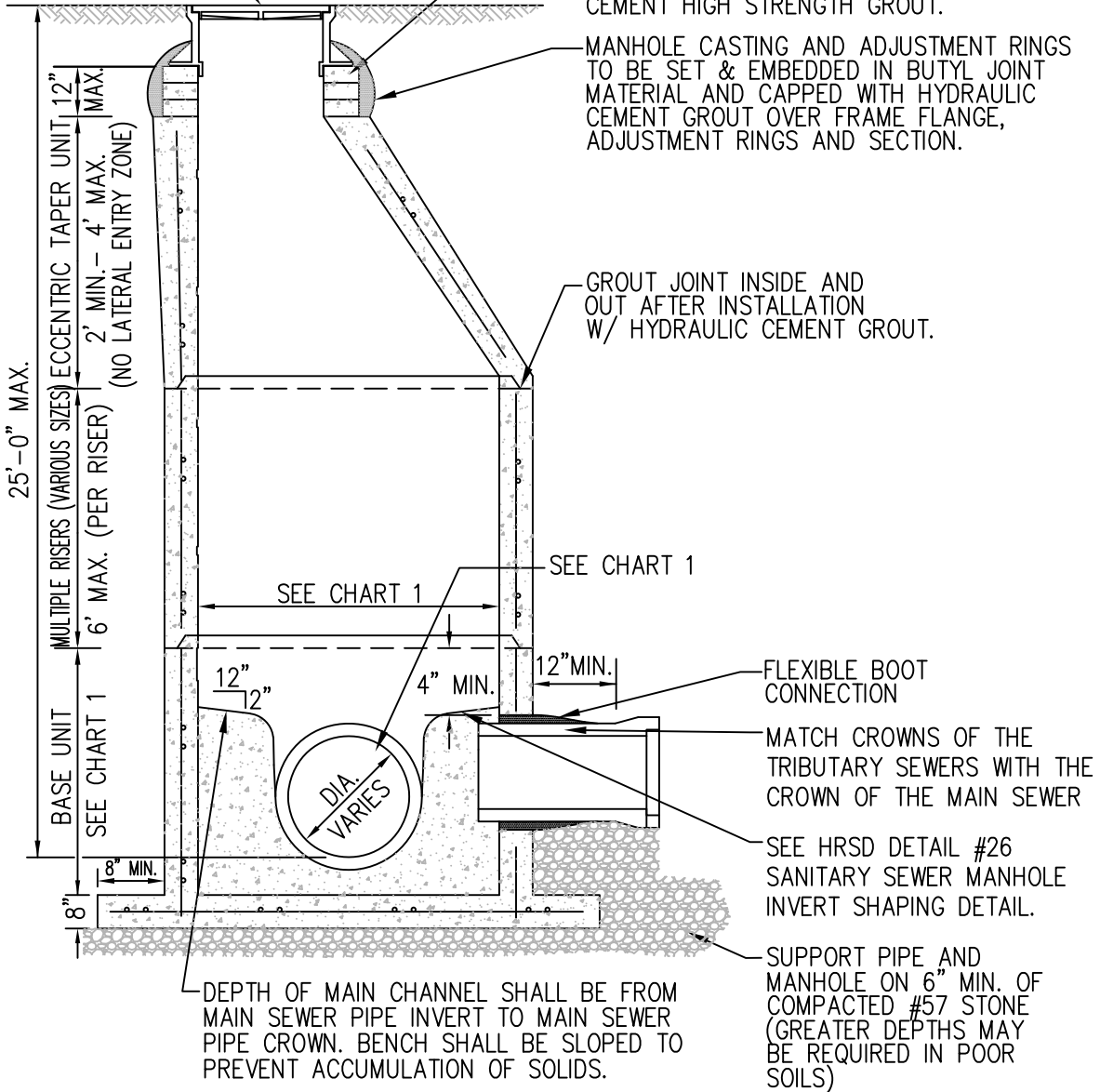


SEE HRSD SANITARY SEWER MANHOLE FRAME AND COVER DETAIL. FRAME AND COVER DETAIL TO BE SPECIFIED BY THE HRSD ENGINEER

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  
1/2021

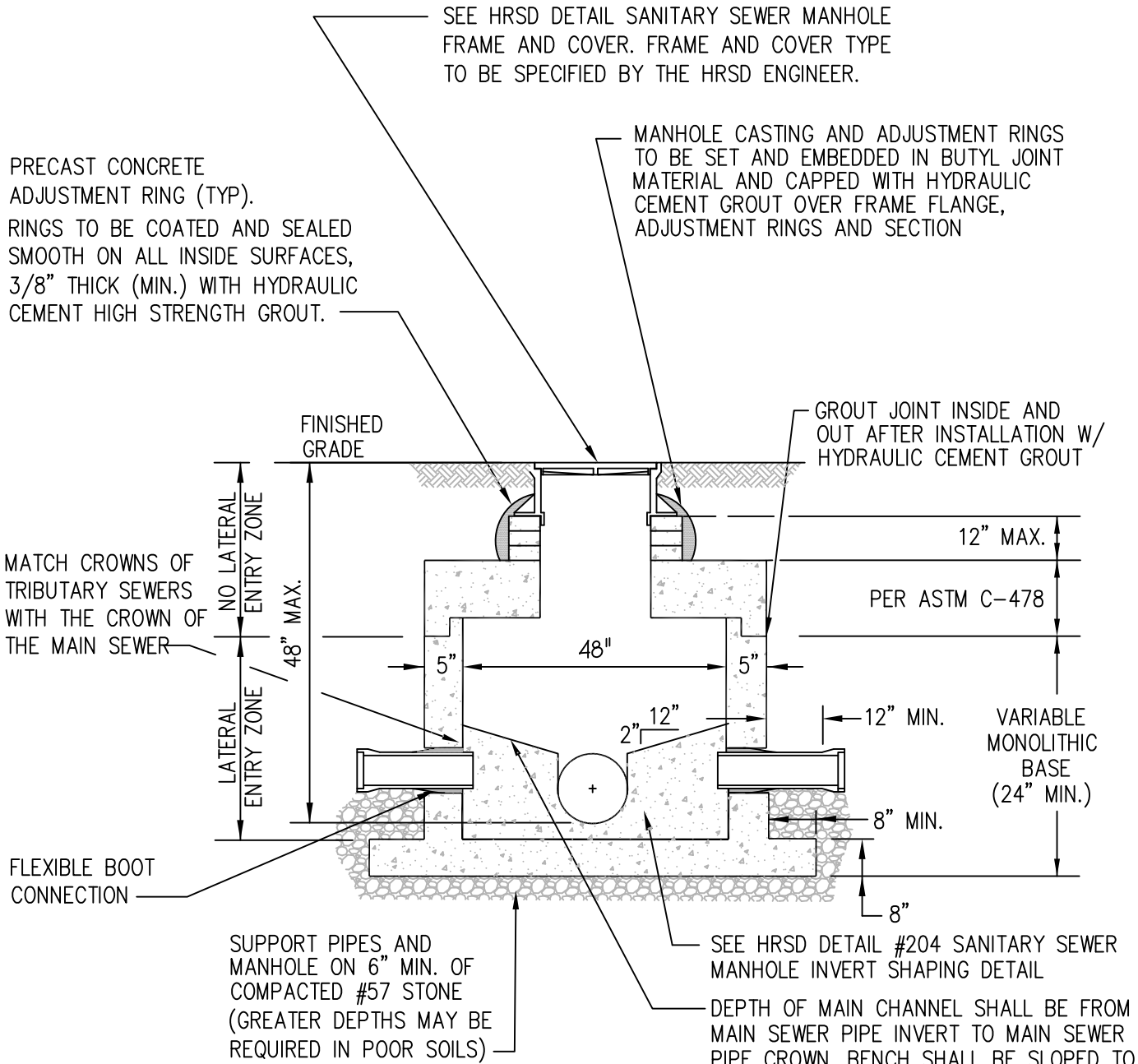
CHART 1

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.


	<b>STANDARD PRECAST CONCRETE</b>	DRAWING NO. 200B
		SHEET 2 OF 2
	<b>MANHOLE W/EXTENDED MONOLITHIC BASE</b>	DATE 1/2021



**NOTES:**

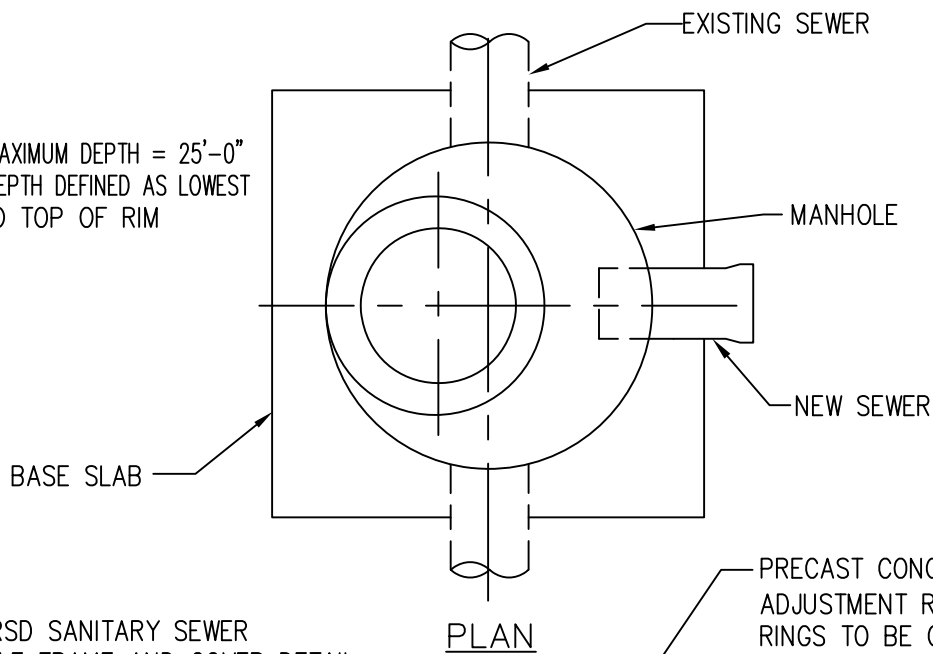
1. FLAT TOP CAN BE REPLACED W/ 1'-4" ECCENTRIC SHALLOW CONE IF APPROVED BY HRSD.
2. PRECAST MANHOLE TO BE IN COMPLIANCE WITH ASTM C-478.
3. PROVIDE A MAXIMUM OF TWO LIFT HOLES PER SECTION. PLUG LIFT HOLES WATERTIGHT WITH RUBBER PLUGS AND GROUT AFTER INSTALLATION.
4. ALL MANHOLES SHALL RECEIVE CONSHIELD ADDITIVE OR APPROVED EQUAL DURING CASTING.
5. CONCRETE USED TO FORM THE BENCH SHALL RECEIVE THE CONSHIELD ADDITIVE, OR APPROVED EQUAL.
6. COAT EXTERIOR OF MANHOLE IN ACCORDANCE WITH THE HRSD COATINGS MANUAL, CURRENT REVISION, COATING SYSTEM E-2-C. COATING SHALL BE FIELD APPLIED.

