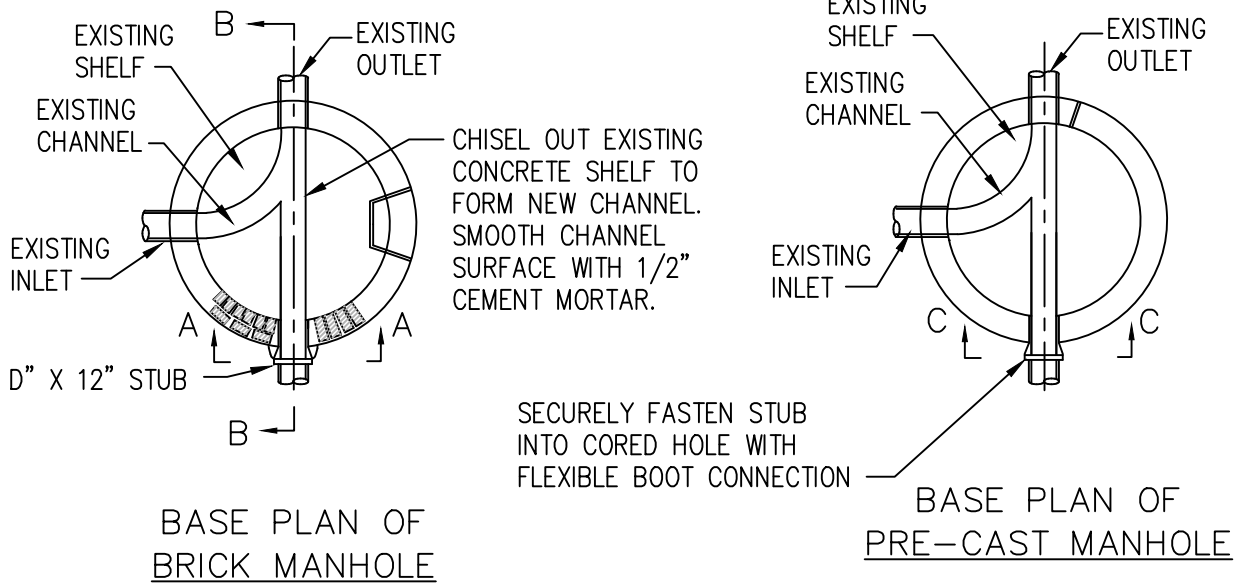
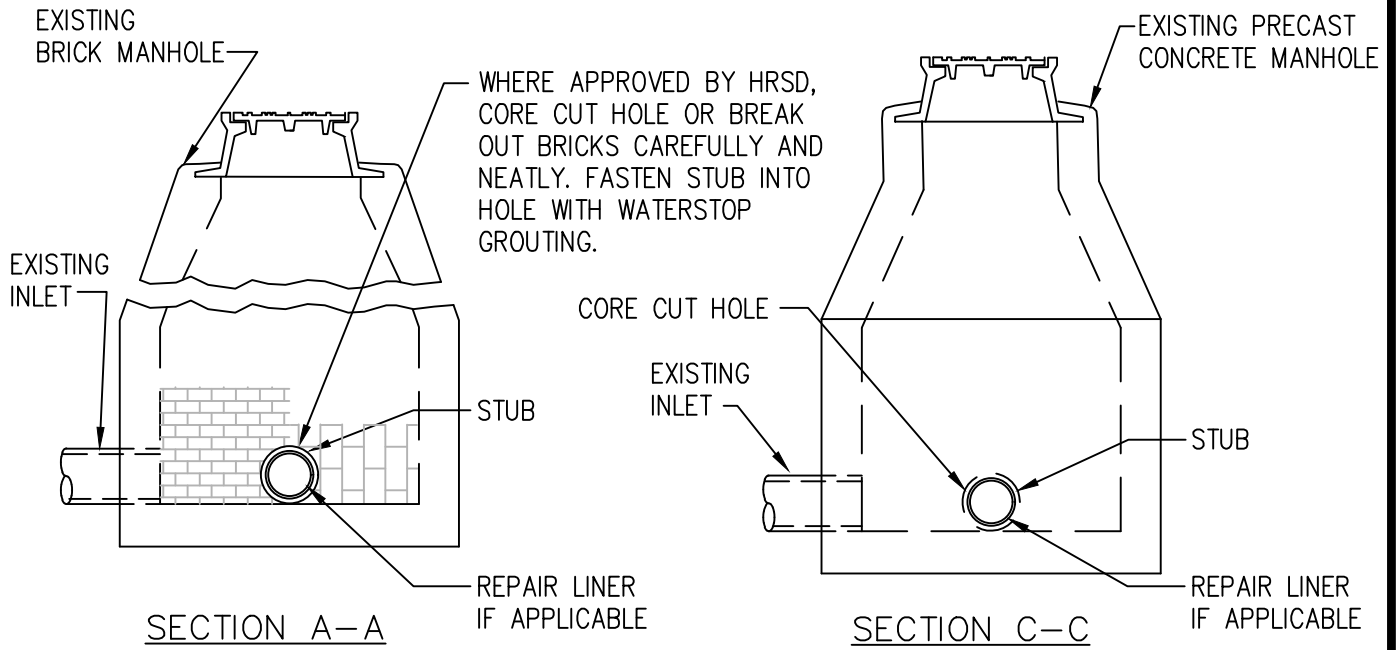
1. PRECAST CONCRETE MANHOLE TO BE IN COMPLIANCE WITH ASTM C-478.
2. PROVIDE A MAXIMUM OF TWO LIFT HOLES PER SECTION. PLUG LIFT HOLES WATERTIGHT WITH RUBBER PLUGS AND GROUT AFTER INSTALLATION.
3. REGARDLESS OF PIPE SIZE, INSIDE DIAMETER OF MANHOLE SHALL BE 60" (MIN.) WHEN MANHOLE DEPTH IS 12' OR GREATER. 60" DIAMETER SHALL BE CONTINUOUS UP TO CONE SECTION.
4. MAXIMUM OF FOUR LATERALS PER MANHOLE.
5. ALL MANHOLES SHALL RECEIVE CONSHIELD ADDITIVE OR APPROVED EQUAL DURING CASTING.
6. COAT EXTERIOR OF MANHOLE IN ACCORDANCE WITH HRSD COATINGS MANUAL, CURRENT REVISION, COATING SYSTEM E-2-C. COATING SHALL BE FIELD APPLIED.
7. CONCRETE USED TO FORM THE BENCH SHALL RECEIVE THE CONSHIELD ADDITIVE, OR APPROVED EQUAL.



STANDARD DESIGN DETAIL

SANITARY SEWER STRADDLE MANHOLE

DRAWING NO. 202B
SHEET 2 OF 2
DATE 7/2026



NOTES:  
MATCH CROWN OF NEW PIPE STUB TO EXISTING PIPE CROWNS.

NOT TO SCALE



STANDARD DESIGN DETAIL

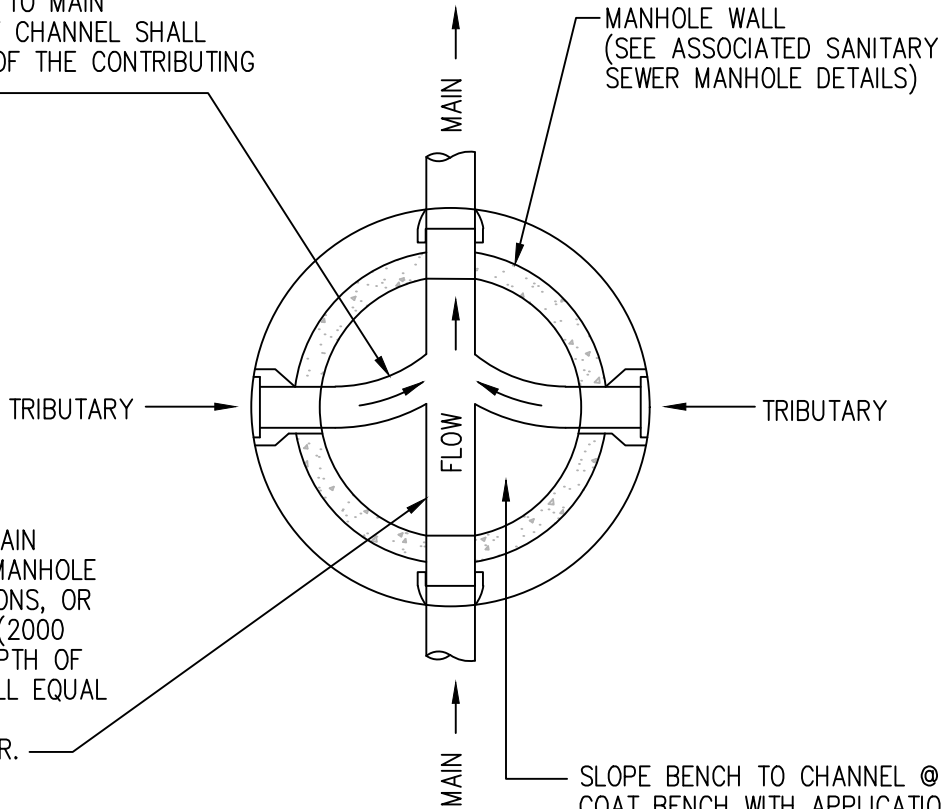
CONNECTION INTO EXISTING MANHOLES

DRAWING NO.  
203

SHEET  
1 OF 1

DATE  
7/2026

FORM TRIBUTARY CHANNELS OF CONCRETE (2000 P.S.I.) (TROWEL FINISH) ON A CONTINUOUS CURVE TO MAIN CHANNEL. DEPTH OF CHANNEL SHALL EQUAL THE DEPTH OF THE CONTRIBUTING SEWER.



INVERT OF SEWER MAIN CARRIED THROUGH MANHOLE W/SPLIT PIPE SECTIONS, OR FORMED CONCRETE (2000 P.S.I.) CHANNEL. DEPTH OF MAIN CHANNEL SHALL EQUAL THE DEPTH OF THE CONTRIBUTING SEWER.

SLOPE BENCH TO CHANNEL @ 2":12". COAT BENCH WITH APPLICATION OF AN APPROVED COATING, IF SPECIFIED.

NOTES:

1. SPLIT PIPE ONLY ALLOWED IN STRADDLE MANHOLES.
2. CONCRETE USED TO FORM THE BENCH SHALL RECEIVE THE CONSHIELD ADDITIVE, OR APPROVED EQUAL.
3. BENCH SHALL BE FORMED TO ACCOMMODATE CCTV EQUIPMENT.

NOT TO SCALE



STANDARD DESIGN DETAIL

SEWER MANHOLE FLOW CHANNEL

DRAWING NO. 204
SHEET 1 OF 1
DATE 7/2026

INSIDE DROP  
BOWL  
(RELINER INC.)  
OR APPROVED  
EQUAL

TRACE WIRE SHALL TERMINATE AT  
MANHOLE WALL AT A MAX DISTANCE OF  
24" BELOW MANHOLE FRAME AND  
COVER. TRACER WIRE SHALL BE  
ATTACHED TO MANHOLE WALL WITH 316  
STAINLESS STEEL CLAMP AND BOLT

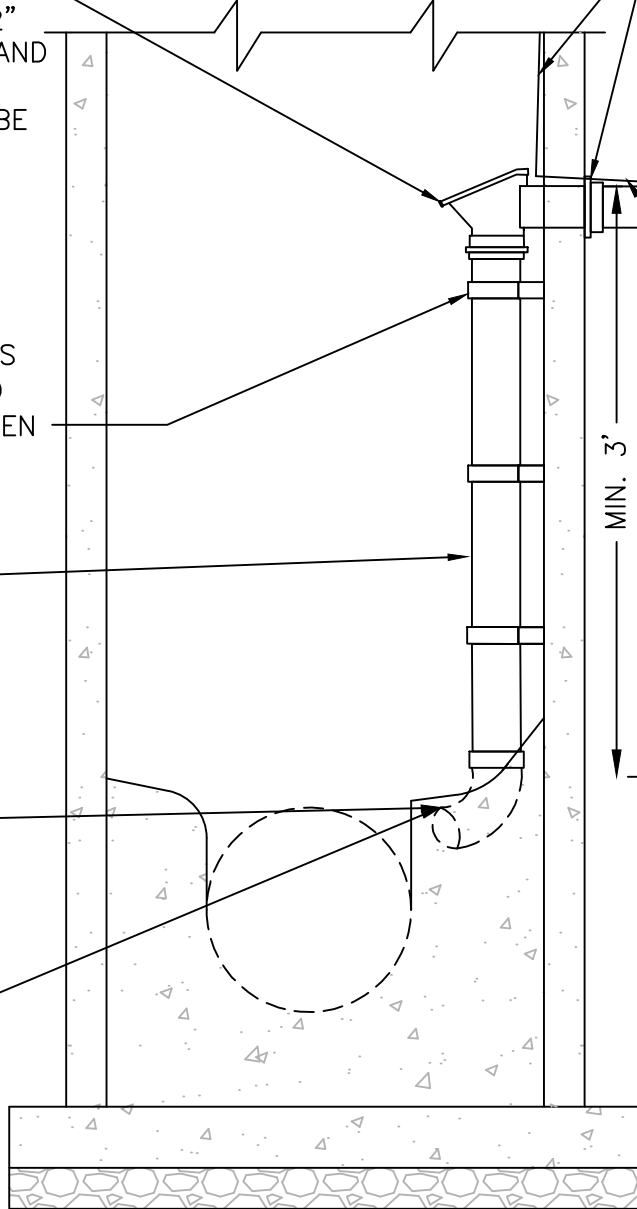
SEE HRSD DETAIL #203,  
CONNECTION INTO  
EXISTING MANHOLE

STRAP - 3/8" X 1-1/2"  
FLAT BAR FABRICATED AND  
INSTALLED TO SUPPORT  
PIPE (MATERIAL SHALL BE  
316 STAINLESS STEEL)  
ATTACHED TO MANHOLE  
WITH (2) 3/8"  
316 STAINLESS STEEL  
ANCHOR BOLTS, MIN 3"  
EMBEDMENT. PROVIDE A  
MINIMUM OF TWO STRAPS  
(TOP AND BOTTOM) AND  
ONE EVERY 4' IN BETWEEN

DROP PIPE MATERIAL  
TO MATCH INCOMING  
PIPE MATERIAL

90° BEND RESTING ON  
RE-FORMED CHANNEL &  
TURNED IN DIRECTION  
OF EXIST. SEWER FLOW.  
SEE HRSD INVERT  
SHAPING DETAIL.

