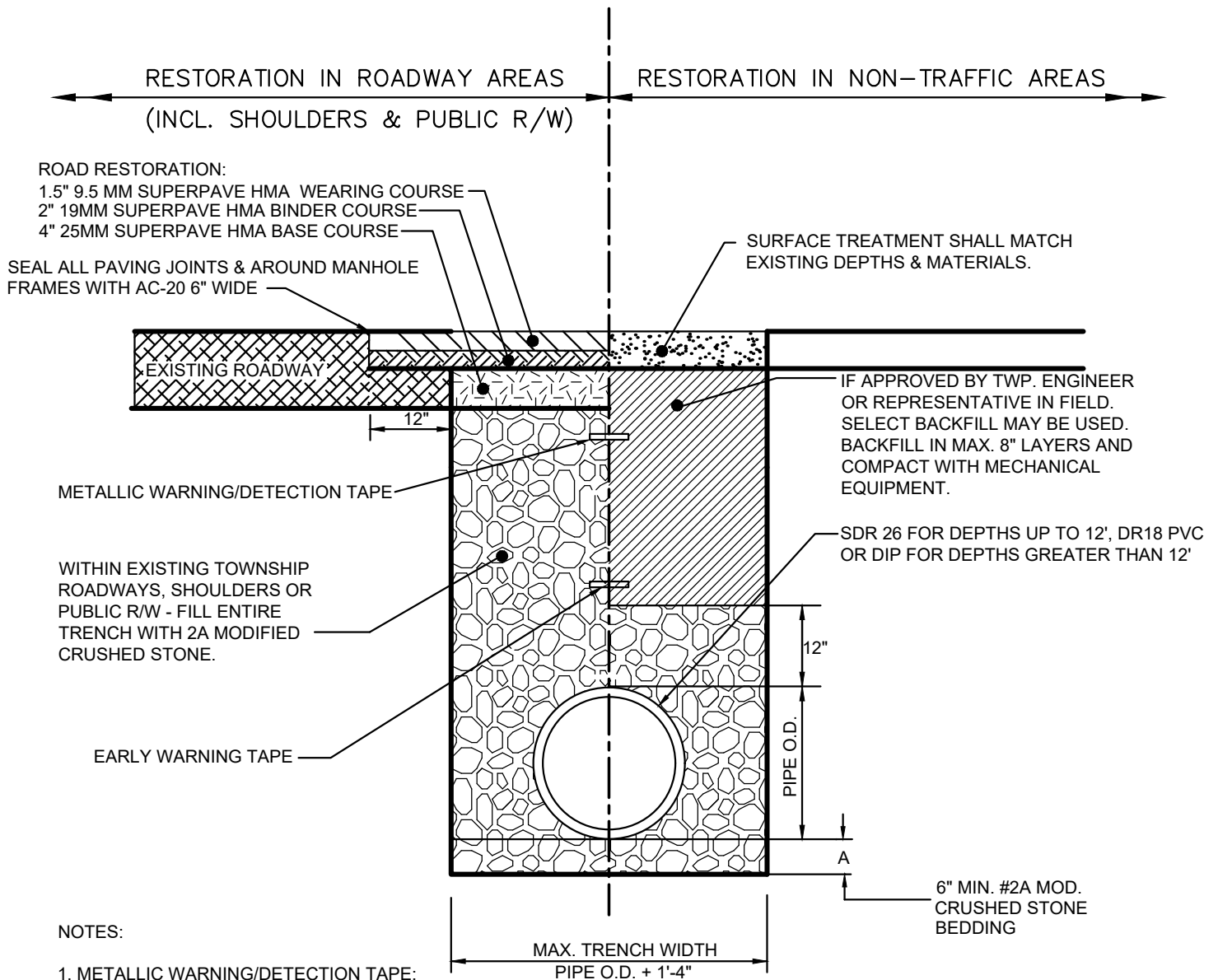


**SANITARY SEWER  
STANDARD DETAILS**

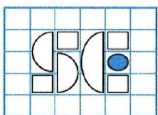
<b>Detail No.</b>	<b>Title</b>	<b>Notes</b>
1	Sanitary Sewer Backfill	
2	House Lateral	
3	Saddle Connection to Existing Sewer	
4	Deep-Cut Lateral Connection	
5	Concrete Encasement	
6	Sewer Protection at Pipe Crossings	
7	Precast Sanitary Manhole	
8	Precast Manhole Base	
9	Precast Manhole Walls and Joints	
10	Manhole Steps	
11	Precast Manhole Top Section	
12	Standard Manhole Frame	
13	Standard Manhole Cover	
14	Watertight Manhole Frame and Cover	
15	Drop Manhole	
16	Shallow Manhole	
17	Connection to Existing Manhole	
18	Doghouse Manhole	
19	Grinder Pump	
20	Pressure Lateral Valve Assembly & Curb Box	
21	Pressure Service Connection	
22	Pressure Sewer Clean-outs	
23	Pressure Sewer Air Valve Chamber	
24	Pressure Sewer Junction	to be developed
25	Pressure Sewer Connection to Existing Manhole	
26	Typical Thrust Blocks	



#### NOTES:

1. METALLIC WARNING/DETECTION TAPE:
  - A. THREE (3) INCHES WIDE METALLIC LINED.
  - B. TAPE SHALL BE GREEN IN COLOR WITH "CAUTION BURIED SEWER LINE BELOW" ON IT.
  - C. TAPE IS TO BE PLACED APPROXIMATELY 1 FT. BELOW SUBGRADE.
  - D. TAPE SHALL BE SET AT ALL MAINS AND LATERALS.
2. EARLY WARNING TAPE:
  - A. 3" WIDE POLYETHYLENE "CAUTION BURIED SEWER LINE BELOW" STENCILED EVERY TWO (2) FEET.
  - B. TAPE IS TO BE PLACED APPROX. 2 FEET ABOVE PIPE.
3. PIPE SHALL BE TESTED IN ACCORDANCE WITH SPECIFICATIONS SECTION 02551.

PIPE SIZE	BEDDING DEPTH A
4"-16"	6"
18"-48"	8"
54"-84"	10"

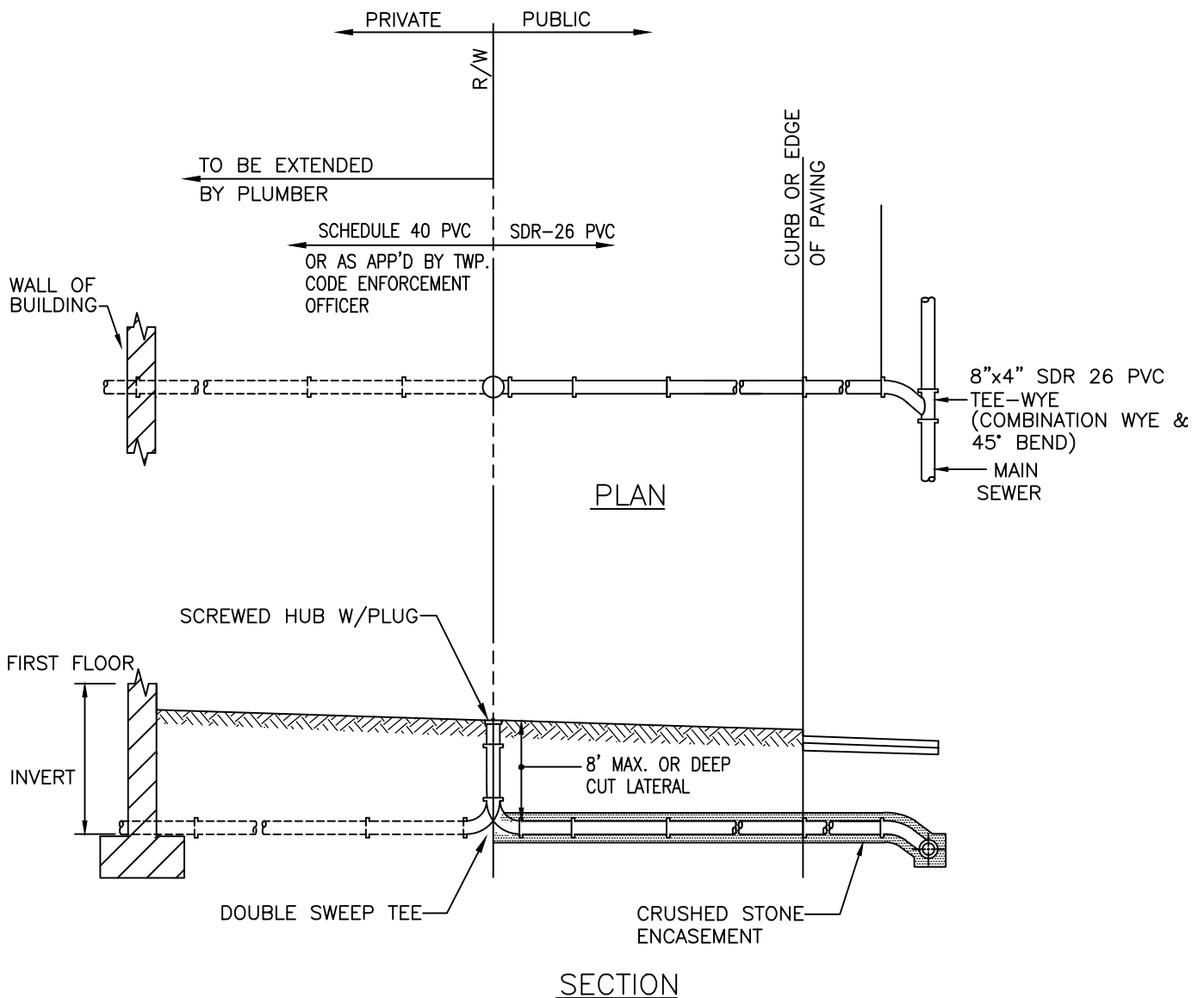


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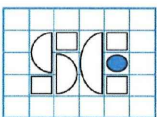
**WHITPAIN TOWNSHIP**  
 MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 1**  
**SANITARY SEWER**  
**BACKFILL**



**NOTES:**

1. MINIMUM GRADE OF LATERAL = 1/4" IN 1'-0", EXCEPT AS APPROVED OTHERWISE BY TOWNSHIP.
2. 48" MINIMUM COVER.
3. CLEANOUT TEE TO BE LOCATED:
  - Ⓞ ROAD RIGHT OF WAY
  - Ⓞ EDGE OF EASEMENT
  - Ⓞ AS APPROVED BY TWP.
4. MAXIMUM DEPTH OF CLEANOUT SHALL BE 8 FEET. IF NECESSARY, A DEEP CUT LATERAL CONNECTION TO THE SEWER MAIN MAY BE REQUIRED.