NOT TO SCALE

	STANDARD DESIGN DETAIL – PRECAST	DRAWING NO. 201
	CONCRETE SHALLOW MANHOLE WITH EXTENDED BASE	SHEET 1 OF 1
		DATE 1/2021

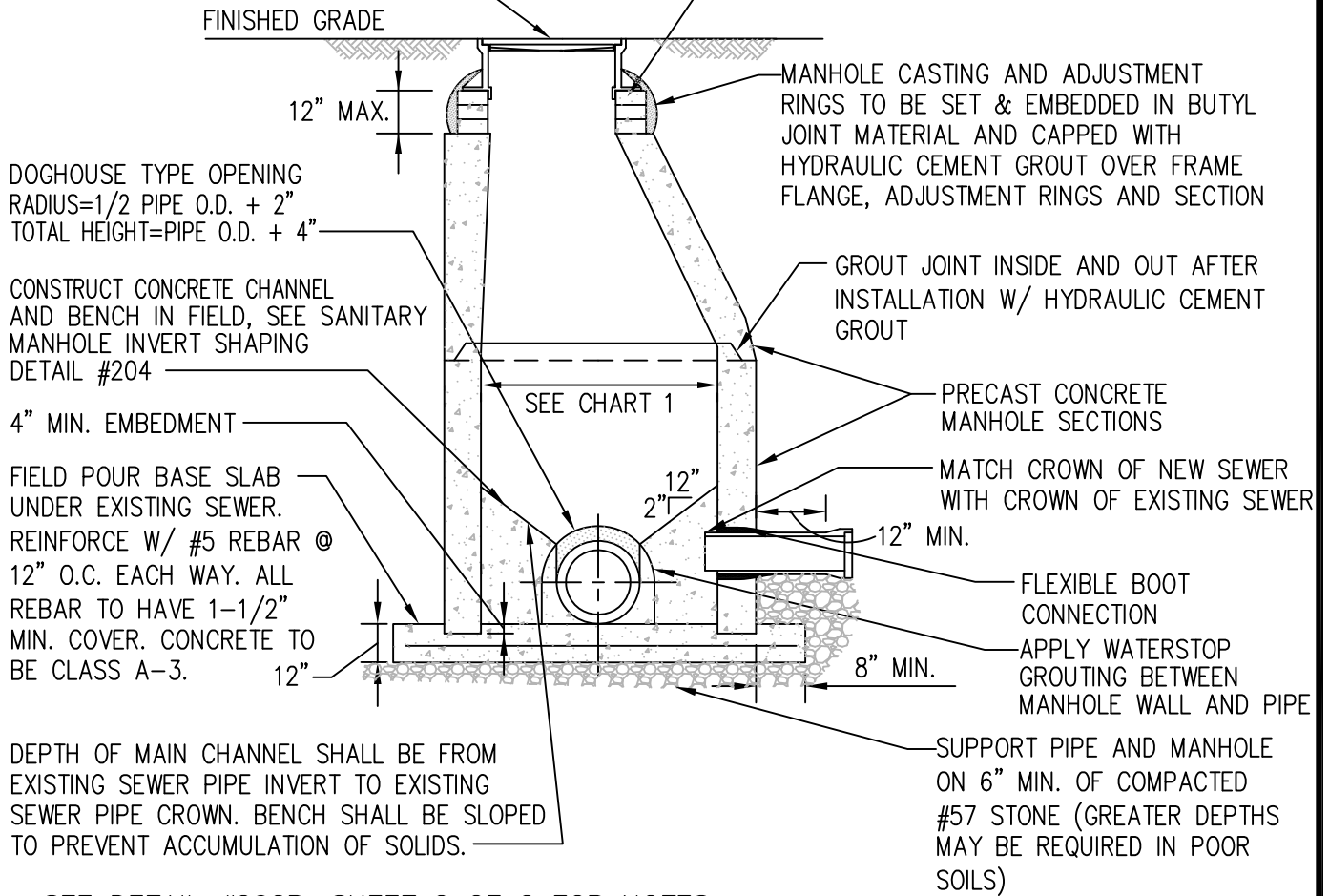
**NOTE:**

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.



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.