MATCH CROWNS OF  
THE TRIBUTARY  
SEWERS WITH THE  
CROWN OF THE MAIN  
SEWER



MIN. 3'

GRAVITY LINE

TRACER WIRE AWG-10  
SOLID COPPER WIRE  
W/POLYETHYLENE  
INSULATION. SHALL  
BE TAPED AT A  
MAXIMUM INTERVAL  
OF 4'.  
MAX 4"Ø: GRAVITY  
MAIN PIPE  
MATERIAL SHALL BE  
PVC C-900 OR  
SDR26

NOTES:

1) THIS CONNECTION WILL ONLY BE CONSIDERED FOR  
MANHOLES GREATER THAN 6' IN DEPTH FROM RIM  
TO INVERT AND WILL ONLY BE APPROVED ON A  
CASE BY CASE BASIS BY HRSD OPERATIONS.

3) IF LATERAL CONNECTION IS  
GREATER THAN 6' IN DEPTH FROM  
GRADE. MARKING TAPE SHALL BE  
INSTALLED 3' BELOW GRADE.

2) NO LATERAL ENTRY SHALL BE ALLOWED WITHIN  
THE TAPER UNIT OF THE MANHOLE.

NOT TO SCALE

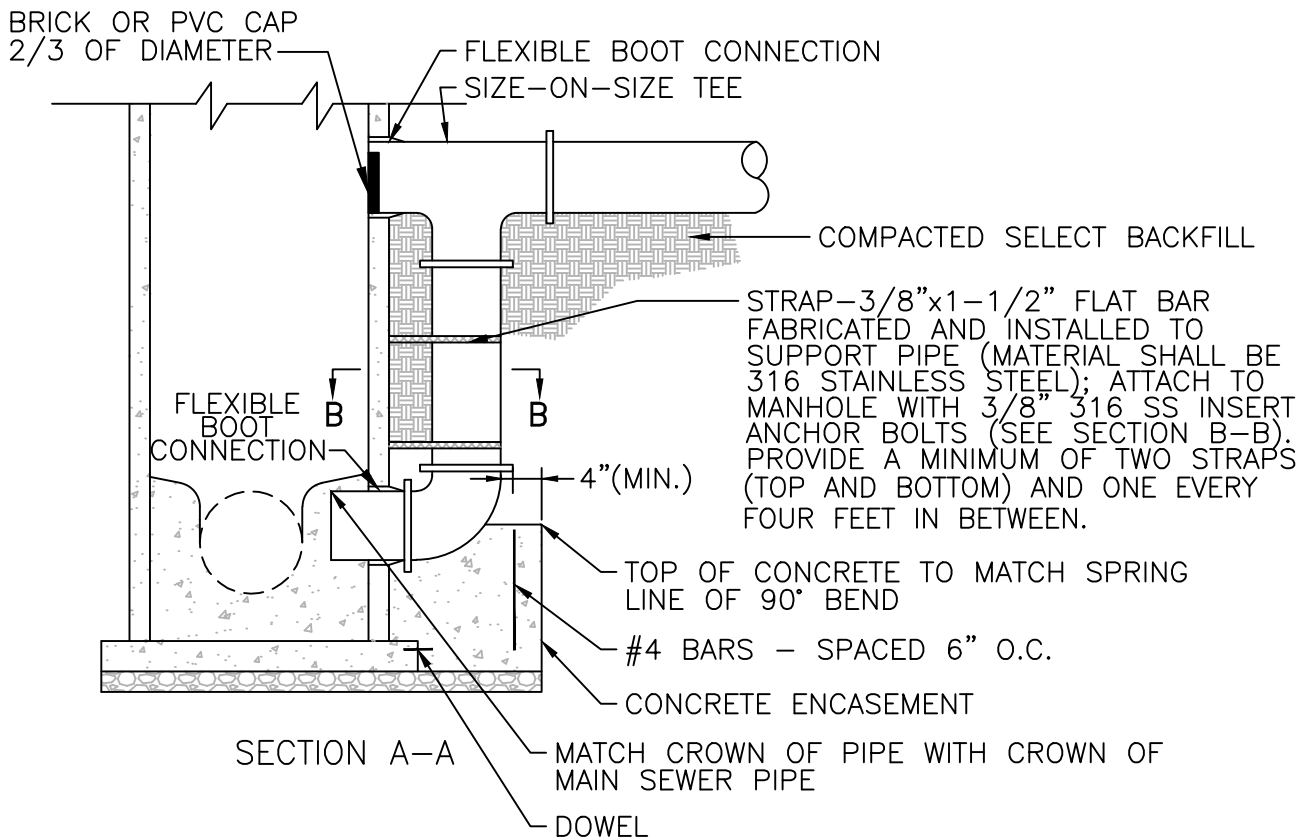
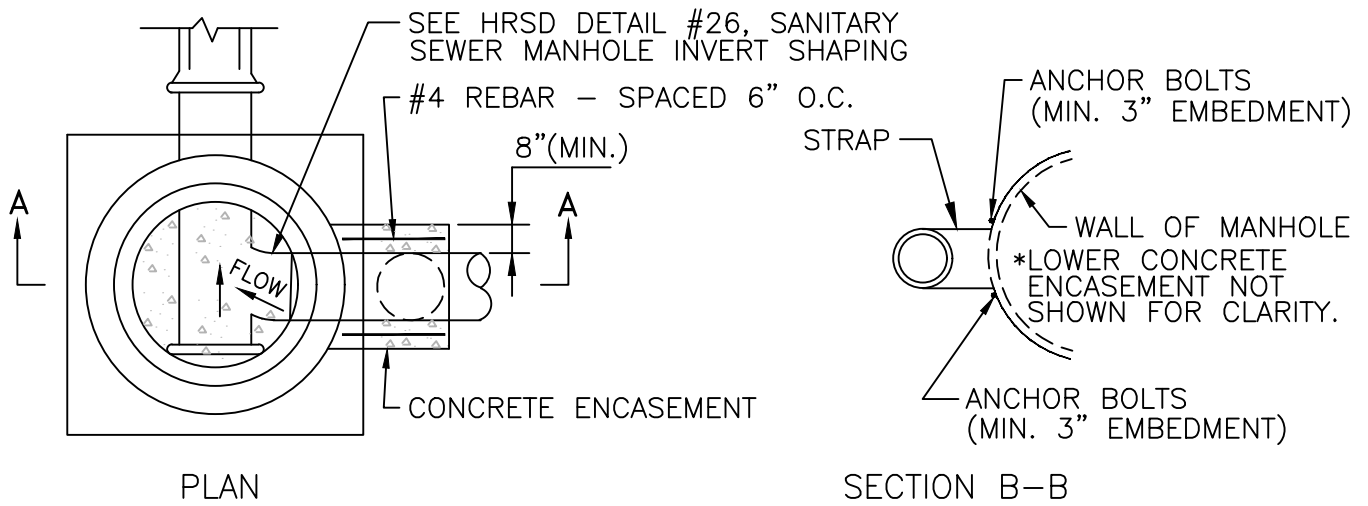


STANDARD DESIGN DETAIL  
INTERIOR GRAVITY MAIN DROP  
CONNECTION TO EXISTING MANHOLE

DRAWING NO.  
205

SHEET  
1 OF 1

DATE  
7/2026



NOT TO SCALE



STANDARD DESIGN DETAIL

EXTERIOR DROP CONNECTION WITH  
PRECAST CONCRETE MANHOLE

DRAWING NO.  
206

SHEET  
1 OF 1

DATE  
7/2026

TRACE WIRE SHALL TERMINATE AT MANHOLE WALL AT A MAX DISTANCE OF 24" BELOW MANHOLE FRAME AND COVER. TRACER WIRE SHALL BE ATTACHED TO MANHOLE WALL WITH 316 STAINLESS STEEL CLAMP AND BOLT

SEE HRSD DETAIL #203, CONNECTION INTO EXISTING MANHOLE

TRACER WIRE AWG-10 SOLID COPPER WIRE W/POLYETHYLENE INSULATION. SHALL BE TAPED AT A MAXIMUM INTERVAL OF 4'.

MAX 4"Ø: FORCE MAIN PIPE MATERIAL SHALL BE HDPE MINIMUM DR-26

MIN. 3'

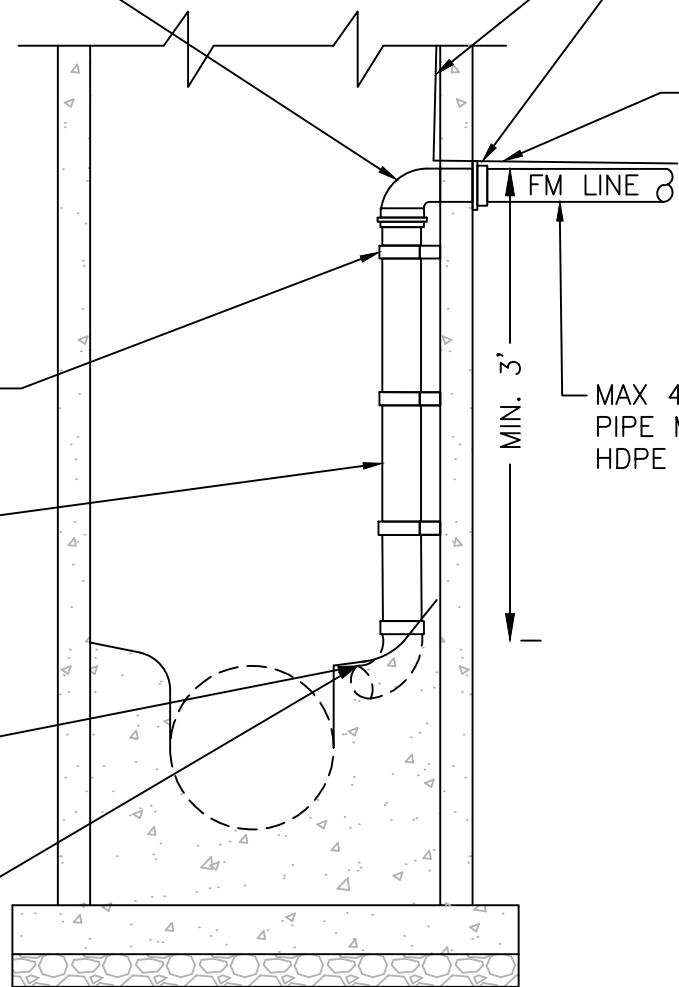
LONG RADIUS 90° BEND

STRAP - 3/8" X 1-1/2" FLAT BAR FABRICATED AND INSTALLED TO SUPPORT PIPE (MATERIAL SHALL BE 316 STAINLESS STEEL) ATTACHED TO MANHOLE WITH (2) 3/8" 316 STAINLESS STEEL ANCHOR BOLTS, MIN 3" EMBEDMENT. PROVIDE A MINIMUM OF TWO STRAPS (TOP AND BOTTOM) AND ONE EVERY 4' IN BETWEEN

DROP PIPE MATERIAL TO MATCH INCOMING FORCE MAIN MATERIAL

90° BEND RESTING ON RE-FORMED CHANNEL & TURNED IN DIRECTION OF EXIST. SEWER FLOW. SEE HRSD INVERT SHAPING DETAIL.

MATCH CROWNS OF THE TRIBUTARY SEWERS WITH THE CROWN OF THE MAIN SEWER



NOTES:

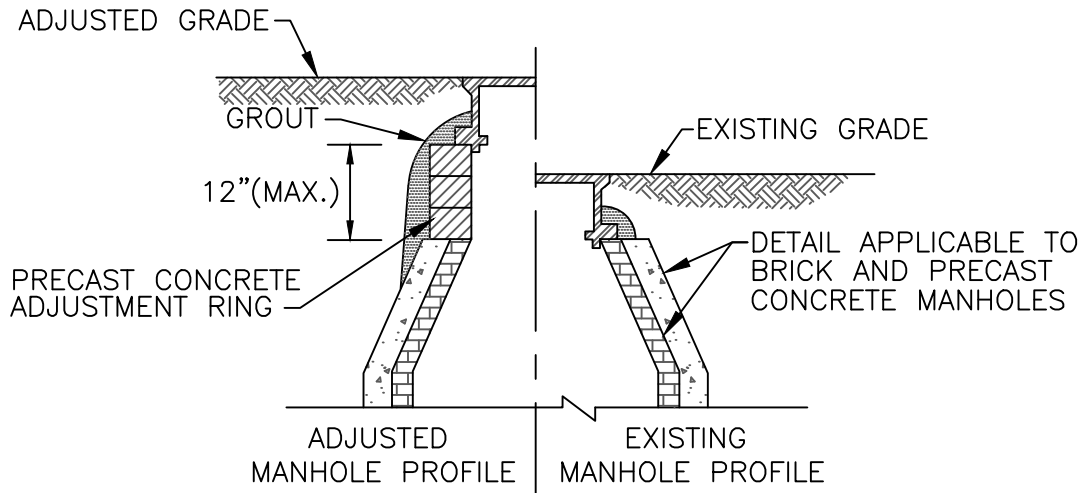
- 1) THIS CONNECTION WILL ONLY BE CONSIDERED FOR MANHOLES GREATER THAN 6' IN DEPTH FROM RIM TO INVERT AND WILL ONLY BE APPROVED ON A CASE BY CASE BASIS BY HRSD OPERATIONS.
- 2) NO FORCE MAIN ENTRY SHALL BE ALLOWED WITHIN THE TAPER UNIT OF THE MANHOLE.
- 3) REFERENCE HRPDC SAXOPHONE CONNECTION DETAIL
- 4) ALL BURIED PIPING SHALL BE HDPE DR-17, IF FUSION IS REQUIRED IT SHALL BE BUTT FUSION WELDED
- 5) IF LATERAL CONNECTION IS GREATER THAN 6' IN DEPTH FROM GRADE. MARKING TAPE SHALL BE INSTALLED 3' BELOW GRADE.