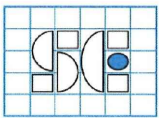
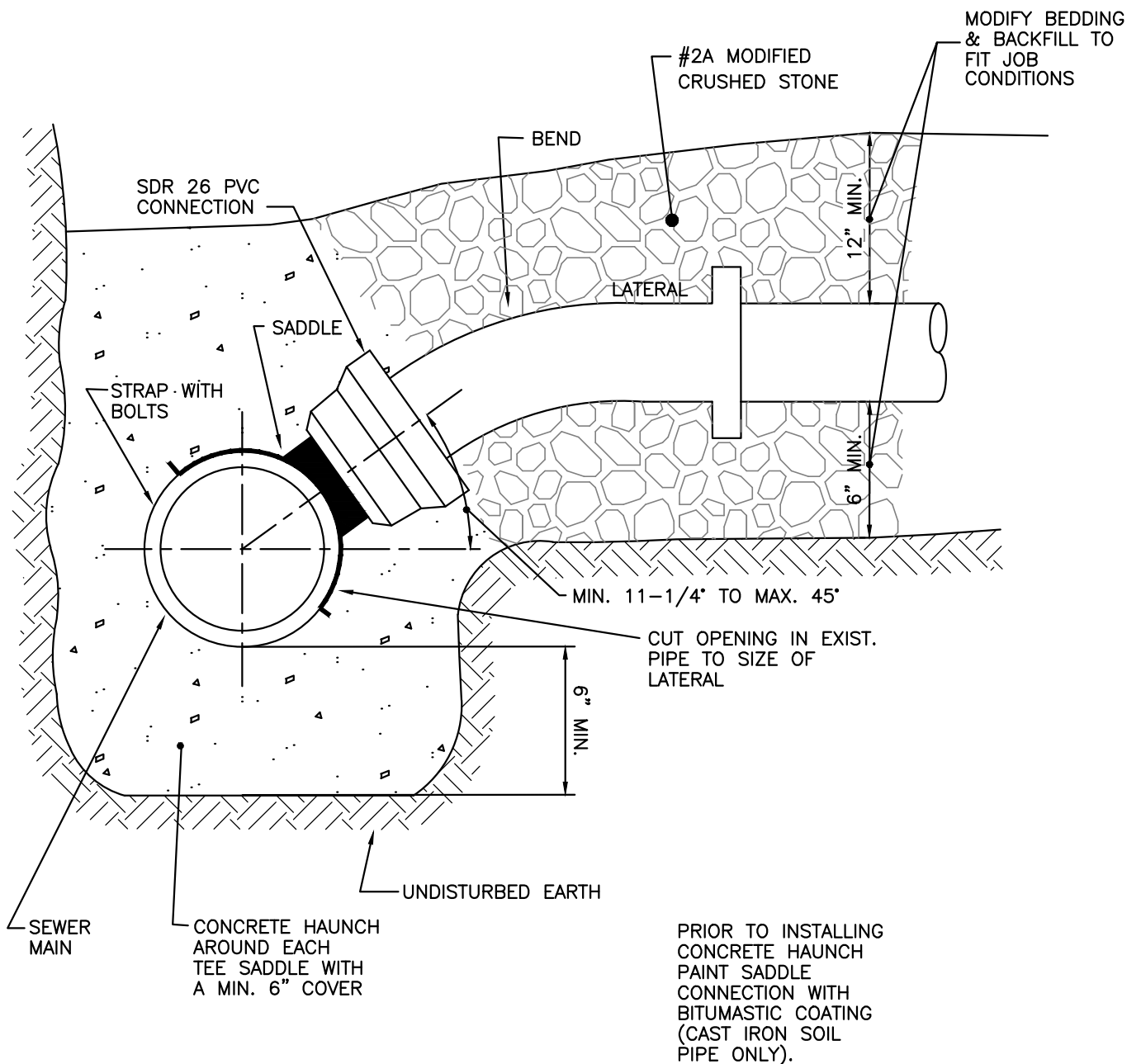


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**SANITARY SEWER SYSTEM**

**DETAIL # 2**  
**HOUSE LATERAL**

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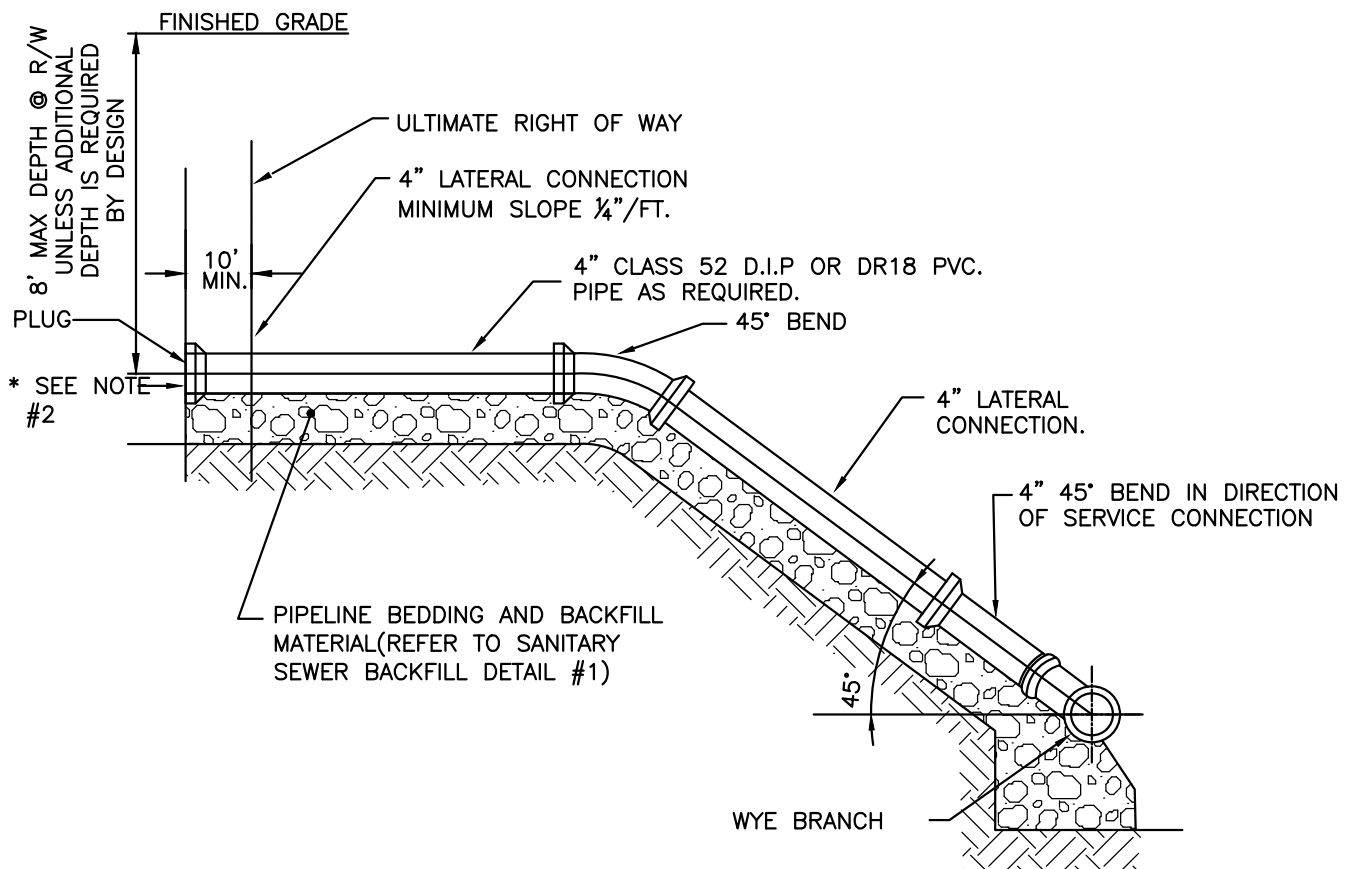


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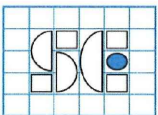
**DETAIL # 3**  
**SADDLE CONNECTION**  
**(TO EXISTING SEWER)**



### ELEVATION

#### NOTE:

1. 6" LATERAL TO BE EXTENDED 10 FT BEYOND ULT. R/W
2. SET 2"X 4" OAK STAKE TO EXTEND 48" ABOVE FINISHED GRADE. PAINT TOP OF STAKE GREEN, WITH LOT # OR EXISTING HOUSE # AS WELL AS DEPTH OF INVERT WRITTEN ON STAKE.