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

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)

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  
1/2021

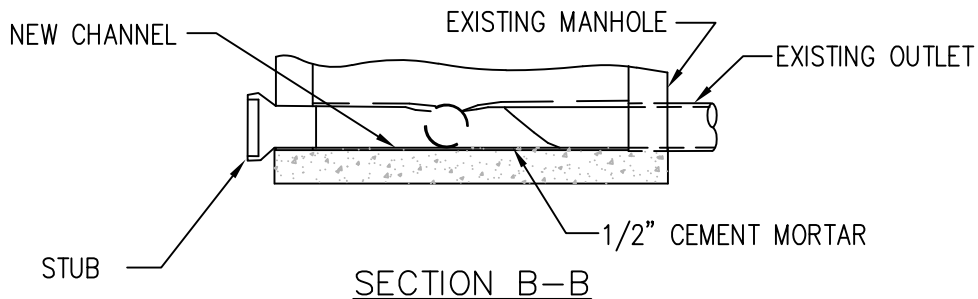
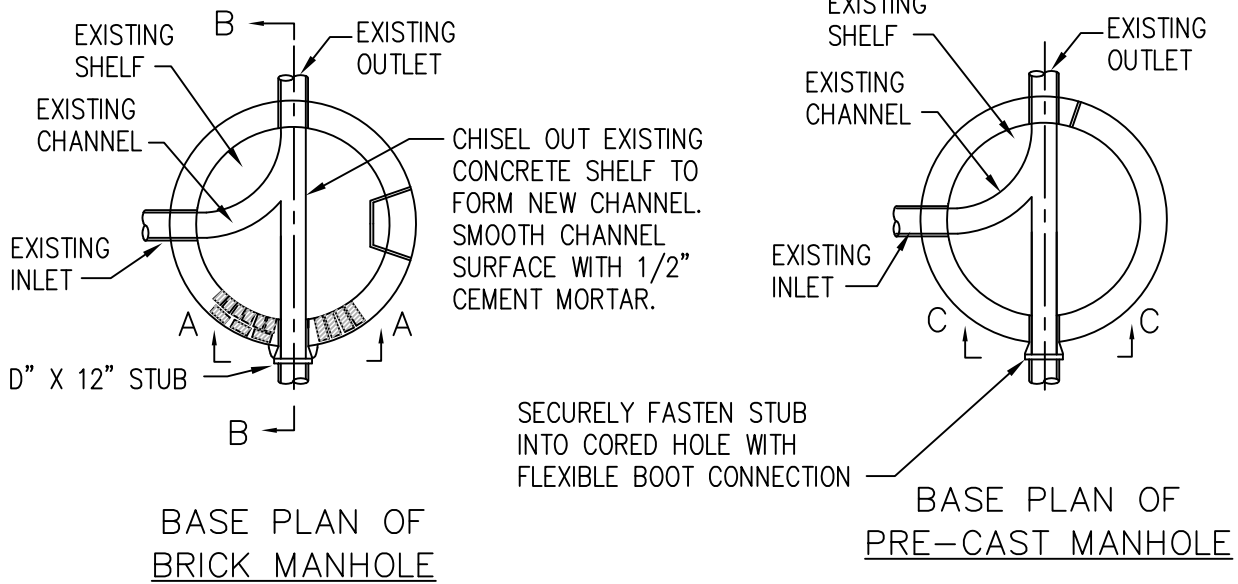
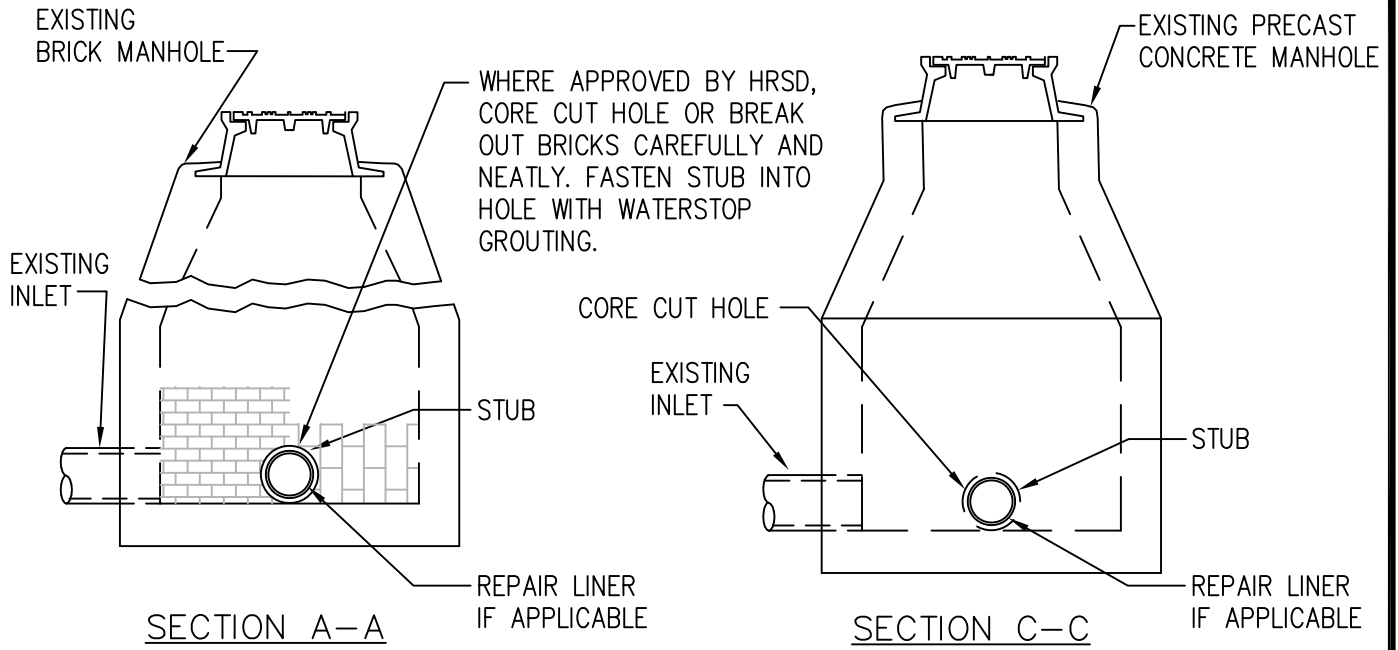
CHART 1