NOT TO SCALE



STANDARD DESIGN DETAIL  
 INTERIOR FORCE MAIN DROP  
 CONNECTION TO EXISTING MANHOLE

DRAWING NO.  
207  
 SHEET  
1 OF 1  
 DATE  
7/2026



**NOTES:**

1. PRECAST CONCRETE ADJUSTMENT RINGS SHALL BE USED TO RAISE THE MANHOLE FRAME FROM THE CONE SECTION. JACK UP RINGS BETWEEN THE FRAME AND COVER ARE NOT ACCEPTABLE.
2. GROUT MIX SHALL BE 1:3 CEMENT:SAND MORTAR. CAP EXTERIOR WITH GROUT OVER FRAME FLANGE, ADJUSTMENT RING(S), AND THE TOP 18" OF THE CONE SECTION. COAT INSIDE SURFACE OF THE ADJUSTMENT RINGS AND SEAL SMOOTH WITH 3/8" THICK GROUT.
3. IN LIEU OF PRECAST CONCRETE, ADJUSTMENT RINGS MAY BE COURSES OF HARD, SOUND, COMMON BRICK LAID RADIALLY AND FULLY SUPPORTING THE FRAME FLANGE. BRICK SHALL BE LAID WITH 1:3 CEMENT:SAND MORTAR WITH SHAVED JOINTS NOT TO EXCEED 3/8" THICKNESS. CAP WITH GROUT OVER FRAME FLANGE, ADJUSTMENT RING(S), AND THE TOP 18" OF THE CONE SECTION (AS SHOWN ABOVE).
4. TOTAL HEIGHT BETWEEN THE TOP OF THE CONE AND THE BOTTOM OF THE FRAME FLANGE SHALL NOT EXCEED 12" (OR 3 OF COURSES OF BRICK) AFTER THE ADJUSTMENT. IF, ON A PRECAST MANHOLE, THE TOTAL HEIGHT IS >12" BEFORE THE ADJUSTMENT, OR IF RAISING THE TOTAL HEIGHT TO 12" PROVIDES INSUFFICIENT ADJUSTMENT, INSERT AN ADDITIONAL PRECAST CONCRETE STANDARD MANHOLE SECTION BETWEEN THE CONE SECTION AND THE UPPER MOST BARREL SECTION. THE NEW SECTION SHALL HAVE RECEIVED THE CONSHIELD ADDITIVE DURING CASTING. IF, ON A BRICK MANHOLE, THE TOTAL HEIGHT IS >12" BEFORE THE ADJUSTMENT, OR IF RAISING THE TOTAL HEIGHT TO 12" PROVIDES INSUFFICIENT ADJUSTMENT, CONTACT THE HRSD ENGINEER FOR DIRECTION.
5. THE EXISTING BARREL SECTION(S), FOUNDATION, FOOT PAD, AND MANHOLE PIPES SHALL NOT BE DISTURBED.
6. MANHOLES TO BE LOWERED MAY BE LOWERED BY REMOVING EXISTING ADJUSTMENT RINGS. IF ADJUSTMENT RINGS ARE NOT PRESENT BETWEEN THE FRAME AND THE CONE SECTION, OR IF THEIR REMOVAL PROVIDES INSUFFICIENT ADJUSTMENT, CONTACT THE HRSD ENGINEER.

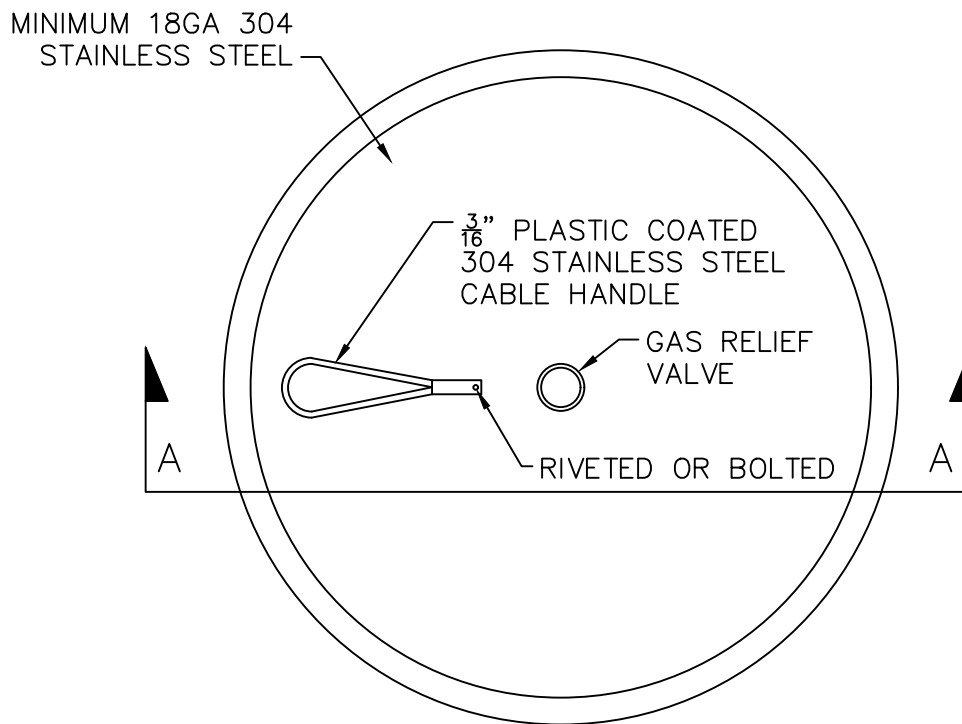
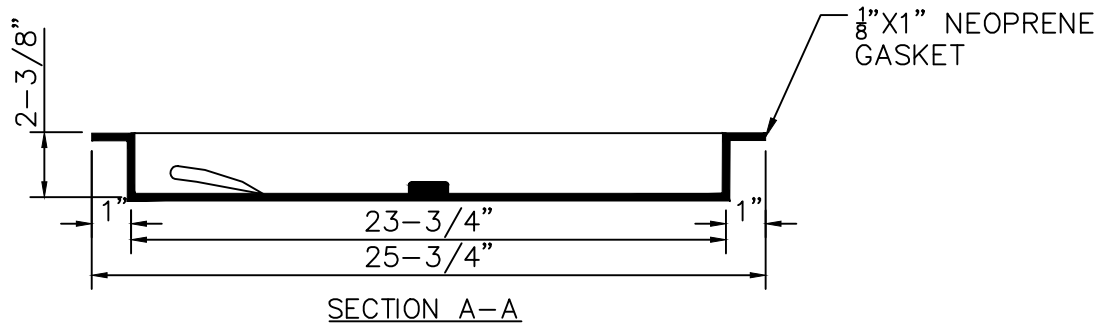
NOT TO SCALE



STANDARD PRECAST CONCRETE

PRECAST CONCRETE MANHOLE ADJUSTMENT

DRAWING NO. 208
SHEET 1 OF 1
DATE 7/2026



**NOTES:**

1. ACTUAL DIMENSIONS MUST BE COMPATIBLE WITH MANHOLE CASTING DIMENSIONS.
2. DUST COVER NOT REQUIRED WHEN USING MANHOLE INSERT.
3. GAS RELIEF VALVE SHALL BE CAPABLE OF RELEASING GAS AT A PRESSURE OF 0.5 TO 1.5 PSI AND HAVE A WATER LEAK DOWN RATE NO GREATER THAN 5 GALLONS/24 HOURS.
4. LOAD TEST STRENGTH MUST EXCEED 3,000 POUNDS.
5. HANDLE MUST BE CAPABLE OF WITHSTANDING A MINIMUM 500 POUND PULL FORCE.

NOT TO SCALE



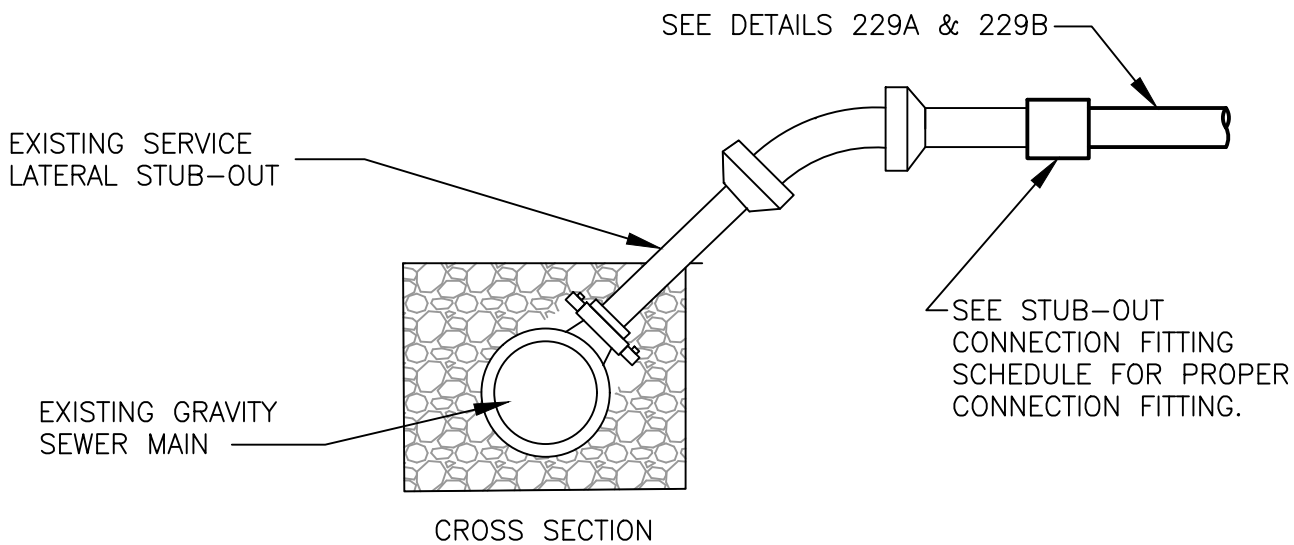
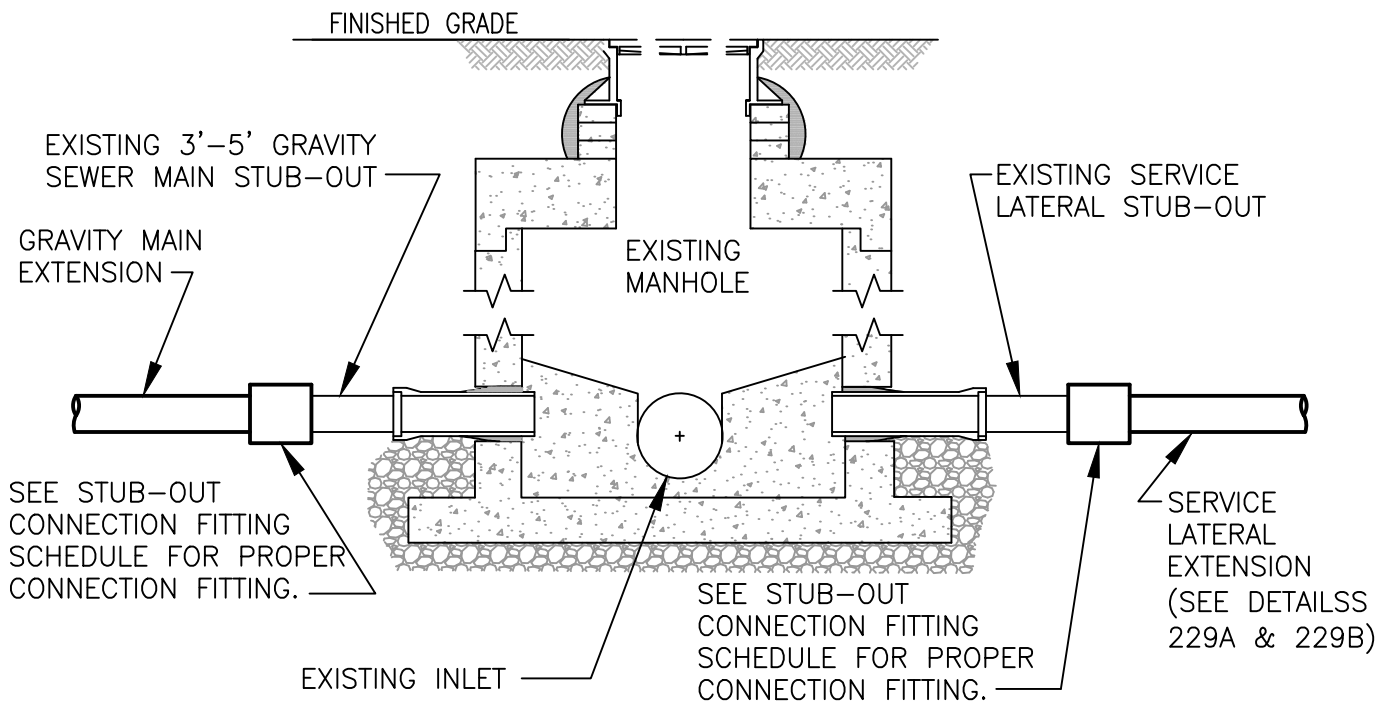
STANDARD DESIGN DETAIL