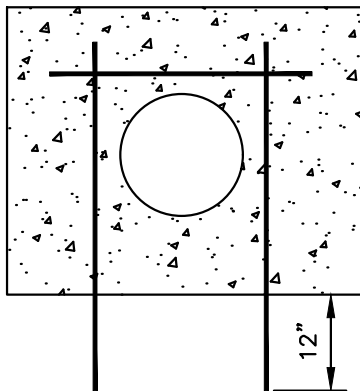
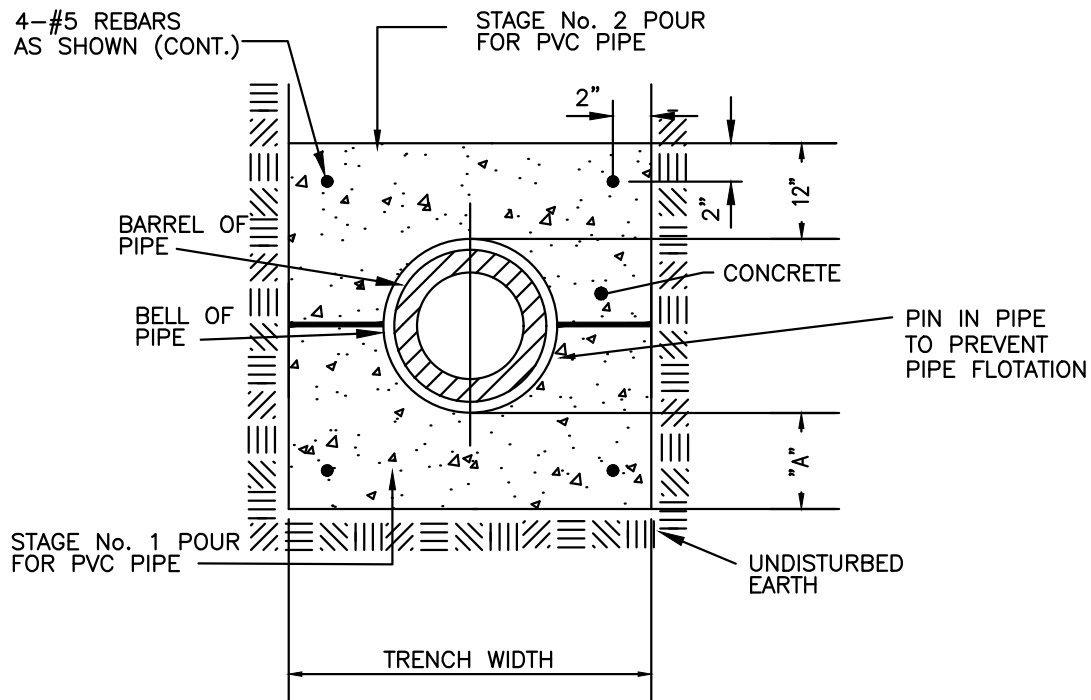


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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 4**  
**DEEP CUT LATERAL CONNECTION**



PIPE SIZE	A
4"-16"	6"
18"-48"	8"
54"-84"	10"

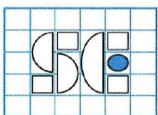
#### METHOD OF ENCASING P.V.C. PIPE IN CONCRETE

STAGE No. 1—INSTALL CONCRETE FROM BOTTOM OF TRENCH TO CENTERLINE OF PIPE.

STAGE No. 2—AFTER 24 HOUR PERIOD INSTALL CONCRETE FROM CENTERLINE OF PIPE TO 12" ABOVE BARREL OF PIPE.

#### PIPE PINNING NOTES

1. PIN PIPE TO PREVENT PIPE FROM FLOATATION.
2. #5 REBAR SHALL BE EXTENDED VERTICALLY 12" INTO UNDISTURBED EARTH ON EITHER SIDE OF THE PIPE AT 2 FEET SPACING.
3. #5 REBAR SHALL BE PLACED HORIZONTALLY ABOVE THE PIPE AND JOINED TO THE VERTICAL REBAR WITH TIE WIRE.



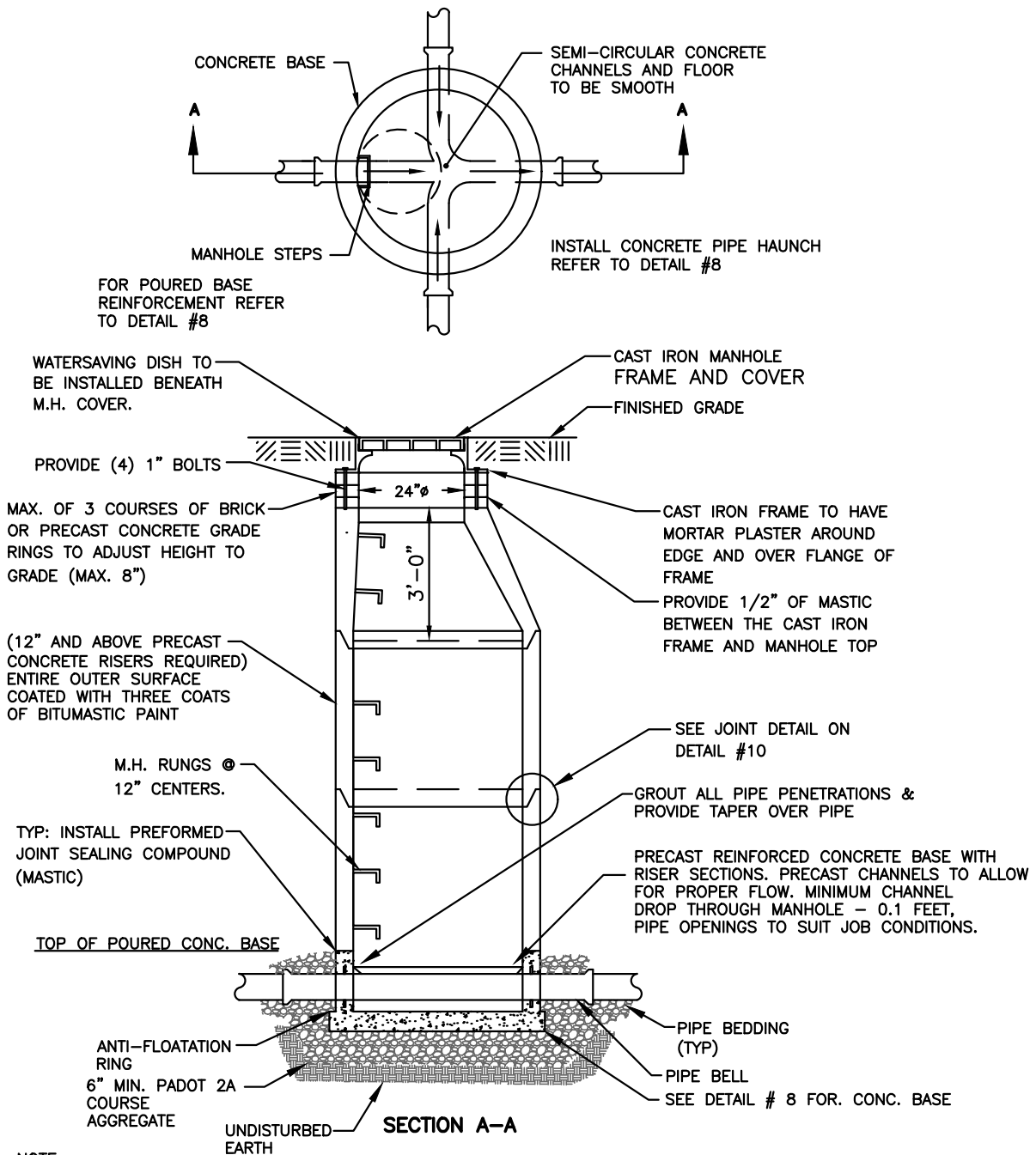
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

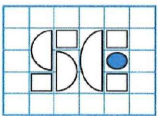
**DETAIL #5**  
**CONCRETE**  
**ENCASEMENT**





**NOTE**

1. STEEL TEMPLATE TO BE SUPPLIED BY MANHOLE MFR. IN ORDER TO FORM PROPER RECESS IN CONCRETE.
2. RISER TO BE MULTIPLE LENGTHS OF 1'-0", IN ORDER TO SUIT VARIATIONS IN ELEVATION.
3. CONSTRUCT IN ACCORDANCE WITH PENNDOT PUBLICATION 408 CURRENT EDITION SECTION 714; AND ASTM C-478M-90. STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS AS MODIFIED HEREIN.
4. MINIMUM CONCRETE COMPRESSIVE STRENGTH:  
CAST IN PLACE 4000 PSI  
PRECAST 4000 PSI
5. PROVIDE STEEL REINFORCEMENT IN ACCORDANCE WITH ASTM A-185.
6. MANHOLE COATINGS: EXTERIOR COATING; COOPER BLACK NO. 760 TOP SERVICE BLACK AS MANUFACTURED BY COOPERS CREEK CHEMICAL CORP. OR APPROVED EQUAL. AT LEAST THREE (3) COATS SHALL BE APPLIED GIVING A TOTAL DRY FILM THICKNESS OF A MINIMUM 32.0 MILS. INTERIOR COATING: SHERWIN WILLIAMS MACRO POXY 646 WHITE. AT LEAST TWO (2) COATS SHALL BE APPLIED GIVING A TOTAL DRY THICKNESS OF A MINIMUM 12-14 MILS.
7. MANHOLES SHALL BE CONSTRUCTED WITH STEPS. REFER TO WHITPAIN TOWNSHIP DETAIL #15 FOR SPEC. OF STEPS.
8. MANHOLES SHALL BE TESTED AFTER FINAL WEARING COURSE INSTALLATION IN ACCORDANCE WITH SPECIFICATIONS SECTION 02560.