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	DRAWING NO. 202B
		SHEET 2 OF 2
	SANITARY SEWER STRADDLE MANHOLE	DATE 1/2021



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

NOT TO SCALE

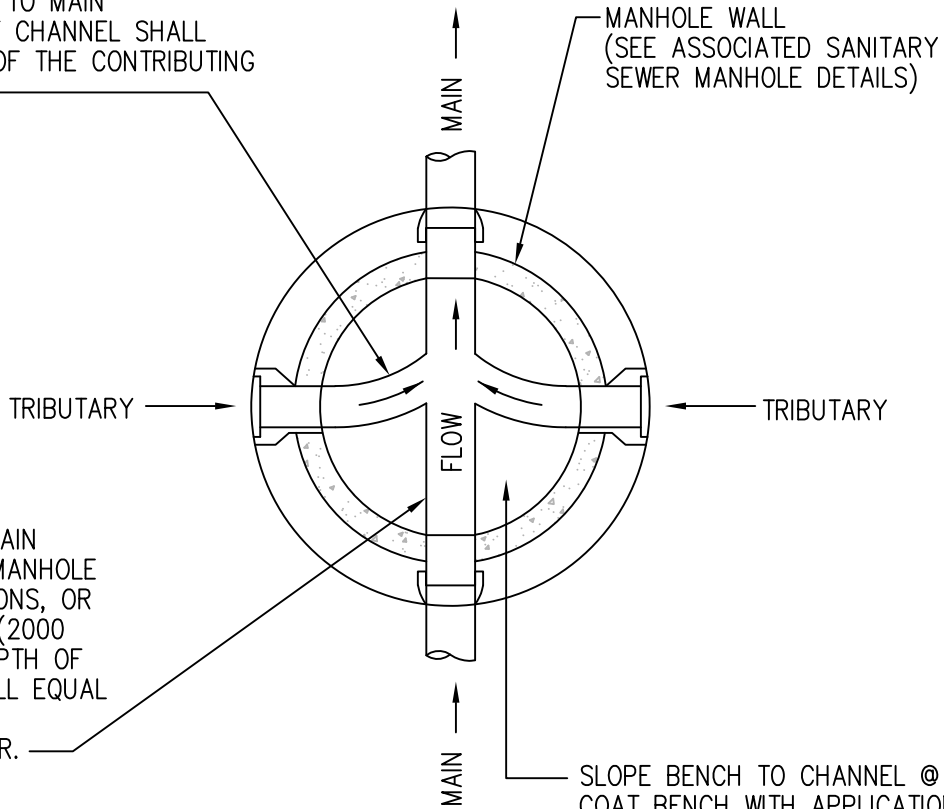


STANDARD DESIGN DETAIL

CONNECTION INTO EXISTING MANHOLES

DRAWING NO.  
203  
SHEET  
1 OF 1  
DATE  
1/2021

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  
 MANHOLE INVERT SHAPING

DRAWING NO. 204
SHEET 1 OF 1
DATE 1/2021

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

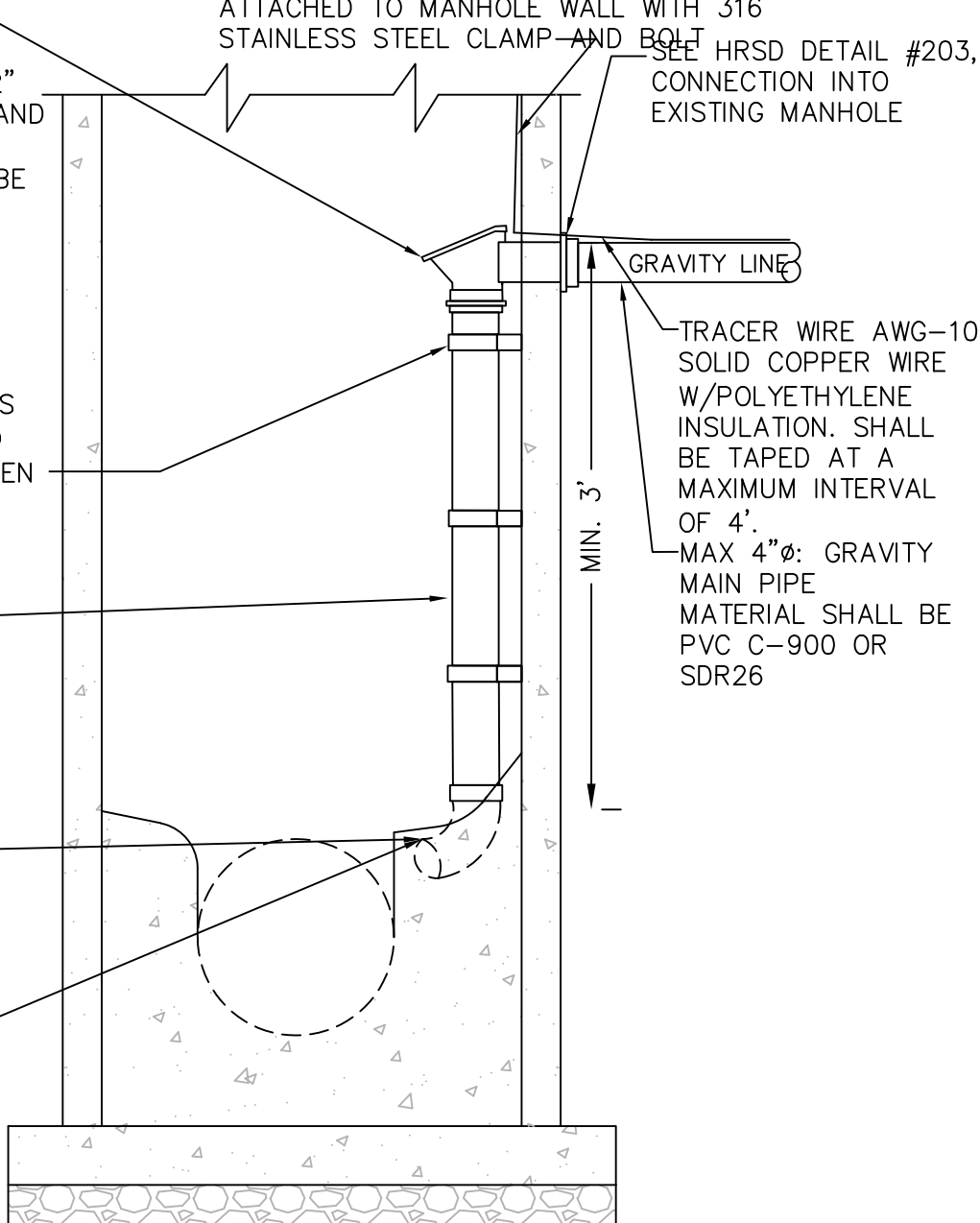
SEE HRSD DETAIL #203,  
CONNECTION INTO  
EXISTING MANHOLE