MANHOLE INSERT

DRAWING NO.  
209

SHEET  
1 OF 1

DATE  
7/2026



STUB-OUT CONNECTION FITTING SCHEDULE	
STUB-OUT MATERIAL	FITTING
PVC	PVC COUPLING
DI/CI	JCM 201
VITRIFIED CLAY	FERNCO 102 SERIES

NOTE:  
 1. CONTRACTOR SHALL FIELD VERIFY ALL PIPE MATERIAL AND SIZES PRIOR TO PROCURING MATERIAL

NOT TO SCALE

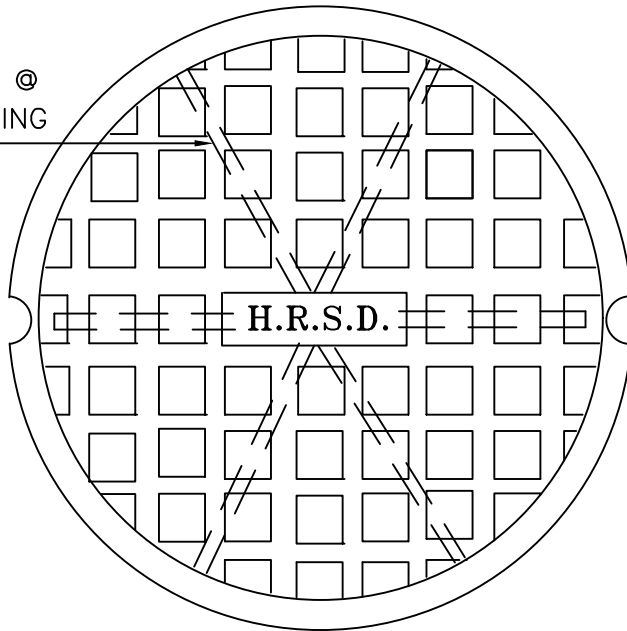


STANDARD DESIGN DETAIL

SERVICE LATERAL & GRAVITY MAIN CONNECTION TO EXISTING STUB-OUT

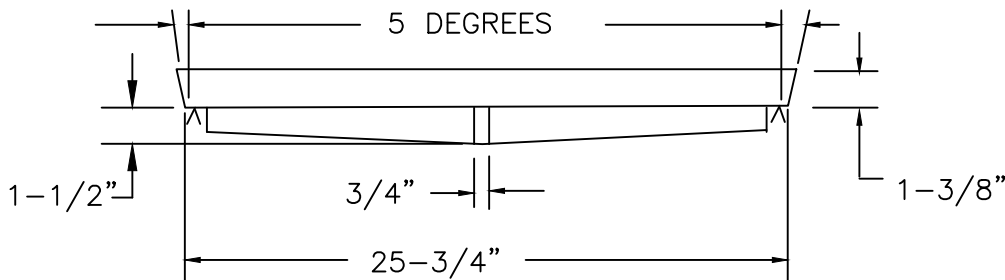
DRAWING NO.  
226  
 SHEET  
1 OF 1  
 DATE  
7/2026

6 WEBS @  
60° SPACING

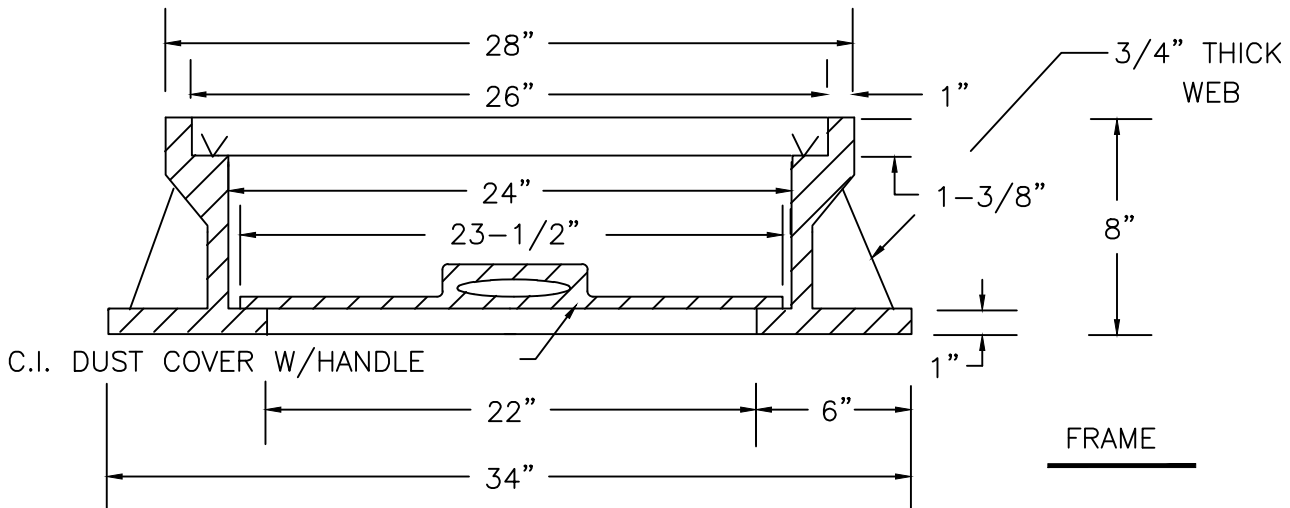


**NOTES:**

1. CASTINGS TO BE SHOT BLASTED
2. CASTING TO BE ASTM A-48 CLASS 30
3. TOLERANCE  $\pm .125"$
4. MACHINE SEATING SURFACE ON BOTH FRAME & COVER
5. 0.375" MIN. THICKNESS OF DUST COVER
6. MINIMUM WEIGHTS:  
COVER-165 LBS.  
FRAME-303 LBS.
7. SEE MASTER SPEC SECTION 01340 FOR AMERICAN IRON AND STEEL REQUIREMENT.



COVER



FRAME

\* USE WHERE 24" WATERTIGHT M.H. MAY NOT BE APPLICABLE.

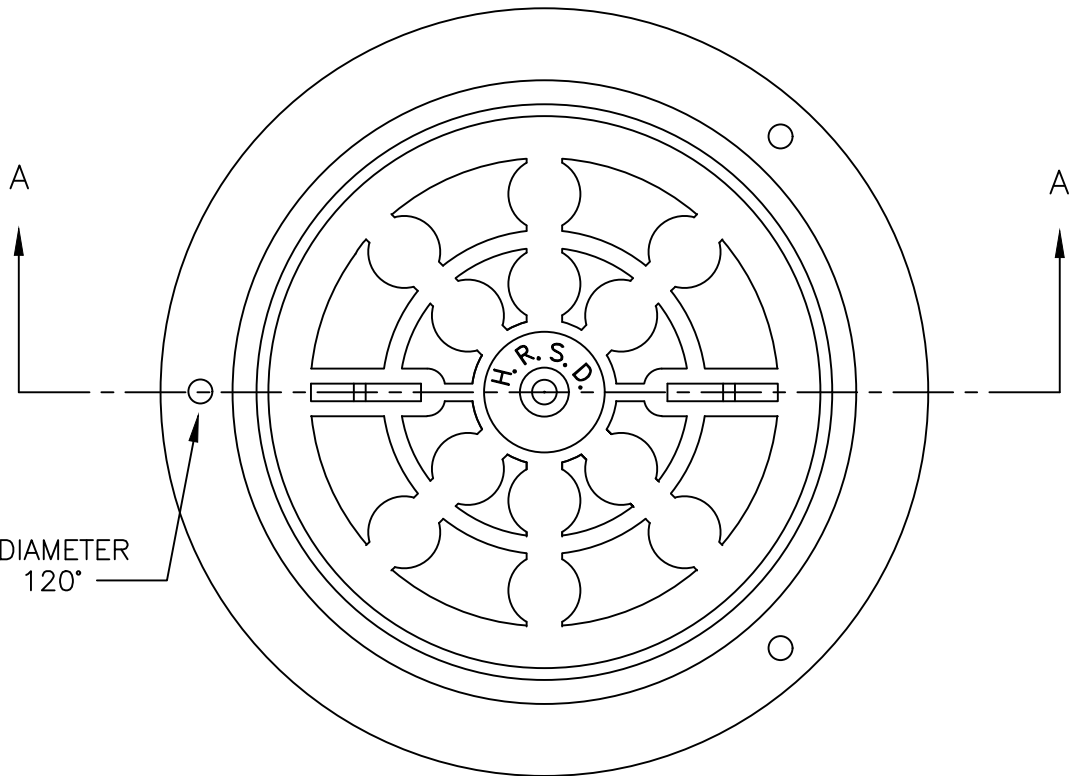
NOT TO SCALE



STANDARD DESIGN DETAIL

STANDARD MANHOLE FRAME AND COVER

DRAWING NO. 227
SHEET 1 OF 1
DATE 7/2026

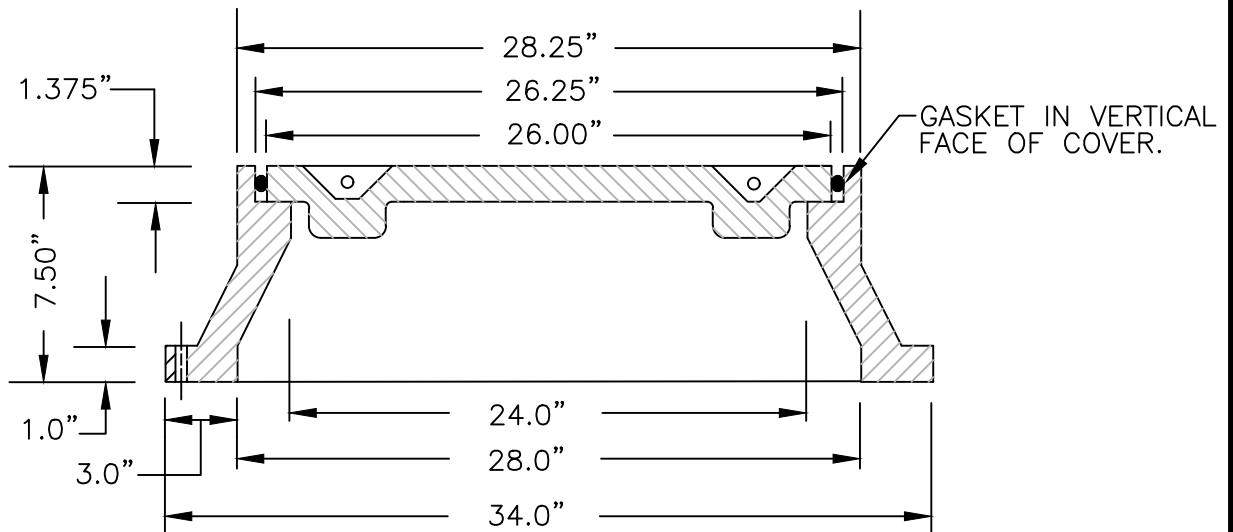


3 - 1" DIAMETER  
HOLES @ 120°

PLAN

NOTES

1. CASTINGS TO BE SHOT BLASTED.
2. CASTINGS SHALL MEET OR EXCEED ASTM A-48-76 CLASS 30-B.
3. TOLERANCE  $\pm 0.125"$ .
4. MACHINE SEATING SURFACE ON BOTH FRAME & COVER.
5. FRAME & COVER TO BE DEWEY BROS. INC. MH-RCR-3000W (WATERTIGHT) OR EQUAL.
6. MINIMUM WEIGHTS:  
COVER-170 LBS.  
FRAME-262 LBS.
7. SEE MASTER SPEC SECTION 01340 FOR AMERICAN IRON AND STEEL REQUIREMENT.



SECTION A-A

NOT TO SCALE



STANDARD DESIGN DETAIL

WATERTIGHT MANHOLE FRAME AND COVER

DRAWING NO.  
228

SHEET  
1 OF 1

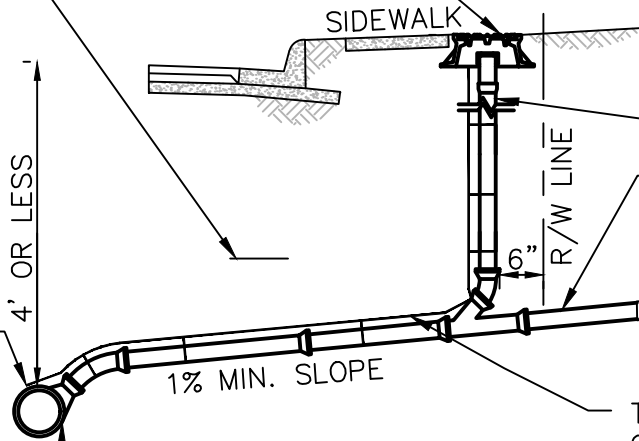
DATE  
7/2026

DETECTABLE TAPE  
(SEE NOTE 5)

SEE STANDARD  
DETAIL #251, IF  
APPLICABLE #252

INSTALL HEAT  
SHRINK TUBING.  
TUBING SHALL  
OVERLAP END OF  
TRACER WIRE A  
MIN. OF 3" OF  
POLYETHYLENE  
INSULATION

SEE HRSD DETAIL  
FOR CONNECTION  
TO NEW OR  
EXISTING MAIN



SHALLOW DETAIL

TO BE USED WHEN MAIN LINE  
DEPTH IS LESS THAN OR  
EQUAL TO 4'

SINGLE PIPE NO JOINTS

PRIMARY CONNECTION  
POINT. A MIN. OF 3' OF  
STRAIGHT PIPE SHALL BE  
INSTALLED WITH  
PERMANENT CAP PLACED  
ON END OF STRAIGHT  
PIPE.