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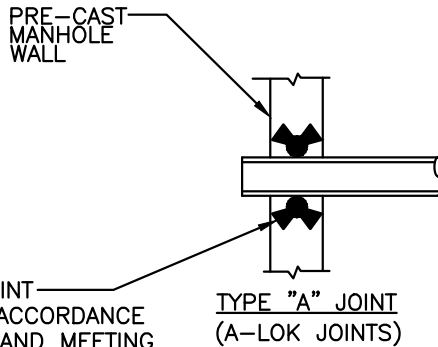
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 7**  
**PRECAST SANITARY**  
**MANHOLE**

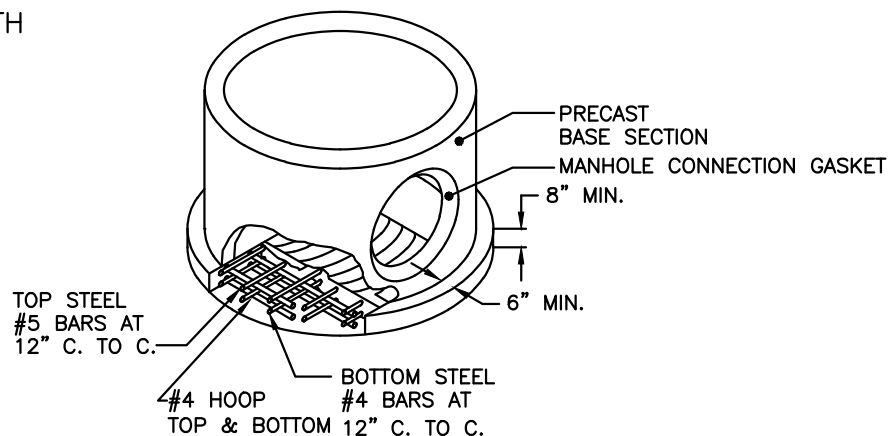
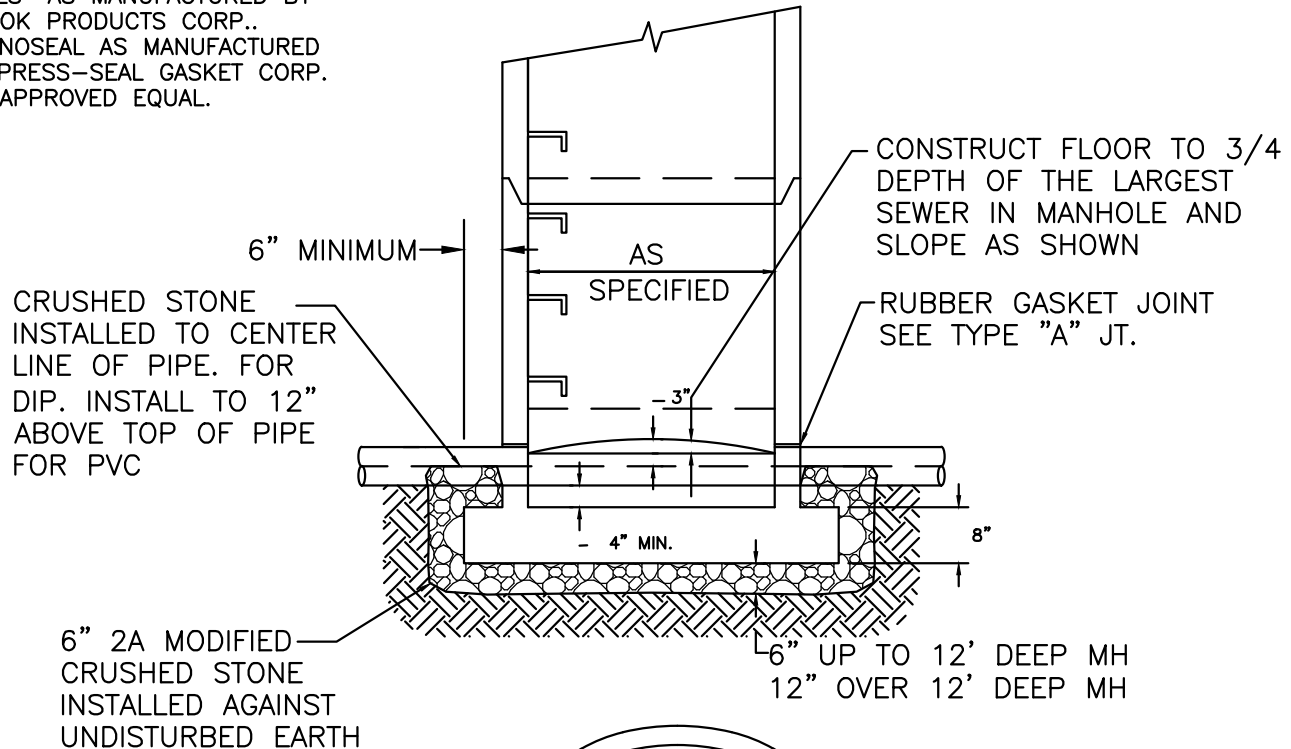




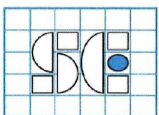
RUBBER GASKET JOINT MANUFACTURED IN ACCORDANCE WITH ASTM C-443 AND MEETING PERFORMANCE AND TEXT REQ. OF ASTM C-425 JOINTS SHALL BE "A-LOK FULL COMPRESSION SEALS" AS MANUFACTURED BY A-LOK PRODUCTS CORP.. ECONOSEAL AS MANUFACTURED BY PRESS-SEAL GASKET CORP. AN APPROVED EQUAL.

#### NOTES:

- 1) CONSTRUCT IN ACCORDANCE WITH PENNDOT PUBLICATION 408 CURRENT EDITION SECTION 714. AND ASTM C-478M-90. AND PENNDOT RC STANDARDS CURRENT EDITION.
- 2) MINIMUM STRENGTH OF CONCRETE  
CAST-IN-PLACE 4000 PSI(MIN.)  
PRECAST 4000 PSI(MIN.)
- 3) PROVIDE STEEL REINFORCEMENT MEETING THE REQUIREMENTS OF PENNDOT PUBLICATION 408 CURRENT EDITION SEC. 709. REINFORCE PER PENNDOT 408 CURRENT EDITION AND RC STANDARD RC-39M SHEETS 1 THROUGH 5.
- 4) FLOW CHANNEL TO BE PRECAST INTO MANHOLE BASE.
- 5) MANHOLE CONNECTION SHALL BE A-LOK OR PRESS-SEAL ECONOSEAL PER ASTM C-923.



REBAR DETAIL

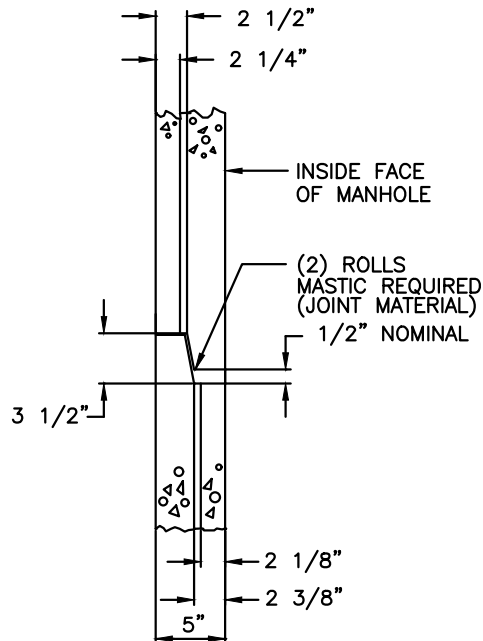
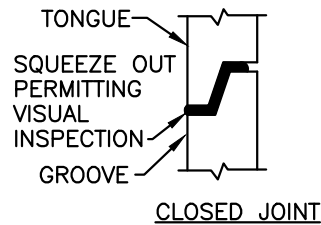
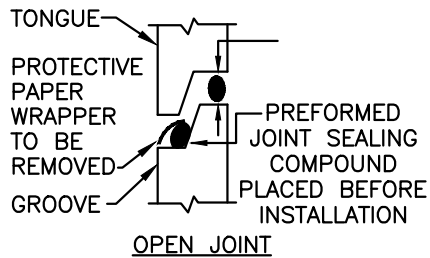


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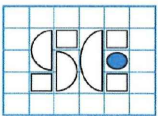
**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 8**  
**PRECAST MANHOLE**  
**BASE**



WALL SECTION

PIPE	MANHOLE I.D.	WALL THICKNESS
8"-15"	4 FT	5"
18"-24"	5 FT	6"
27"-36"	6 FT	7"

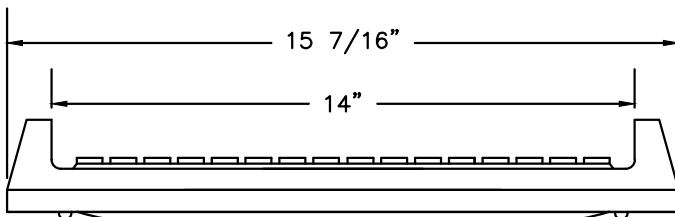
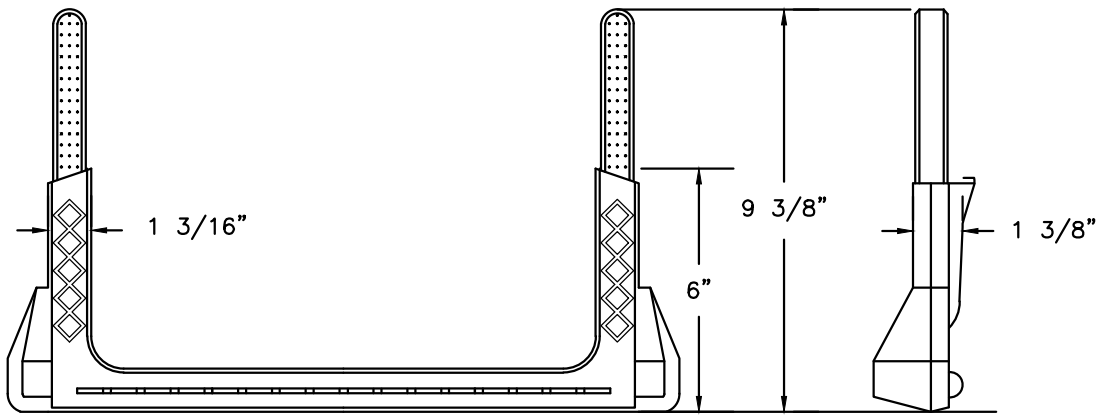