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



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 PRECAST CONCRETE OR BRICK MANHOLE

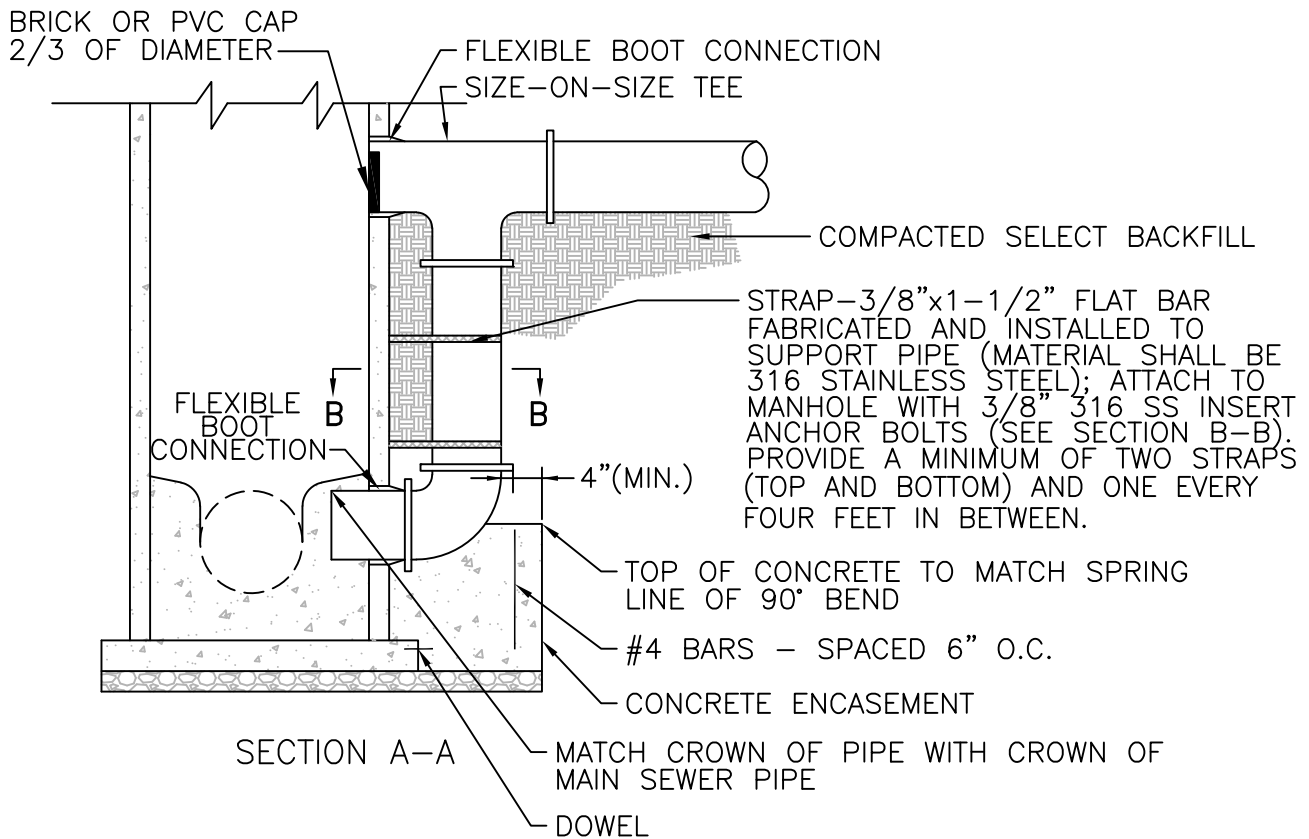
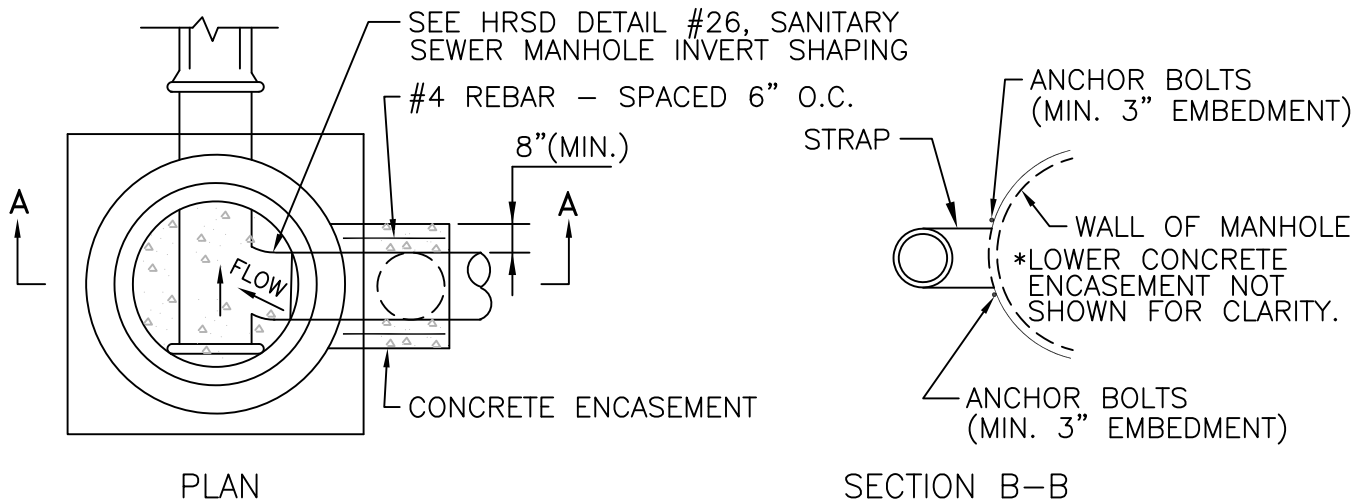
INSIDE GRAVITY DROP CONNECTION  
TO EXISTING MANHOLE