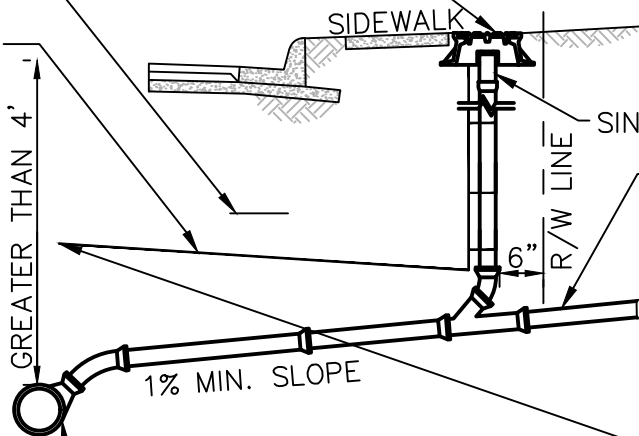
TRACER WIRE ATTACHED TO  
CENTERLINE OF PIPE WITH  
PLASTIC STRAPS (TYP)

DETECTABLE TAPE  
(SEE NOTE 5)

SEE STANDARD  
DETAIL #251, IF  
APPLICABLE #252

TRACER WIRE BURIED  
OVER CENTERLINE OF  
PVC PIPE 3' BELOW  
GRADE

SEE HRSD DETAIL FOR  
CONNECTION TO NEW OR  
EXISTING MAIN



DEEP DETAIL

TO BE USED WHEN MAIN LINE  
DEPTH IS GREATER THAN 4'

SINGLE PIPE NO JOINTS

PRIMARY CONNECTION  
POINT. A MIN. OF 3' OF  
STRAIGHT PIPE SHALL BE  
INSTALLED WITH  
PERMANENT CAP PLACED  
ON END OF STRAIGHT  
PIPE.

INSTALL HEAT SHRINK  
TUBING. TUBING SHALL  
OVERLAP END OF  
TRACER WIRE A MIN OF  
3" OF POLYETHYLENE  
INSULATION

\*SEE SHEET 2 FOR NOTES

NOT TO SCALE



STANDARD DESIGN DETAIL

SANITARY SERVICE LATERAL INSTALLATION


DRAWING NO.  
229A

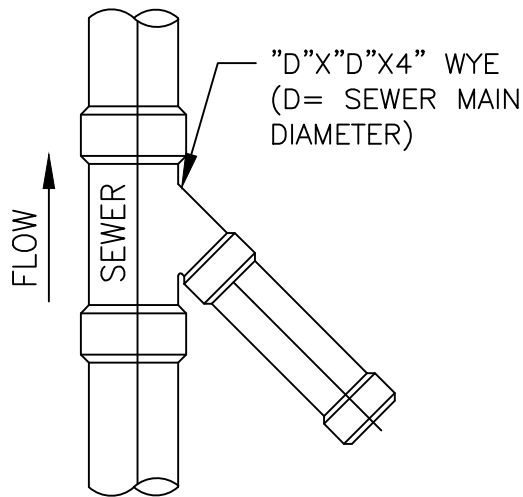
SHEET  
1 OF 2

DATE  
7/2026

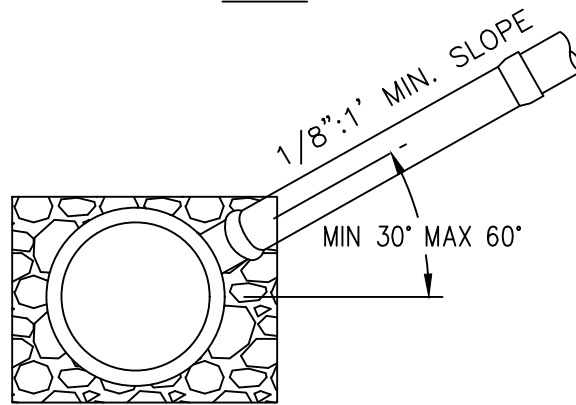
NOTES:

1. TYPICAL LATERAL LAYOUT:
  - 1.1. SHALL ONLY UTILIZE THE PRIMARY CONNECTION POINT WHEN TYING TO AN EXISTING LATERAL.
  - 1.2. THE CONNECTION POINT TO THE PRIVATE LATERAL AND TO THE SANITARY SERVICE LATERAL CLEANOUT SHALL BE MADE WITH SOLID SLEEVES.
  - 1.3. FERNCO COUPLINGS OR EQUIVALENTS ARE NOT PERMITTED ON THE LATERAL CONNECTION OR AT THE CONNECTION POINT TO THE PRIVATE LATERAL, UNLESS THE PRIVATE LATERAL IS VCP (VITRIFIED CLAY PIPE). CONNECTIONS WILL NOT BE ALLOWED IF THE PRIVATE LATERAL PIPE MATERIAL IS ORANGEBURG PIPE (BITUMINIZED FIBER SEWER PIPE).
  - 1.4. RC STRONG BACK FERNCO COUPLINGS SHALL BE ENCASED IN CONCRETE AND SHALL ONLY BE ALLOWED ON VITRIFIED CLAY PIPE (VCP). CONCRETE SHALL BE DIRT FORMED IN A 6" BOX TO ENCOMPASS THE ENTIRE FITTING.
  - 1.5. CLEANOUT RISER ASSEMBLY AND FITTING SHALL BE SAME MATERIAL AS THE SEWER LATERAL
2. CLEANOUT RISER ASSEMBLY, LATERAL CLEANOUT AND TRACER WIRE SHALL BE INSTALLED PRIOR TO FINAL INSPECTION/ACCEPTANCE. LOCATION OF WYE AND CLEANOUT MAY BE VARIED BY HRSD STAFF IF NECESSARY DUE TO UNUSUAL DEPTH OR CONDITIONS. MINIMUM COVER OF 3.0 FEET REQUIRED FOR SERVICE.
3. LATERAL MATERIAL SHALL BE POLYVINYLCHLORIDE (P.V.C.). ASTM D-3034 SDR 26, AWWA C900-CLASS 150 (DR-18) OR ASTM D-1785 SCHEDULE 40. FOR DEPTHS LESS THAN 2' OR GREATER THAN 10' CONTACT HRSD FOR PIPE MATERIAL.
4. TRACER WIRE SHALL BE AWG 10 SOLID COPPER WIRE WITH POLYETHYLENE INSULATION. THE TRACER WIRE SHALL BE ATTACHED TO THE LATERAL PIPE WHEN THE DEPTH IS NO GREATER THAN 4.0 FEET. THE WIRE SHALL BE BURIED OVER THE CENTERLINE OF THE LATERAL PIPE AT 3.0 FEET BELOW GRADE WHEN THE LATERAL DEPTH IS GREATER THAN 4.0 FEET.
5. INSTALL DETECTABLE WARNING TAPE CONTINUOUSLY FROM THE MAIN TO THE HRSD CLEANOUT 1' ABOVE TOP OF TRACER WIRE. TAPE SHALL BE GREEN IN COLOR AND STATE " CAUTION BURIED SEWER LINE BELOW"
6. CONTRACTOR SHALL UTILIZE NO MORE THAN FOUR (4) FITTINGS FROM THE HRSD CONNECTION POINT TO THE HRSD CLEANOUT.

	STANDARD DESIGN DETAIL	DRAWING NO. 229B
		SHEET 2 OF 2
	SANITARY SERVICE LATERAL INSTALLATION	DATE 7/2026



PLAN



SECTION VIEW

NOTES:

1. PROVIDE A CAPPED EXTENSION TO PROPERTY LINE PER HRSD REQUIREMENTS IF SEWER SERVICE WILL NOT BE ACTIVATED AT THE TIME OF CONSTRUCTION.
2. CLEAN OUT SHALL BE INSTALLED AT THE ROW OR HRSD EASEMENT/PROPERTY LINE, UNLESS OTHERWISE STATED.
3. CONTRACTOR SHALL USE NO MORE THAN FOUR (4) FITTINGS. BENDS SHALL HAVE A MAX ANGEL OF 60° AND A MINIMUM OF 30° ALL BENDS SHALL BE LONG RADIUS.
4. WYE CONNECTION SHALL BE PLACED BETWEEN THE 1:30-3 O'CLOCK OR 9 TO 10:30 O'CLOCK POSITION ON THE GRAVITY MAIN.
5. THIS DETAIL SHALL BE USED IN CONJUCTION WITH STANDARD DETAILS 229A & 229B AND DETAILS 251 & 252.
6. PIPING BEDDING SHALL BE TYPE IV BEDDING REFERANCE HRPDC DETAIL EW\_01.

NOT TO SCALE

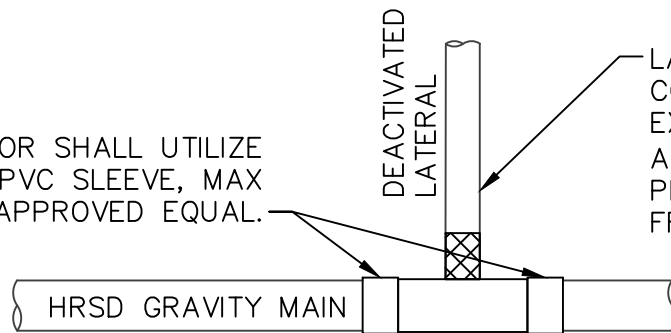


STANDARD DESIGN DETAIL

SANITARY SEWER SERVICE CONNECTION  
FOR NEW OR EXISTING GRAVITY MAIN

DRAWING NO.	230
SHEET	1 OF 1
DATE	7/2026

CONTRACTOR SHALL UTILIZE SOLID WALL PVC SLEEVE, MAX ADAPTOR OR APPROVED EQUAL.

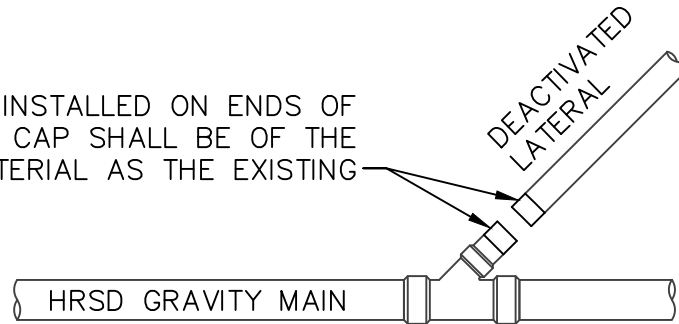


LATERAL PIPE IS TO BE COMPLETELY REMOVED FROM EXISTING HRSD GRAVITY MAIN. A MINIMUM OF 36" LATERAL PIPE IS TO BE REMOVED AWAY FROM THE MAIN.

BREAK-IN TAP DEACTIVATION

C900 PVC TO MATCH EXISTING GRAVITY MAIN SIZE

CAP SHALL BE INSTALLED ON ENDS OF CONNECTION. CAP SHALL BE OF THE SAME PIPE MATERIAL AS THE EXISTING



WYE OR TEE DEACTIVATION

NOTES:

1. DEACTIVATED LATERAL SHALL BE REMOVED TO THE GRAVITY MAIN AND CAPPED ON BOTH ENDS.

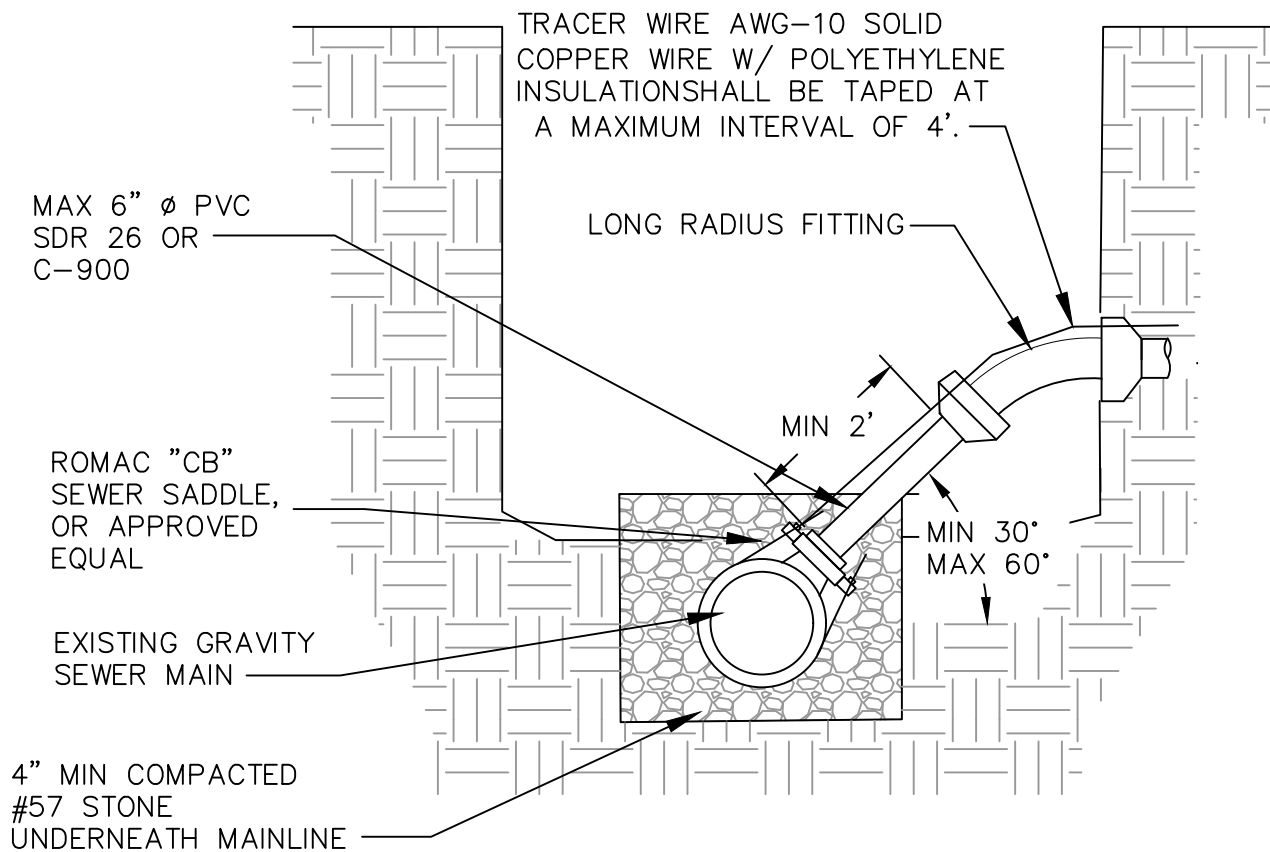
NOT TO SCALE



STANDARD DESIGN DETAIL

SANITARY SERVICE LATERAL DEACTIVATION

DRAWING NO. 231
SHEET 1 OF 1
DATE 7/2026



NOTES:

1. MIN OF 2' OF STRAIGHT PIPE FROM CONNECTION IS REQUIRED BEFORE INSTALLING ANY FITTING.
2. 4" SADDLE SHALL BE COMPLETELY ENCOMPASSED WITH COMPACTED #57 STONE.
3. TERMINATION OF TRACER WIRE SHALL BE AT THE BOLTS OF ROMAC FITTING. EXPOSED BARE COPPER SHALL BE WRAPPED AROUND THE BOLTS.
4. THIS DETAIL SHALL BE USED ON A CASE BY CASE BASIS, AND CONTINGENT UPON HRSD APPROVAL.

NOT TO SCALE



STANDARD DESIGN DETAIL

ALTERNATIVE SERVICE LATERAL CONNECTION  
TO EXISTING GRAVITY SEWER MAIN

DRAWING NO.

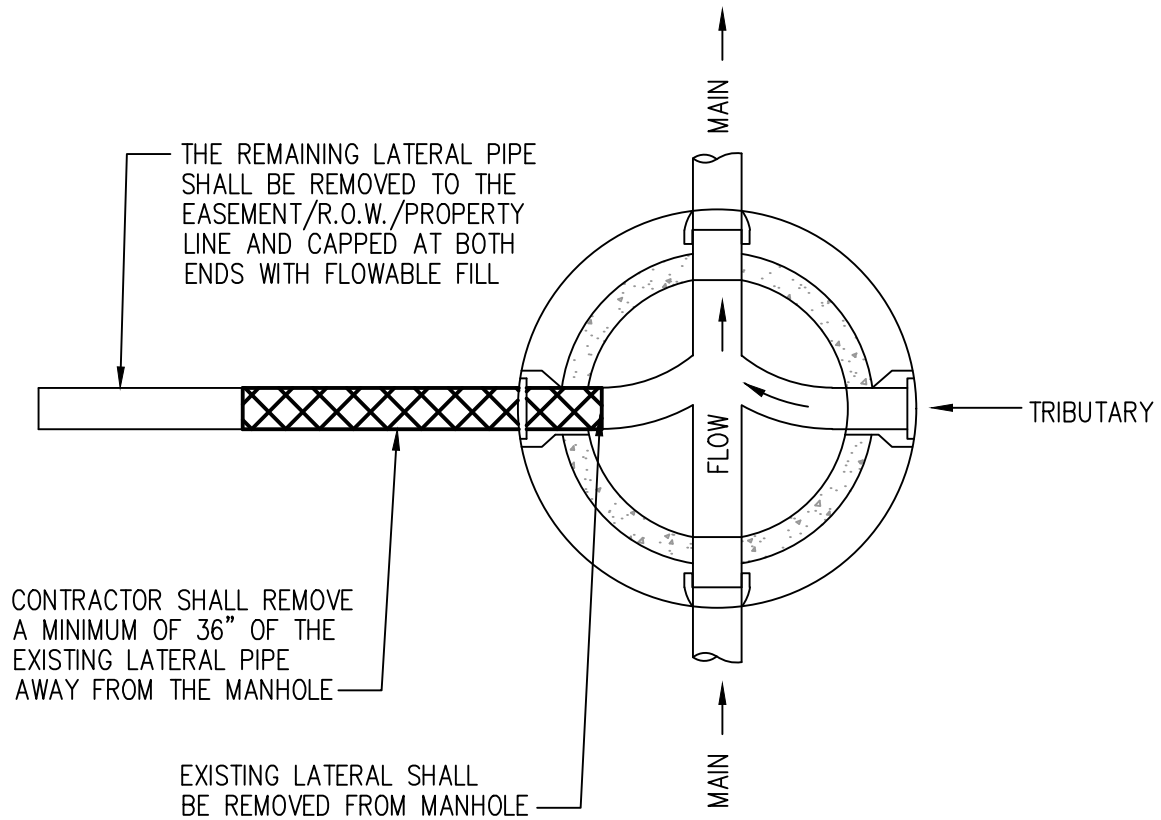
232

SHEET

1 OF 1

DATE

7/2026



NOTES:

1. VOID (CREATED FROM THE REMOVED LATERAL) SHALL BE FILLED WITH CONCRETE THAT HAS CONSHIELD ADDITIVE.
2. THE EXTERIOR SURFACE SHALL BE PARGED WITH NON-SHRINK HIGH STRENGTH GROUT.

NOT TO SCALE



STANDARD DESIGN DETAIL

HRSD MANHOLE PERMANENT  
SERVICE LATERAL DEACTIVATION

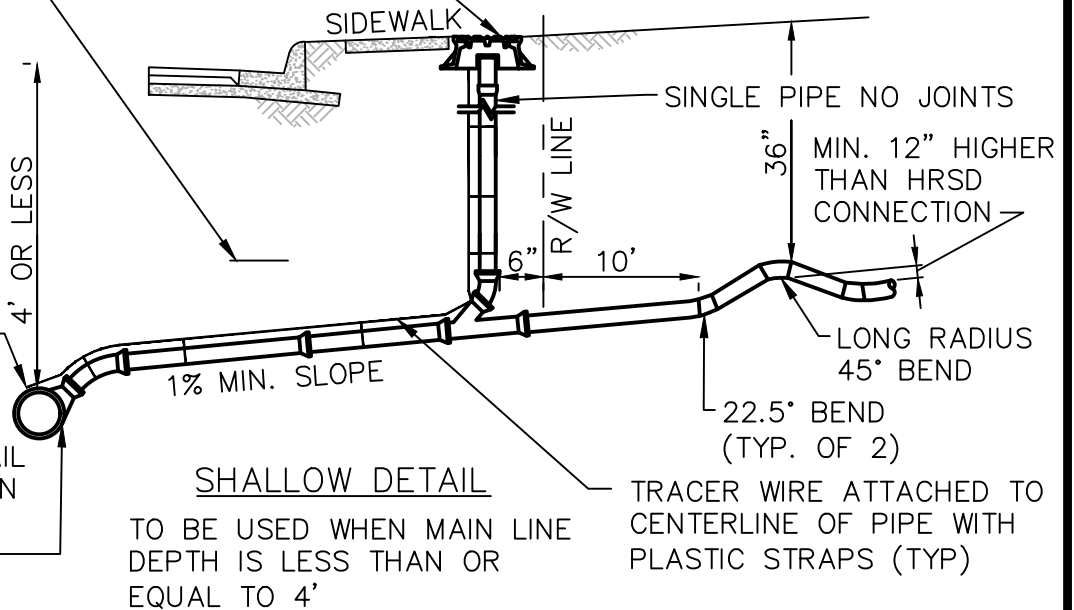
DRAWING NO. 233
SHEET 1 OF 1
DATE 7/2026

DETECTABLE TAPE  
(SEE NOTE 5)

SEE STANDARD  
DETAIL #251, IF  
APPLICABLE #252

INSTALL HEAT  
SHRINK TUBING.  
TUBING SHALL  
OVERLAP END OF  
TRACER WIRE A  
MIN. OF 3" OF  
POLYETHYLENE  
INSULATION

SEE HRSD DETAIL  
FOR CONNECTION  
TO NEW OR  
EXISTING MAIN



SHALLOW DETAIL

TO BE USED WHEN MAIN LINE  
DEPTH IS LESS THAN OR  
EQUAL TO 4'

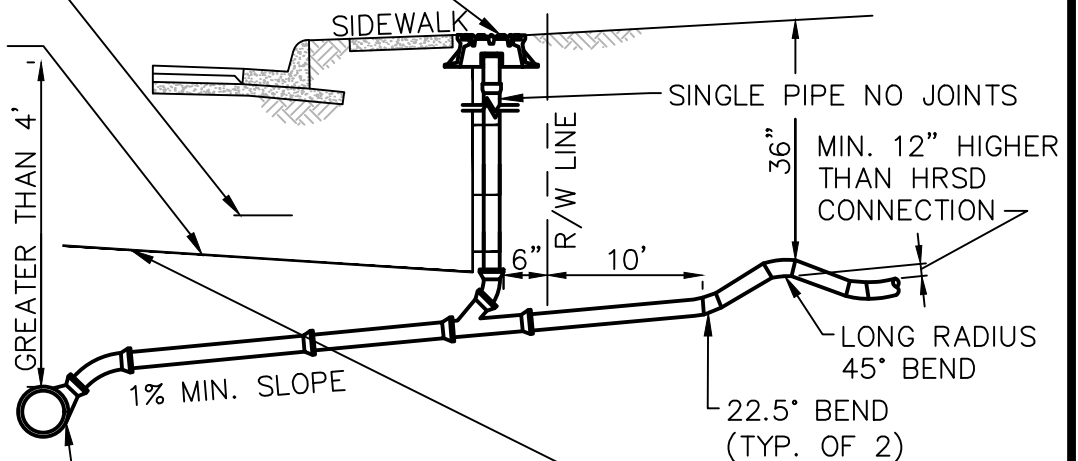
TRACER WIRE ATTACHED TO  
CENTERLINE OF PIPE WITH  
PLASTIC STRAPS (TYP)

DETECTABLE TAPE  
(SEE NOTE 5)

SEE STANDARD  
DETAIL #251, IF  
APPLICABLE #252

TRACER WIRE BURIED  
OVER CENTERLINE OF  
PVC PIPE 3' BELOW  
GRADE

SEE HRSD DETAIL FOR  
CONNECTION TO NEW OR  
EXISTING MAIN



DEEP DETAIL

TO BE USED WHEN MAIN LINE  
DEPTH IS GREATER THAN 4'

INSTALL HEAT SHRINK  
TUBING. TUBING SHALL  
OVERLAP END OF  
TRACER WIRE A MIN OF  
3" OF POLYETHYLENE  
INSULATION

\*SEE SHEET 2 FOR NOTES

NOT TO SCALE



STANDARD DESIGN DETAIL

PRIVATE FORCE MAIN TO  
HRSD GRAVITY MAIN CONNECTION

DRAWING NO.  
234A

SHEET  
1 OF 2

DATE  
7/2026

NOTES:

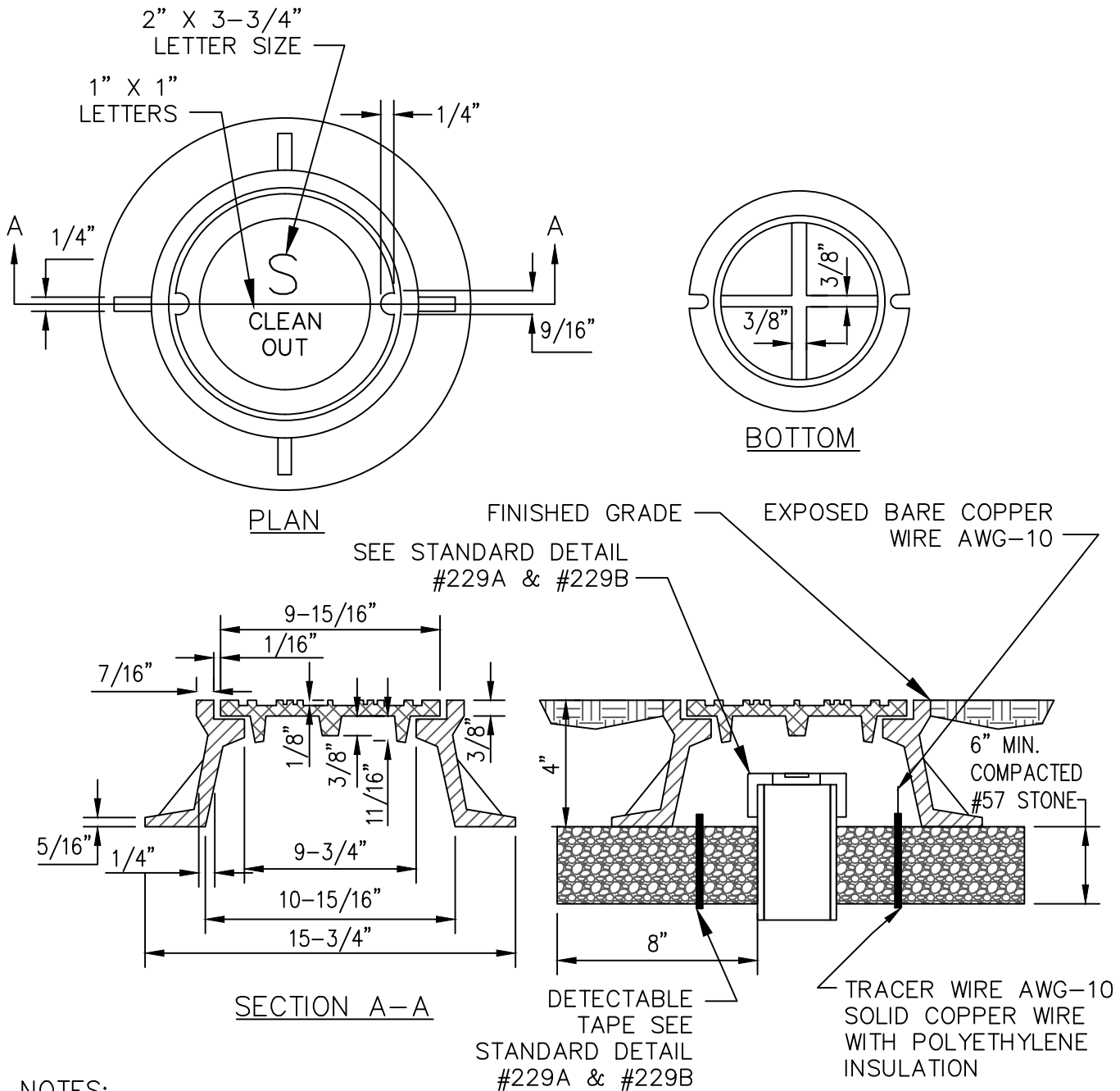
1. TYPICAL LATERAL LAYOUT:
  - 1.1. SHALL ONLY UTILIZE THE PRIMARY CONNECTION POINT WHEN TYING TO AN EXISTING LATERAL.
  - 1.2. THE CONNECTION POINT TO THE PRIVATE LATERAL AND TO THE SANITARY SERVICE LATERAL CLEANOUT SHALL BE MADE WITH SOLID SLEEVES.
  - 1.3. FERNCO COUPLINGS OR EQUIVALENTS ARE NOT PERMITTED ON THE LATERAL CONNECTION.
  - 1.4. CLEANOUT RISER ASSEMBLY AND FITTING SHALL BE SAME MATERIAL AS THE SEWER LATERAL.
2. CLEANOUT RISER ASSEMBLY, LATERAL CLEANOUT AND TRACER WIRE SHALL BE INSTALLED PRIOR TO FINAL INSPECTION/ACCEPTANCE. LOCATION OF WYE AND CLEANOUT MAY BE VARIED BY HRSD STAFF IF NECESSARY DUE TO UNUSUAL DEPTH OR CONDITIONS. MINIMUM COVER OF 3.0 FEET REQUIRED FOR SERVICE.
3. LATERAL MATERIAL SHALL BE POLYVINYLCHLORIDE (P.V.C.). ASTM D-3034 SDR 26, AWWA C900-CLASS 150 (DR-18) OR ASTM D-1785 SCHEDULE 40. FOR DEPTHS LESS THAN 2' OR GREATER THAN 10' CONTACT HRSD FOR PIPE MATERIAL.
4. TRACER WIRE SHALL BE AWG 10 SOLID COPPER WIRE WITH POLYETHYLENE INSULATION. THE TRACER WIRE SHALL BE ATTACHED TO THE LATERAL PIPE WHEN THE DEPTH IS NO GREATER THAN 4.0 FEET. THE WIRE SHALL BE BURIED OVER THE CENTERLINE OF THE LATERAL PIPE AT 3.0 FEET BELOW GRADE WHEN THE LATERAL DEPTH IS GREATER THAN 4.0 FEET.
5. INSTALL DETECTABLE WARNING TAPE CONTINUOUSLY FROM THE MAIN TO THE HRSD CLEANOUT 1' ABOVE TOP OF TRACER WIRE. TAPE SHALL BE GREEN IN COLOR AND STATE " CAUTION BURIED SEWER LINE BELOW"
6. CONTRACTOR SHALL UTILIZE NO MORE THAN FOUR (4) FITTINGS FROM THE HRSD CONNECTION POINT TO THE HRSD CLEANOUT.
7. SAXOPHONE CONNECTION TO PRIVATE FORCE MAIN SHALL OCCUR ON PRIVATE PROPERTY AT 10' FROM HRSD CONNECTION AND SHALL BE PART OF THE PRIVATE FORCE MAIN INSTALLATION.



STANDARD DESIGN DETAIL

PRIVATE FORCE MAIN TO  
HRSD GRAVITY MAIN CONNECTION

DRAWING NO.	234B
SHEET	2 OF 2
DATE	7/2026



NOTES:

1. CLEAN OUT FRAME & COVER TO BE PART NUMBER NPN-CW-18 SUPPLIED BY CAPITAL FOUNDRY OF VIRGINIA, INC. OR APPROVED EQUAL.
2. ALL GRAY IRON CASTINGS SHALL CONFORM TO LATEST EDITION OF ASTM A-48, CLASS 30 AND SHALL BE OF UNIFORM QUALITY.
3. ALL CASTING DIMENSIONS SHALL HAVE A TOLERANCE OF 1/8"±
4. ALL CASTINGS SHALL BE CLEANED BY SHOT BLASTING AND HAND CHIPPING UTILIZING STANDARD
5. INDUSTRY PRACTICES PRIOR TO SHOP APPLICATION OF ASPHALTIC COATING, BY DIPPING.
6. THE TRACER WIRE POLYETHYLENE INSULATION SHALL ONLY FROM THE LAST INCH. TRACER WIRE SHALL HAVE A SURPLUS OF 2' OF WIRE CONNECTED INSIDE OF CASTING.
7. SEE MASTER SPEC SECTION 01340 FOR AMERICAN IRON AND STEEL REQUIREMENT.

NOT TO SCALE



STANDARD DESIGN DETAIL

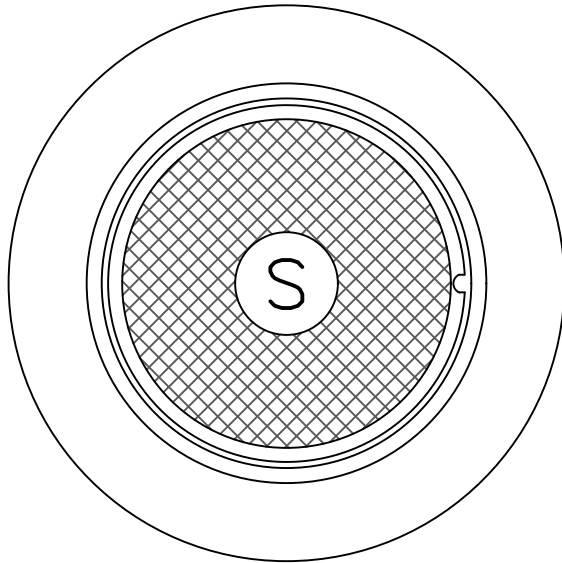
SANITARY SEWER SERVICE CLEAN

OUT FRAME AND COVER (NON-TRAFFIC RATED)

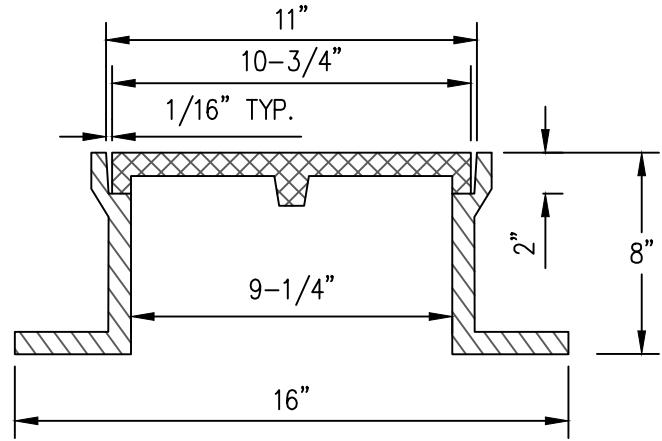
DRAWING NO.  
251

SHEET  
1 OF 1

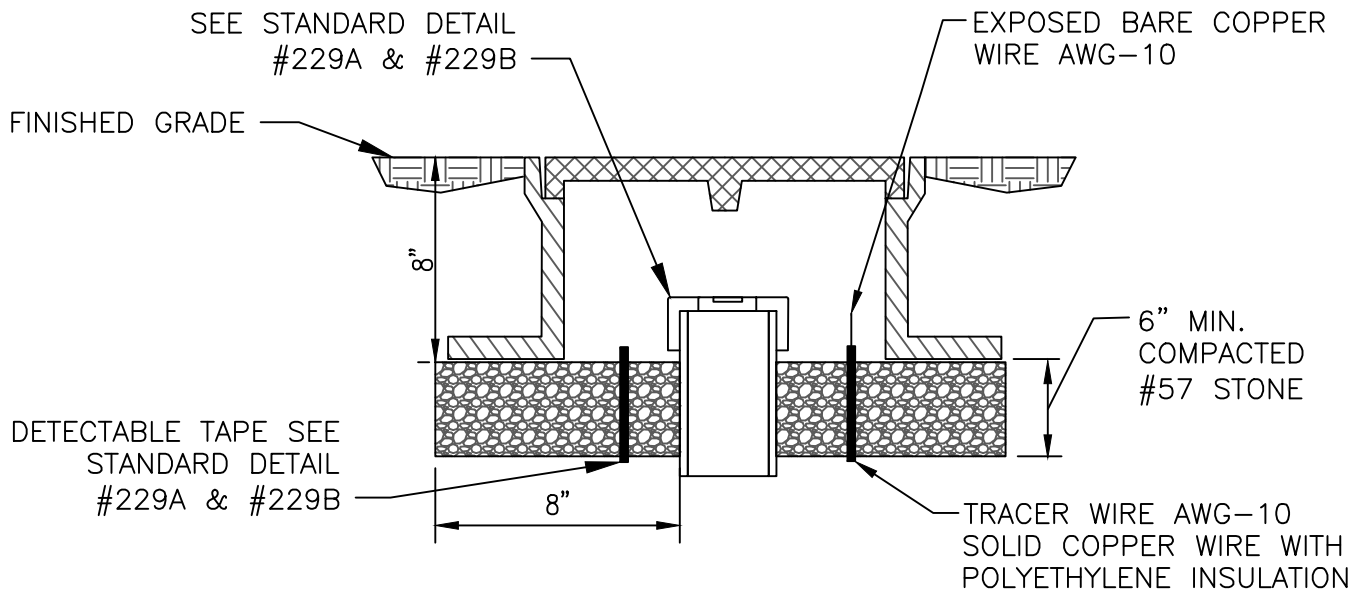
DATE  
7/2026



PLAN



SECTION A-A



NOTES:

1. CLEAN OUT FRAME & COVER HIGHWAY LOAD RATED FOR USE IN DRIVEWAYS, PARKING LOTS, ETC.
2. CLEAN OUT FRAME & COVER TO BE PART NUMBER VB-9\*S SUPPLIED BY CAPITAL FOUNDRY OF VIRGINIA, INC. OR APPROVED EQUAL.
3. ALL GRAY IRON CASTINGS SHALL CONFORM TO LATEST EDITION OF ASTM A-48, CLASS 30 AND SHALL BE OF UNIFORM QUALITY.
4. ALL CASTING DIMENSIONS SHALL HAVE A TOLERANCE OF  $1/8'' \pm$
5. ALL CASTINGS SHALL BE CLEANED BY SHOT BLASTING AND HAND CHIPPING UTILIZING STANDARD INDUSTRY PRACTICES PRIOR TO SHOP APPLICATION OF ASPHALTIC COATING, BY DIPPING.
6. SEE MASTER SPEC SECTION 01340 FOR AMERICAN IRON AND STEEL REQUIREMENT.