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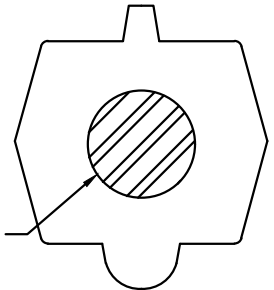
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 9**  
**PRE-CAST MANHOLE**  
**WALLS & JOINTS**

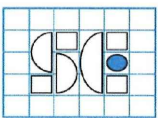


1/2" GRADE 60  
STEEL REINFORCEMENT



**NOTES:**

1. MANHOLE STEP SHALL CONFORM TO ASTM C-478.
2. MANHOLE STEPS ARE TO BE MADE OF COPOLYMER POLYPROPYLENE, CONFORMING TO ASTM D-4141-95B PP0344B3353Z202.
3. THE STEEL TO BE USED IN MANUFACTURING OF THIS PRODUCT TO BE DEFORMED 1/2" REINFORCING ROD. THIS MATERIAL TO BE GRADE 60 AND CONFORM TO ALL THE REQUIREMENTS OF ASTM A-615.
4. MANHOLE STEPS SHALL BE TYPE PS2-B. AS MANUFACTURED BY M.A. INDUSTRIES OR APPROVED EQUAL.



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MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 10**  
**MANHOLE STEPS**

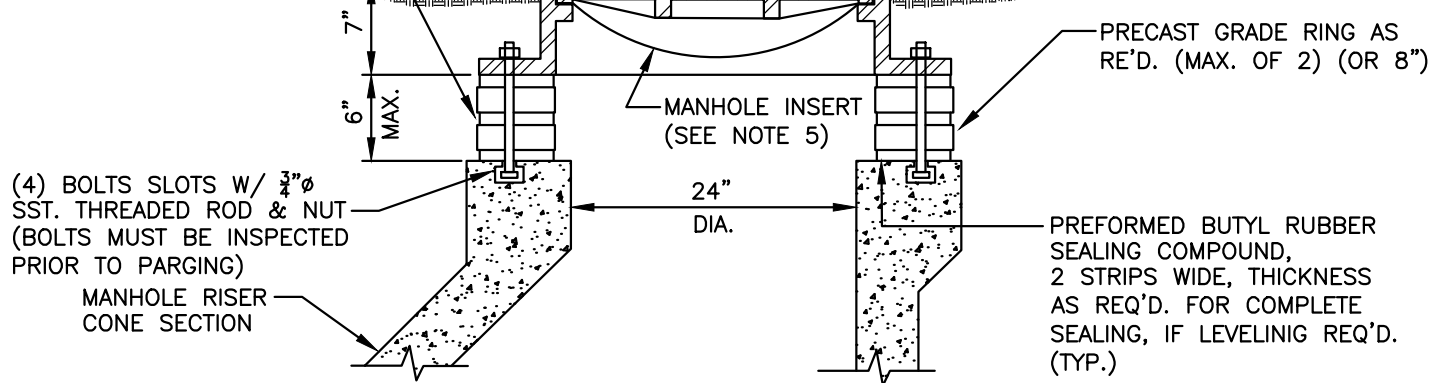
**NOTES:**

1. ANCHOR BOLT HOLES SHALL BE DRILLED WITH A PERCUSSION OR ROTARY HAMMER DRILL UTILIZING A CARBIDE DRILL BIT. CORE DRILLING, OR ROTATIONAL ONLY DRILLING OF ANY KIND IS NOT ALLOWED.

2. FRAME ANCHORS SHALL BE TIGHTENED PRIOR TO CURING OF NON-SHRINK GROUT.

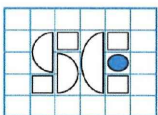
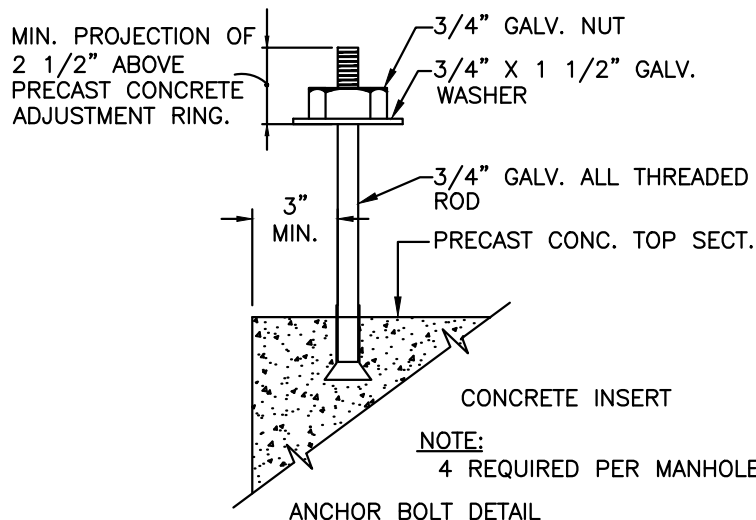
NON-SHRINK GROUT APPLY PRIOR TO PLACING GRADE RINGS & FRAME, TROWEL EDGE (TYP.)

FRAME AND COVER (COVER TO BE FLUSH AFTER INSERT PLACED)



**NOTES:**

1. MANHOLE INSERT NOT REQUIRED FOR WATERTIGHT MANHOLE FRAME & COVER.
2. FRAME & COVER SHALL BE DESIGNED FOR AASHTO HS-25 LOADING.
3. MANHOLE INSERTS REQUIRED FOR ALL STANDARD FRAMES & COVERS. FRAMES SHALL BE SPECIALLY MACHINED TO ACCOMMODATE INSERT SO THAT TOP OF COVER IS EVEN WITH TOP OF FRAME WHEN INSERT IS INSTALLED.
4. WATERSAVING DISH TO BE INSTALLED BENEATH MANHOLE COVER.
5. INSTALL MANHOLE ENCAPSULATION SYSTEM. EXTEND 3"-4" MINIMUM ONTO MANHOLE FRAME AND CONE SECTION COVERING JOINTS ON MANHOLE GRADE ADJUSTMENT RINGS. MANUFACTURED BY CANUSA-CPS.



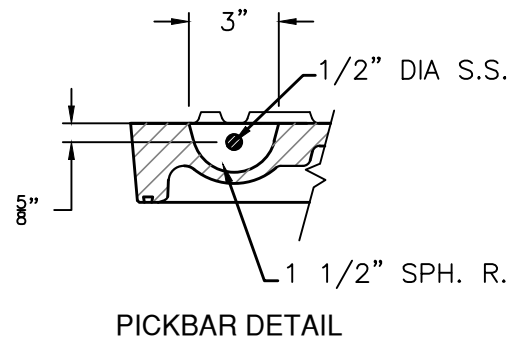
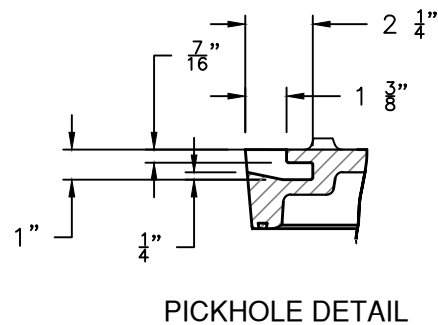
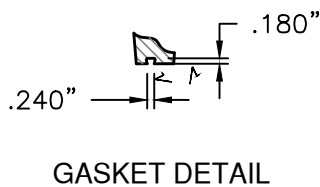
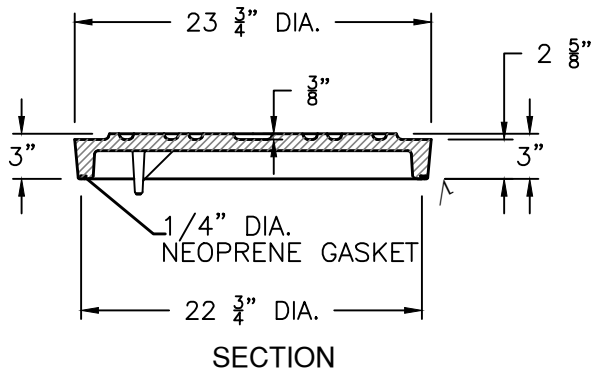
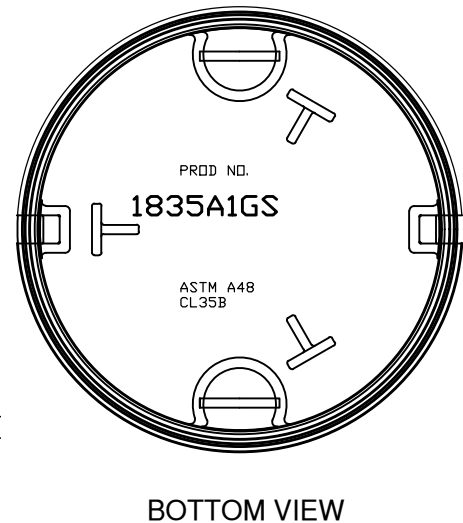
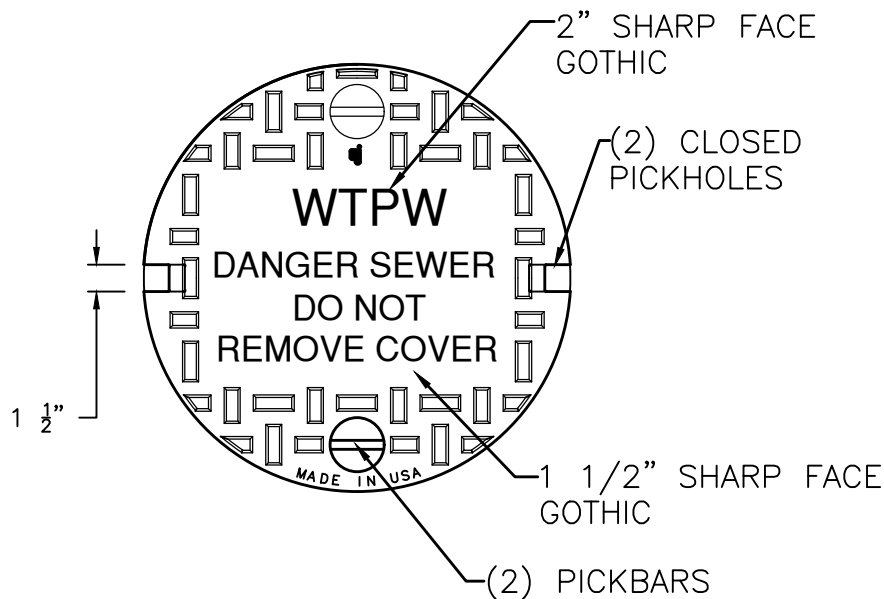
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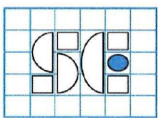
**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 11**  
**PRECAST MANHOLE**  
**TOP SECTION**