DRAWING NO.  
205

SHEET  
1 OF 1

DATE  
1/2021





NOT TO SCALE



STANDARD PRECAST CONCRETE

OUTSIDE DROP MANHOLE

DRAWING NO. 206
SHEET 1 OF 1
DATE 1/2021

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'

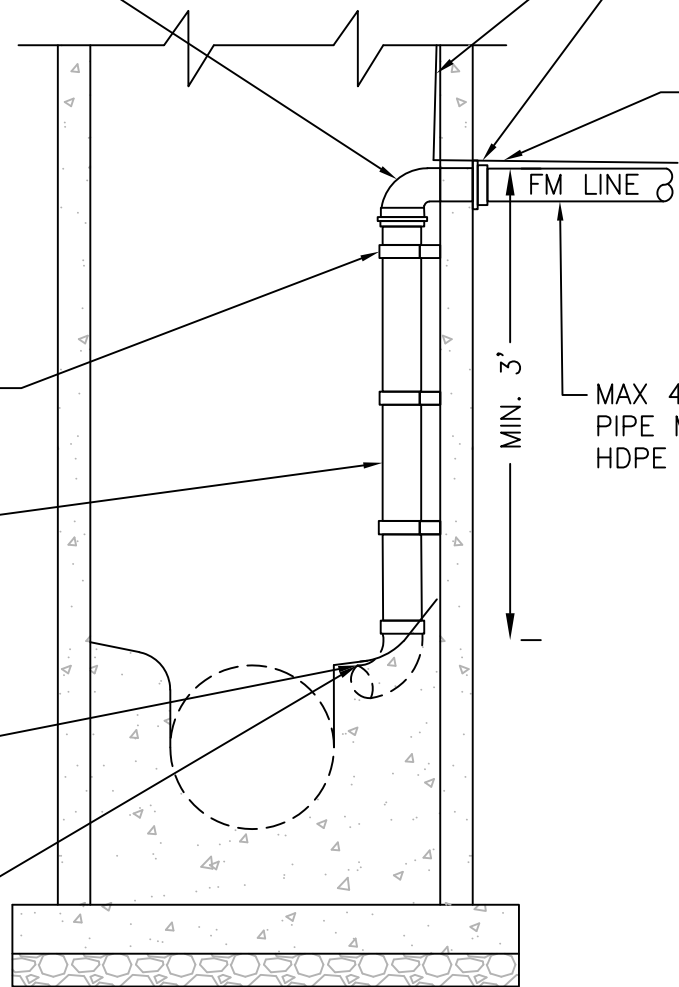
LONG RADIUS 90° BEND

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.