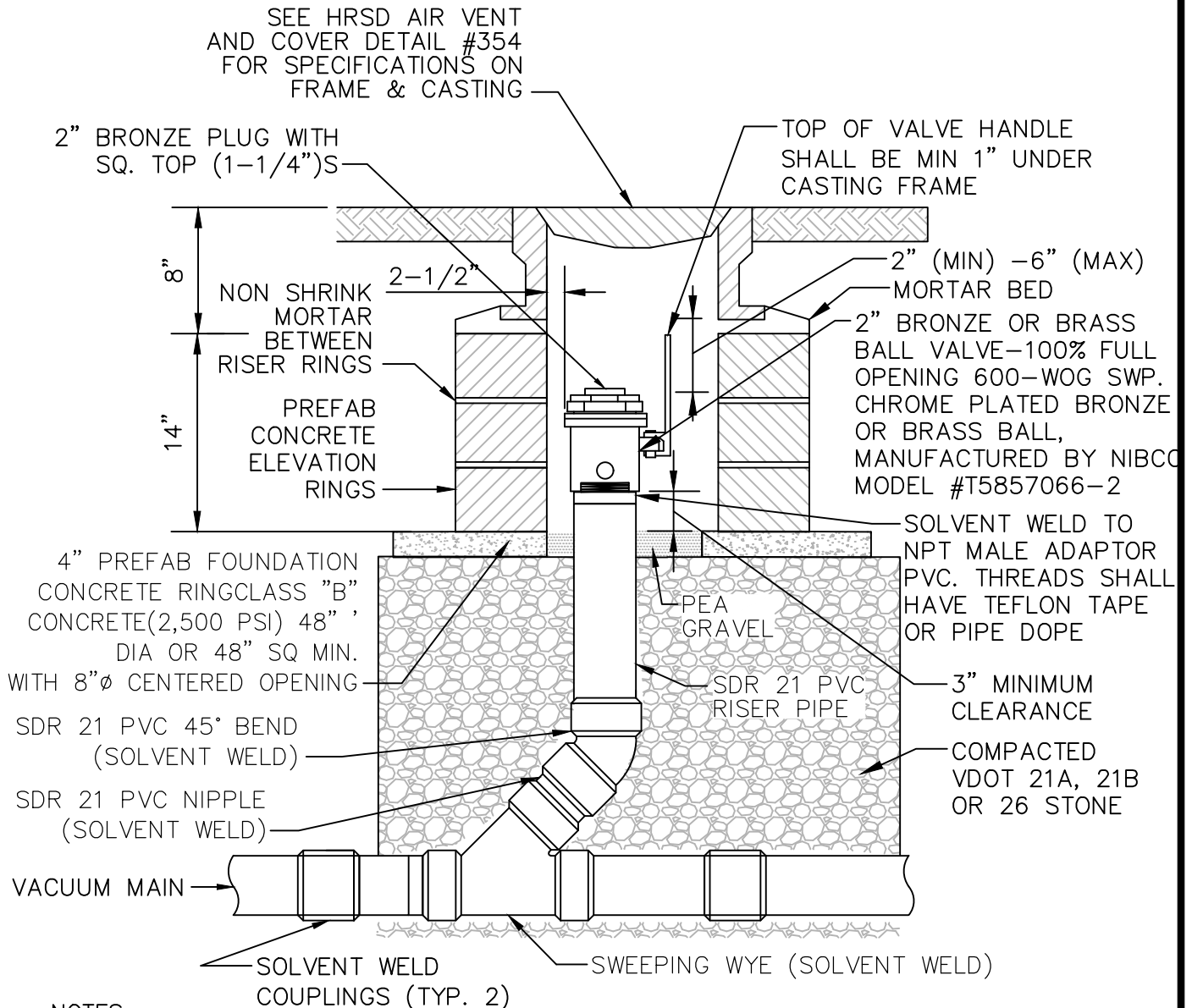
NOT TO SCALE



STANDARD DESIGN DETAIL  
SANITARY SEWER SERVICE CLEAN  
OUT FRAME AND COVER (TRAFFIC RATED)

DRAWING NO.  
252  
SHEET  
1 OF 1  
DATE  
7/2026

NOTE: HANDLE AS SHOWN IS VALVE  
INSTALLED IN OPEN POSITION



**NOTES:**

1. CONSTRUCT AIR INTAKE VALVE WITH CONCRETE ELEVATION RINGS AS MANUFACTURED BY NANSEMOND PRE-CAST CONCRETE CO, INC. MODEL AV-ER-CH AND AV-BS.
2. JACK UP RINGS BETWEEN THE FRAME AND COVER NOT ACCEPTABLE.
3. PARGE CONCRETE ELEVATION RINGS WITH GROUT INSIDE AND OUT, CONTINUE ONTO CASTING.
4. IF REDUCERS ARE REQUIRED THEY MUST BE INSTALLED ONTO SWEEPING WYE
5. SOLVENT WELD PVC COUPLING SHALL BE USED TO CONNECT SWEEPING WYE TO EXISTING VACUUM MAIN
6. ACCEPTED WYES ARE 6"X6"X4", 6"X6"X2", AND 4"X4"X2"
7. WYE SHALL MATCH VACUUM MAIN DIAMETER
6. TEES WITH THE FOLLOWING DIMENSIONS CAN BE USED 6"X6"X2", AND 4"X4"X2"

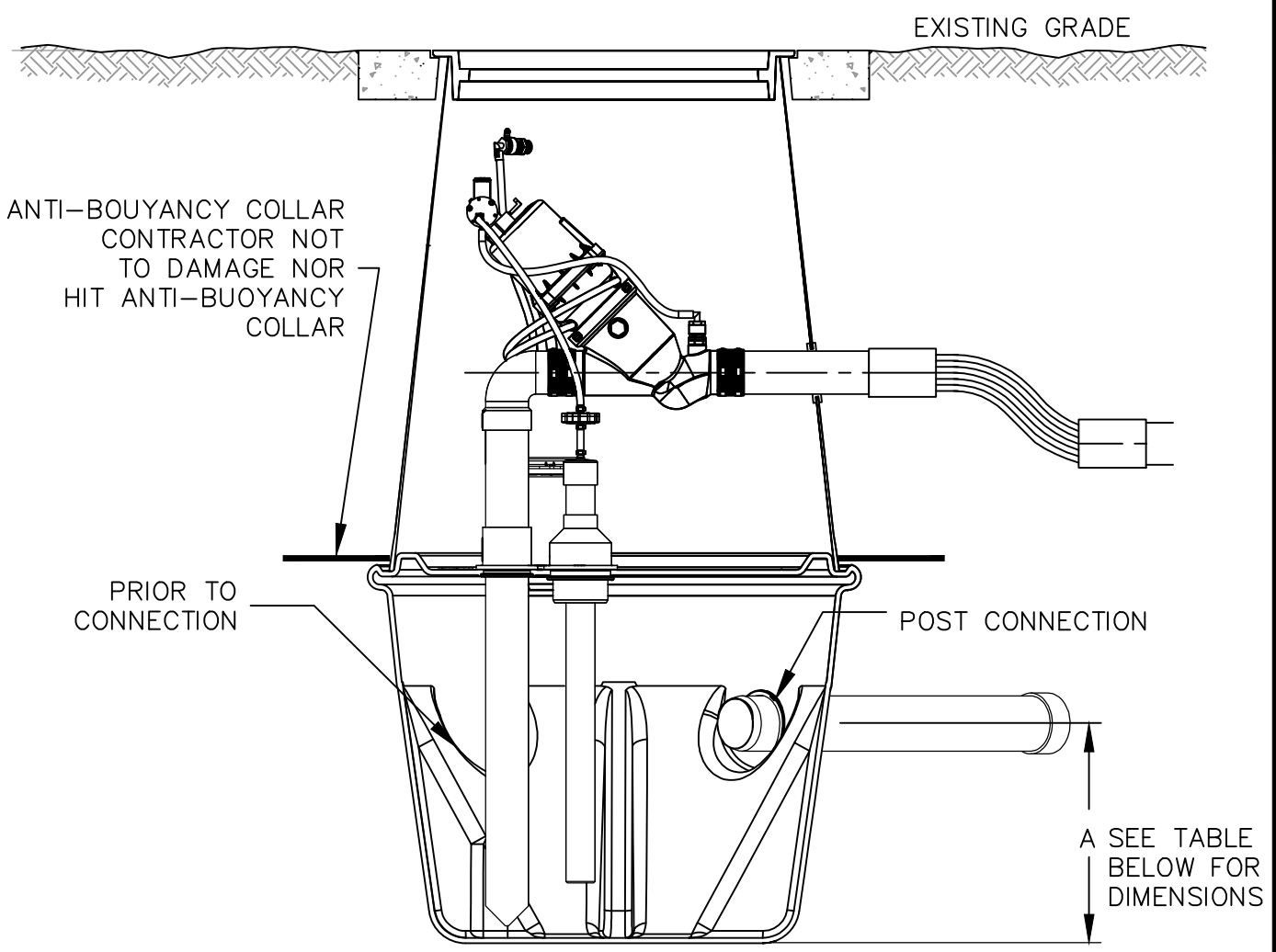
NOT TO SCALE



STANDARD DESIGN DETAIL

VACUUM AIR INTAKE VALVE

DRAWING NO. 276
SHEET 1 OF 1
DATE 7/2026



NOTES:

SEQUENCE FOR CONNECTION

- 1) CONTRACTOR WILL HAVE TO EXCAVATE TO THE BOTTOM THE EXISTING VALVE PIT
- 2) UTILIZING THE TABLE TO THE RIGHT MEASURE AND MARK THE CENTER OF A 5" CORE HOLE
- 3) CORE A 5" HOLE INTO THE SUMP AND INSTALL A 4" DOUBLE LIP SEAL RUBBER GROMMET WITH 4" SCH 40 PVC PIPE

\*NOTE IF THE LATERAL IS 6" CORE WILL BE 7" AND CONTRACTOR WILL UTILIZE 6" DOUBLE LIP SEAL RUBBER GROMMET

	4" GRAVITY	6" GRAVITY
DIM "A"	1'-6"	1'-7"

NOT TO SCALE



STANDARD DESIGN DETAIL

LATERAL CONNECTION TO EXISTING VACUUM VALVE PIT

DRAWING NO.  
277

SHEET  
1 OF 1

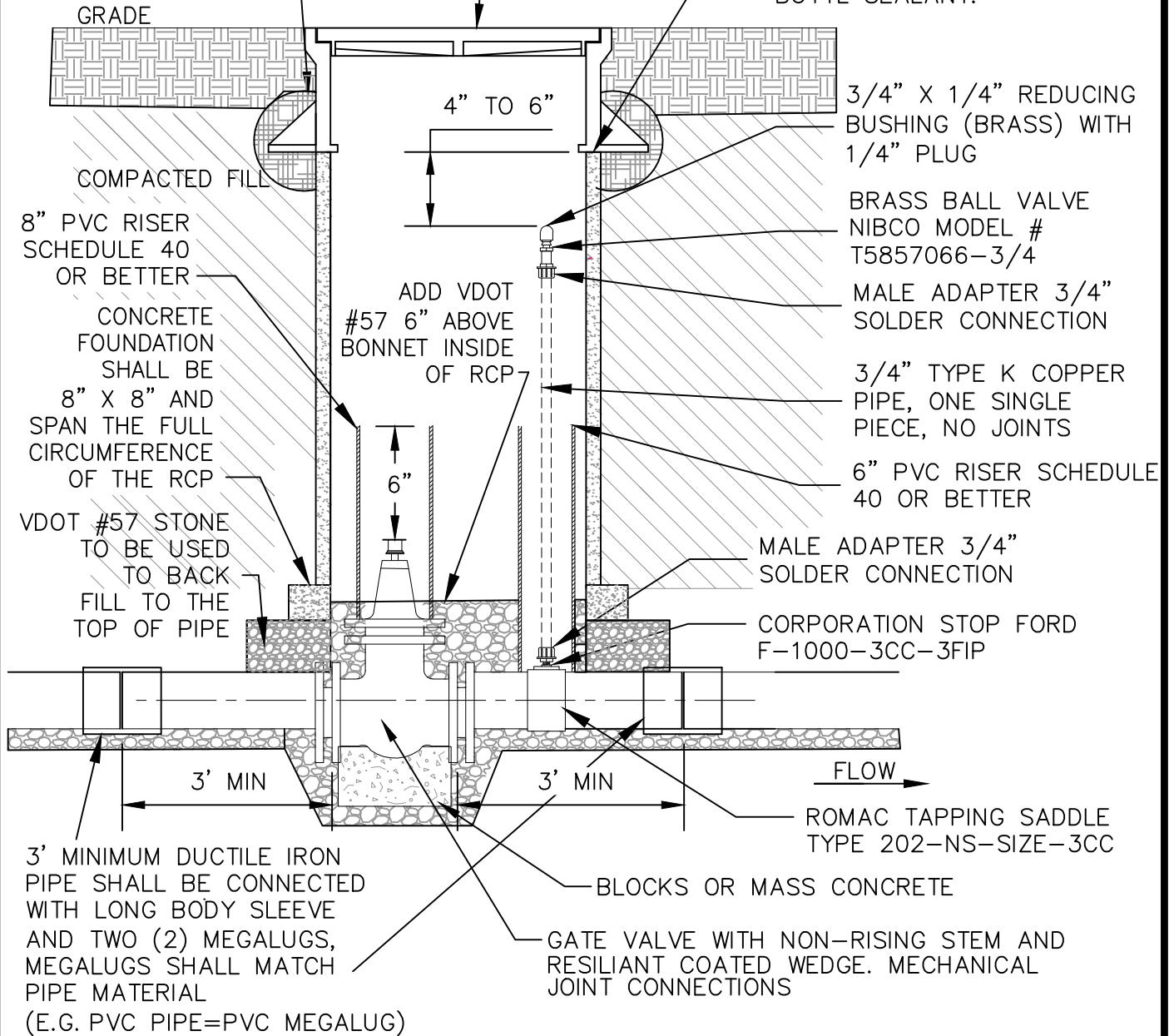
DATE  
7/2026

HRSD 24" MANHOLE FRAME AND COVER (HRSD DETAIL 228, RUBBER GASKET NOT REQUIRED)  
 MANHOLE FRAME SHALL BE SET IN MORTAR BED CENTERED OVER THE RC PIPE

DIVISION VALVE SUPPORT INFORMATION	
VALVE SIZE	SUPPORT SIZE
4"	6" THICK X 1.75' SQUARE
6"	6" THICK X 2.25' SQUARE
8"	6" THICK X 3.00' SQUARE
10"	6" THICK X 3.50' SQUARE

MORTAR BED SHALL BE 8" X 8" AND SPAN THE FULL CIRCUMFERENCE OF THE MANHOLE FRAME

MANHOLE FRAME AND RCP TO BE JOINT SHALL HAVE BUTYL SEALANT.



NOT TO SCALE



STANDARD DESIGN DETAIL

VACUUM SYSTEM DIVISION VALVE

DRAWING NO.  
278

SHEET  
1 OF 1

DATE  
7/2026