STANDARD MANHOLE COVERS  
SHALL BE EAST JORDAN IRON  
WORKS: CATALOG 1835A1GS,  
PRODUCT NUMBER 00183549,  
OR APPROVED EQUAL

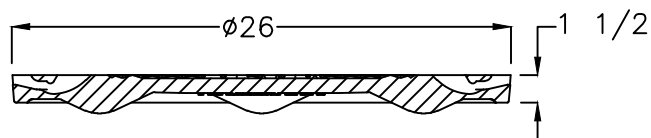
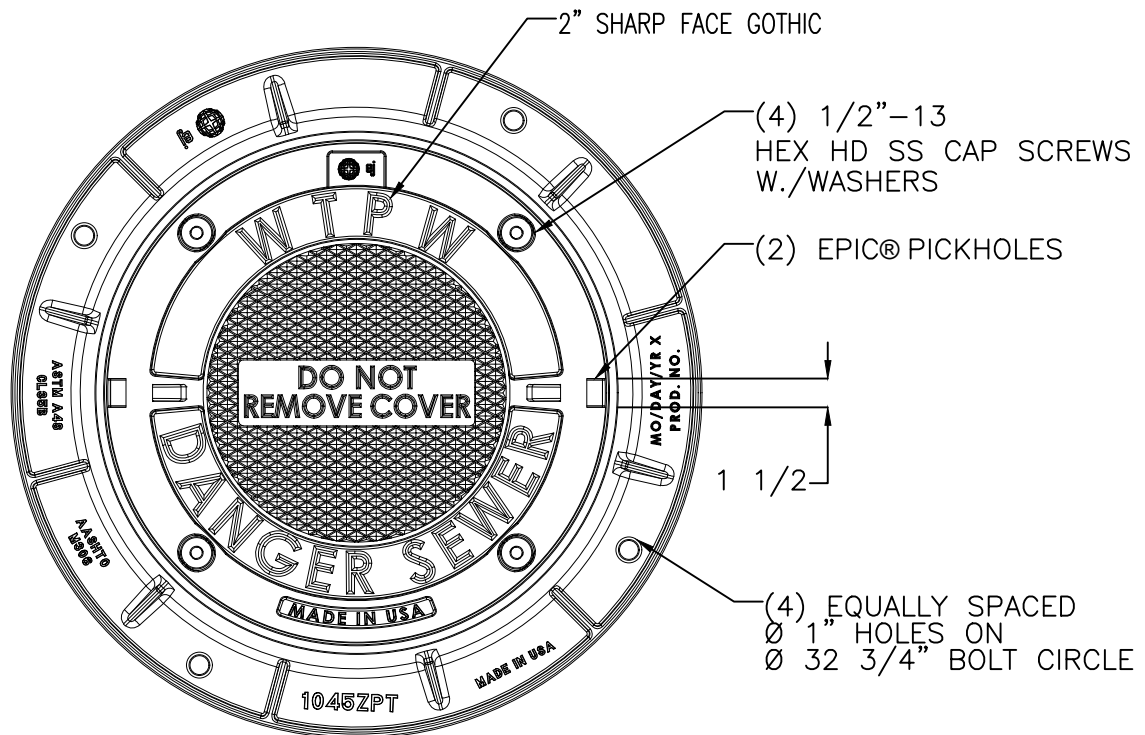


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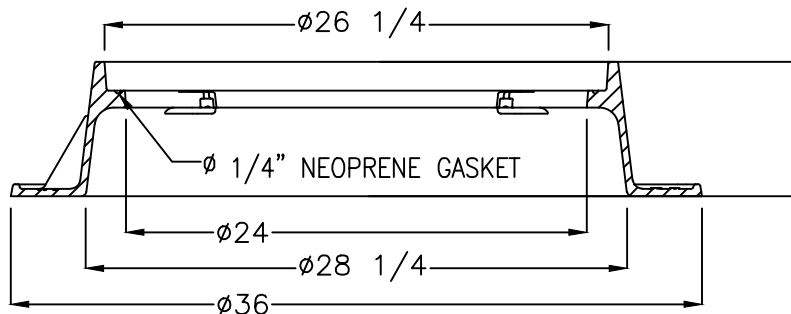
ORIGINATION DATE	2-26-21
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 13**  
**STANDARD**  
**MANHOLE COVER**

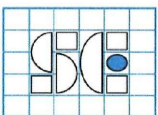


COVER SECTION



FRAME SECTION

WATERTIGHT MANHOLE FRAME AND COVER  
ASSEMBLIES SHALL BE EAST JORDAN IRON  
WORKS: CATALOG 1040APT/1045ZPT,  
PRODUCT NUMBER 00104637, OR  
APPROVED EQUAL



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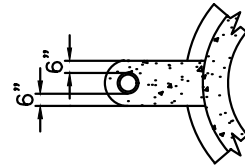
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MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

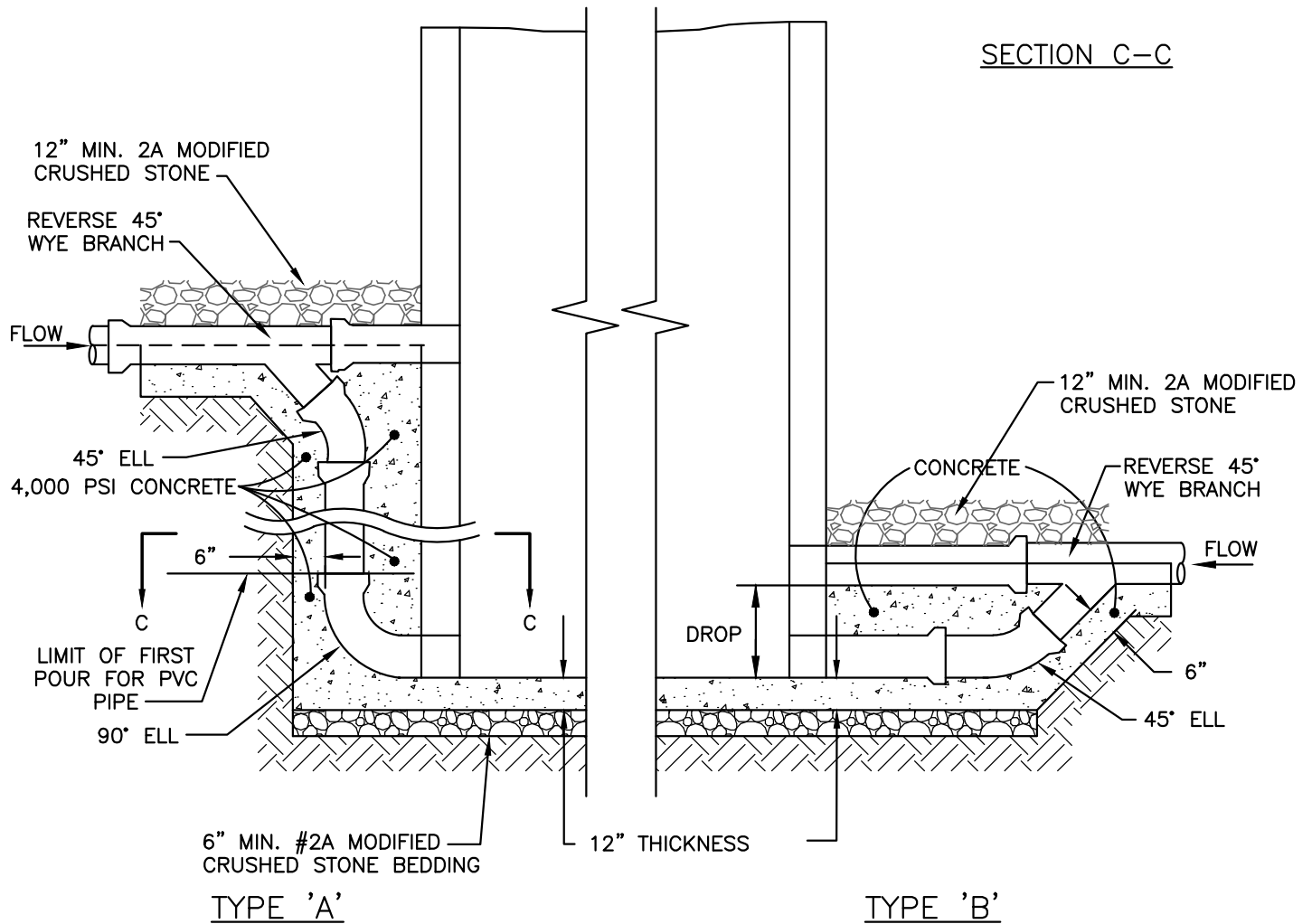
**DETAIL # 14**  
**WATERTIGHT MANHOLE**  
**FRAME & COVER**

**NOTES:**

- 1) IN LIEU OF BELLS, PROVIDE MECH. JOINTS FOR DROP ASSEMBLY WHERE D.I. PIPE IS SPECIFIED.
- 2) FOR POURED BASE REINFORCEMENT REFER TO DETAIL #8.