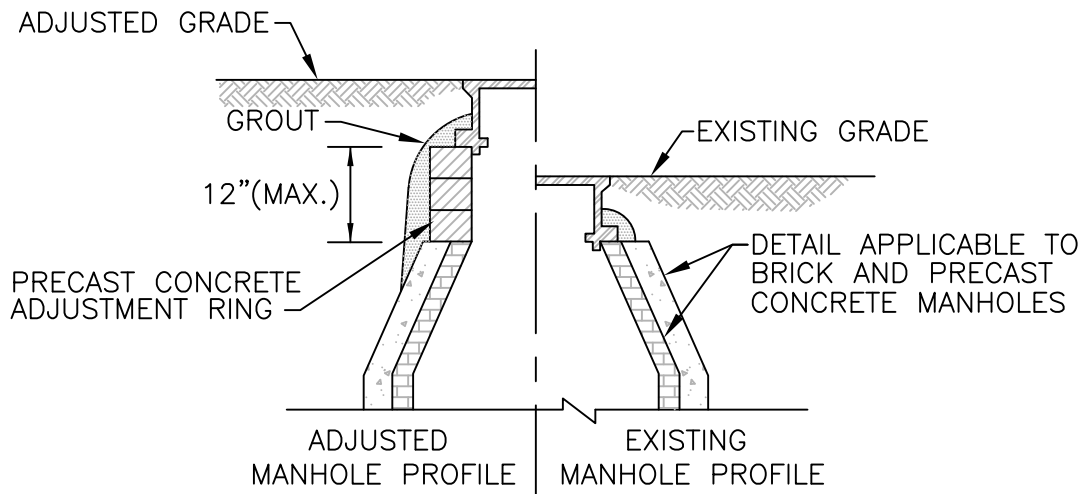
NOT TO SCALE



STANDARD PRECAST CONCRETE OR BRICK MANHOLE

INSIDE FORCE MAIN DROP CONNECTIONS TO EXISTING MANHOLE

DRAWING NO.	207
SHEET	1 OF 1
DATE	1/2021



**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.

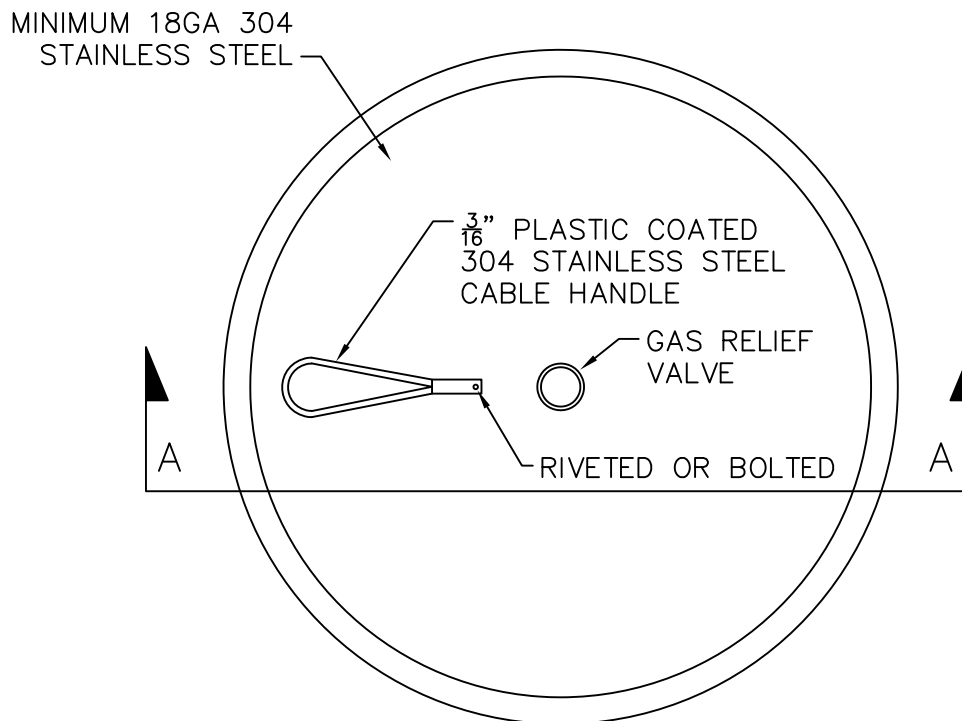
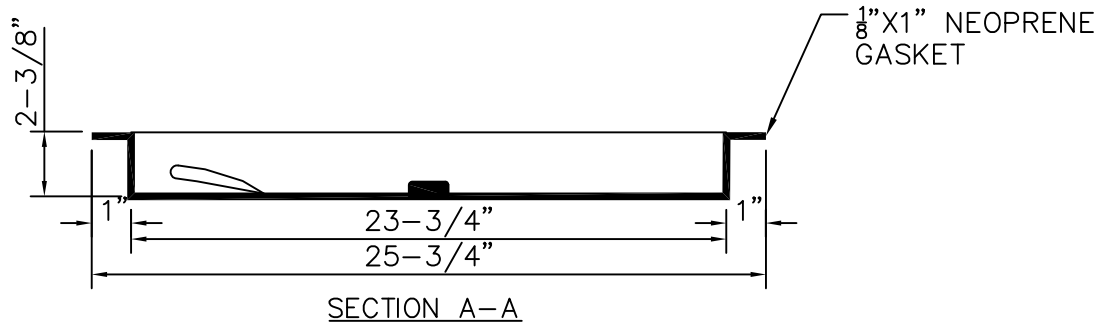
NOT TO SCALE



STANDARD PRECAST CONCRETE

SANITARY SEWER MANHOLE ADJUSTMENT

DRAWING NO. 208
SHEET 1 OF 1
DATE 1/2021



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  
1/2021