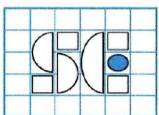
SECTION C-C



OPTION: ATLANTIC CONCRETE PRE-CAST DROP ASSEMBLIES MAY BE USED.

TYPE B DROP  
MINIMUM DROP

8" SEWER	15.5"
10" SEWER	18.2"
12" SEWER	22"
15" SEWER	25.2"



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**SANITARY SEWER SYSTEM**

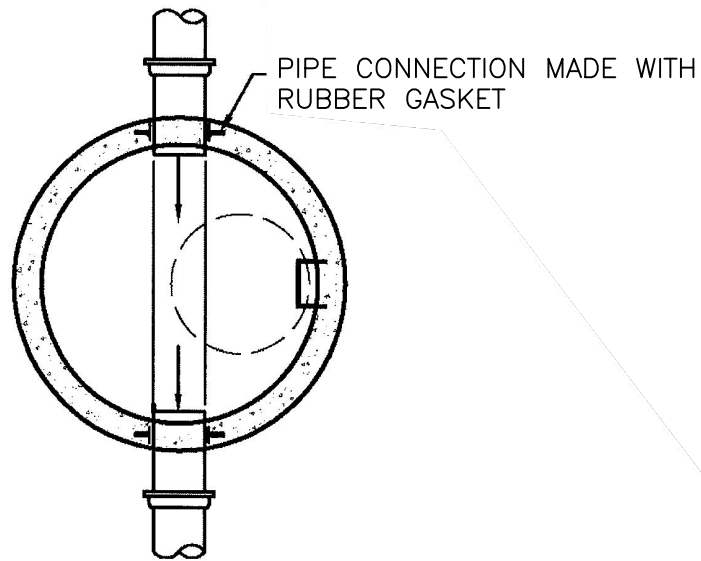
**DETAIL # 15**  
**DROP MANHOLE**

ORIGINATION DATE	2-26-21
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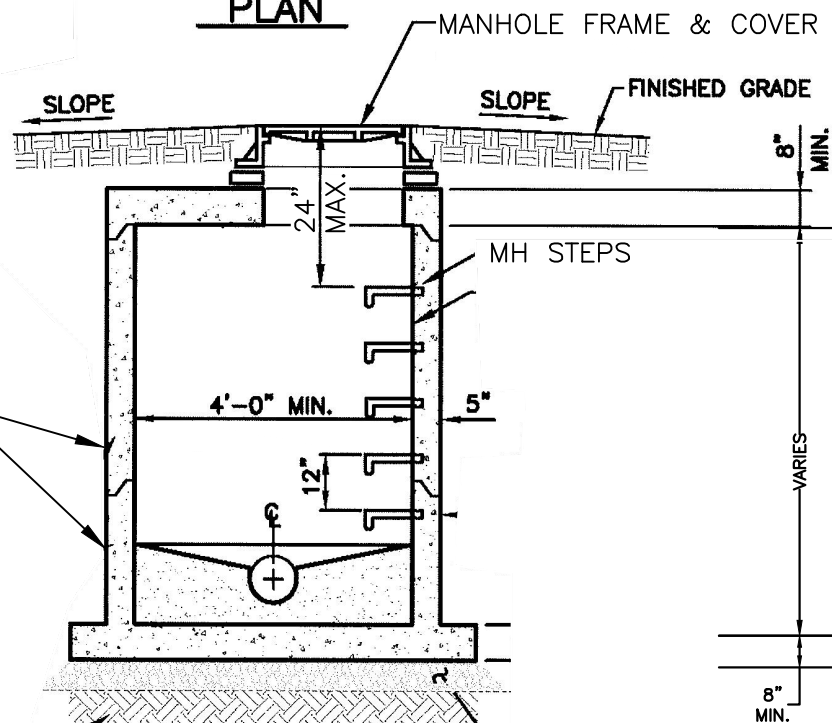


**NOTES:**

1. THIS STRUCTURE SHALL BE USED FOR ALL SHALLOW GRAVITY SANITARY SEWER MANHOLES LESS THAN 5 FEET DEEP.
2. ALL OTHER REQUIREMENTS FOR PRECAST MANHOLE, AS SPECIFIED ON OTHER DETAILS, SHALL APPLY.



**PLAN**

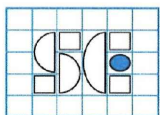


**SECTION**

PRECAST REINFORCED CONCRETE BASE WITH RISER SECTIONS. PRECAST CHANNELS TO ALLOW FOR PROPER FLOW. MINIMUM CHANNEL DROP THROUGH MANHOLE - 0.1 FEET. PIPE OPENINGS CAST TO SUIT JOB CONDITIONS.

UNDISTURBED EARTH

6" MIN. PADOT 2A MODIFIED COURSE AGGREGATE



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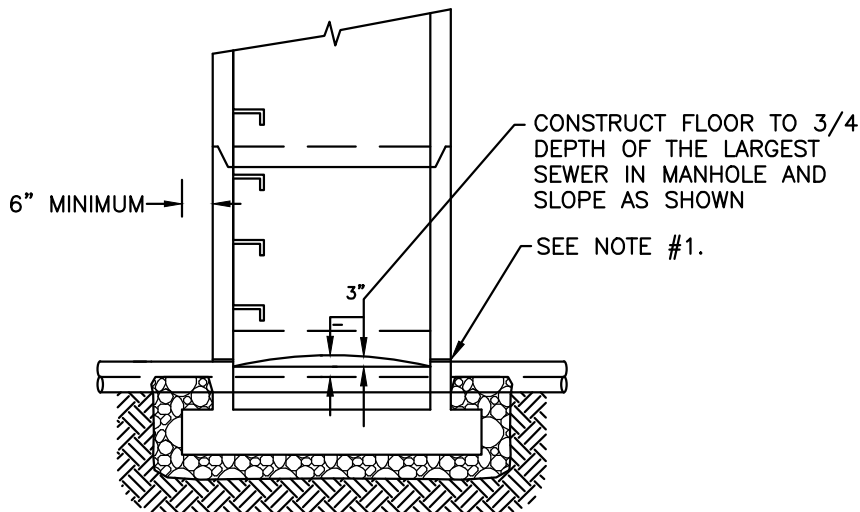
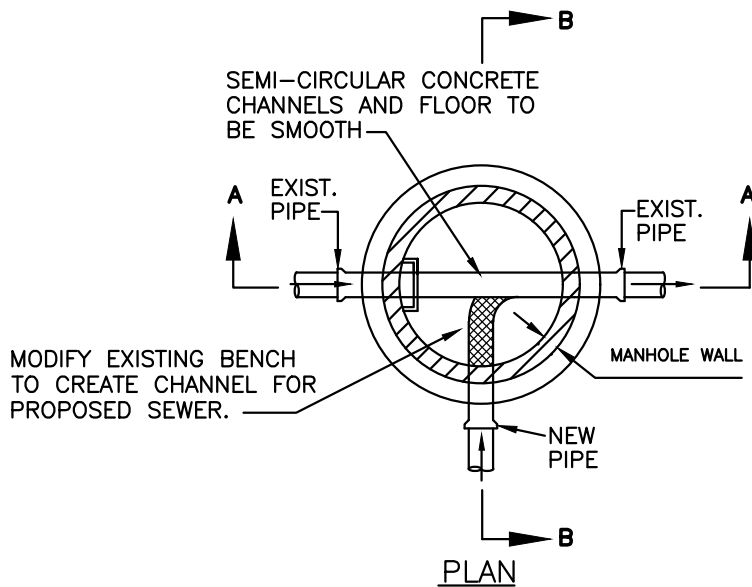
ORIGINATION DATE	2-26-21
LAST REVISION DATE	

**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

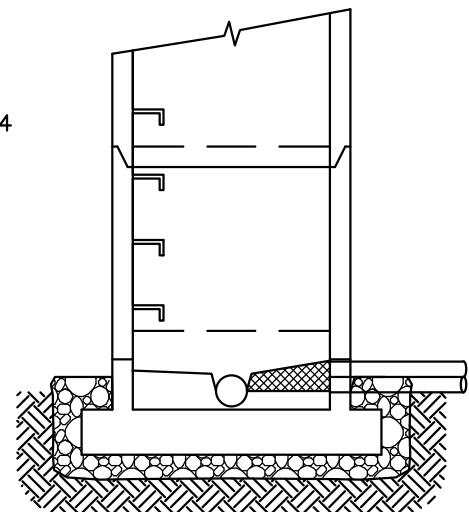
**DETAIL # 16**

**SHALLOW MANHOLE**

NOT TO SCALE



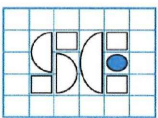
SECTION A-A



SECTION B-B

**NOTES:**

- 1) CORE DRILL HOLE INTO EXISTING MANHOLE WALL.
- 2) PIPE CONNECTION SHALL BE LINK-SEAL, OR FOR PVC PIPE, THE CONNECTION SHALL BE SEALED WITH PRESS-SEAL *PSX*: POSITIVE SEAL OR TRELLEBORG *KOR-N-SEAL*
- 3) RESHAPE AND OR RECONSTRUCT EXISTING CHANNEL FOR NEW FLOW PATTERN.

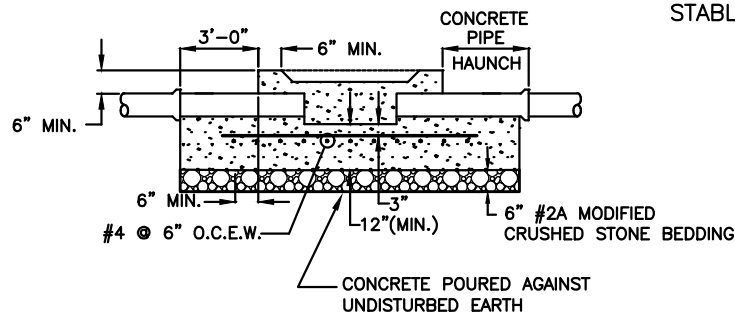
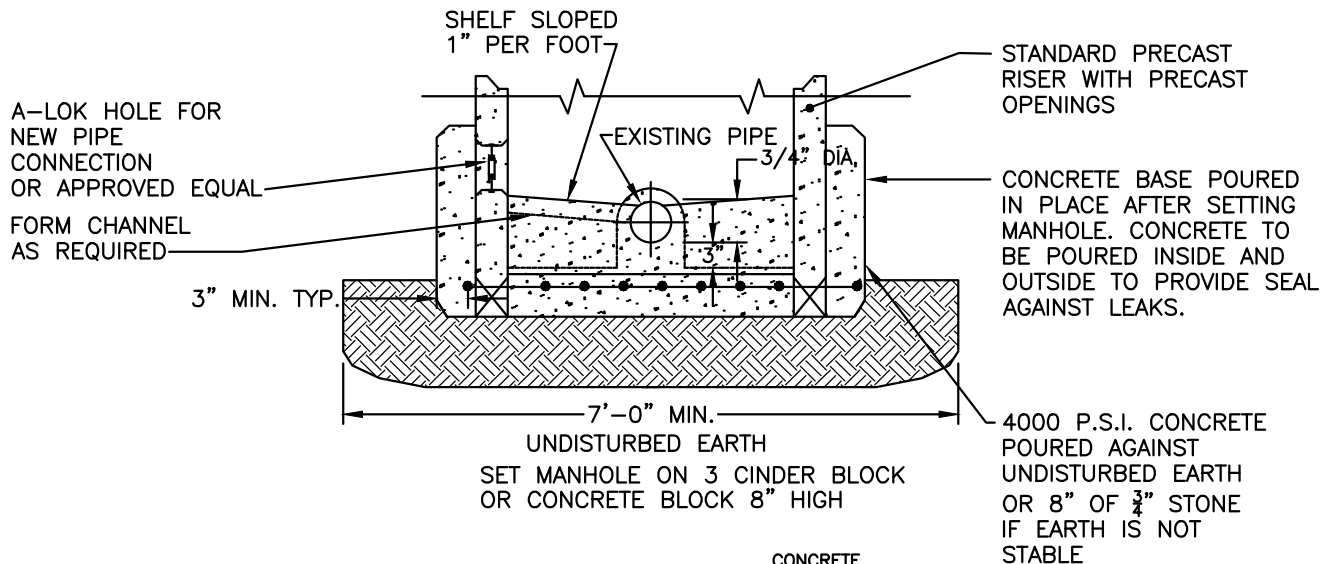
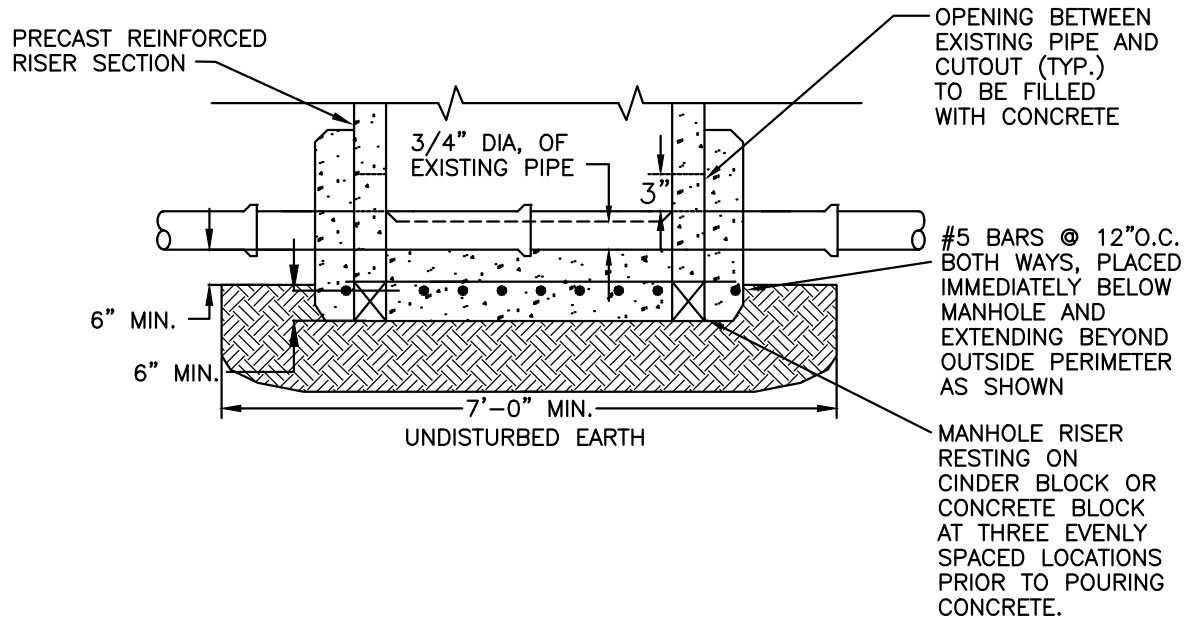


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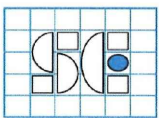
**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 17**  
**CONNECTION TO**  
**EXISTING MANHOLE**



**NOTE:**

1. EXISTING PIPE TO REMAIN UNTIL SATISFACTORY COMPLETION OF MANHOLE TESTING
2. REMOVE CROWN OF EXISTING PIPE FLUSH WITH CONCRETE SHELF.



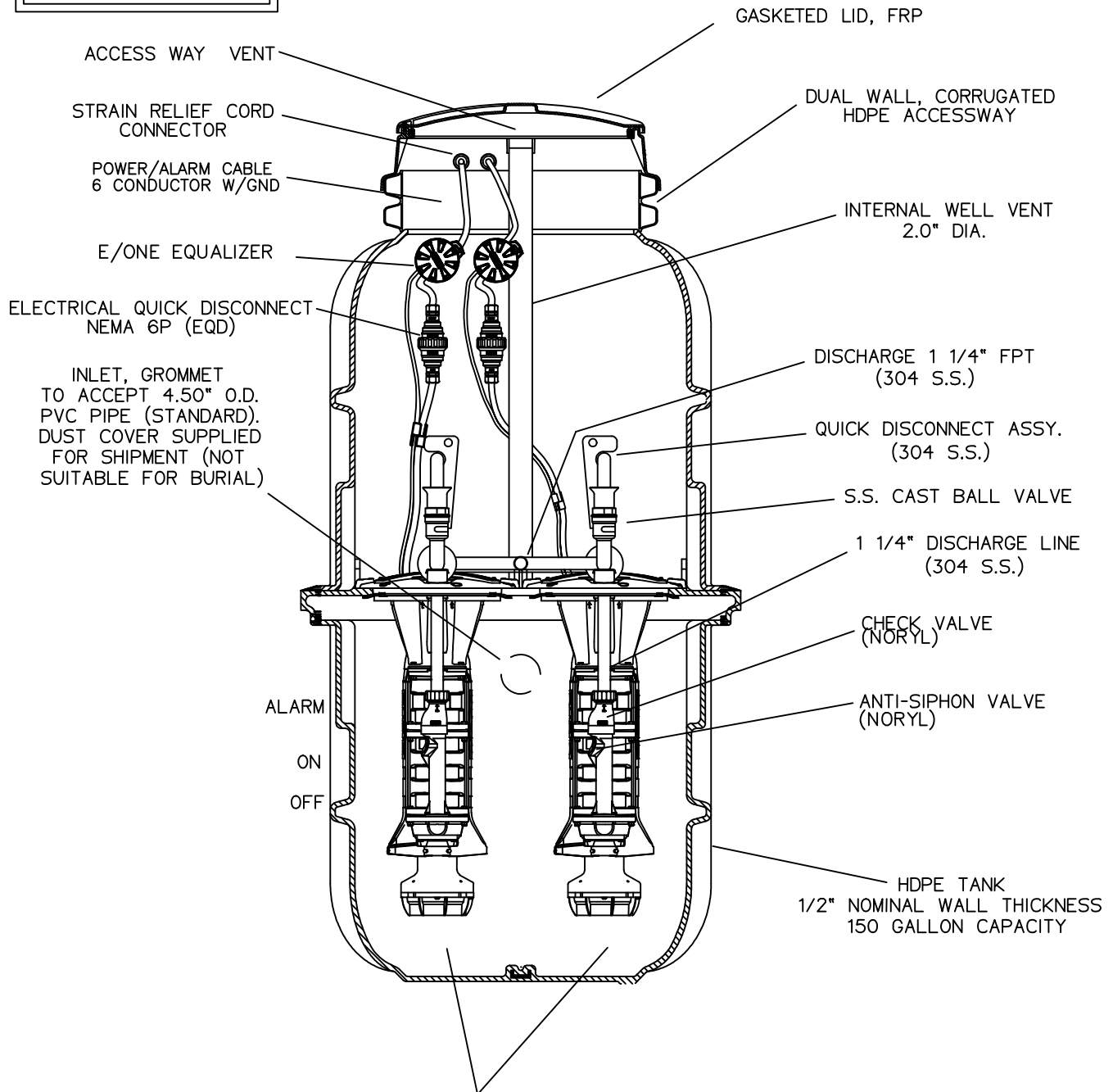
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 18**  
**DOGHOUSE**  
**MANHOLE**

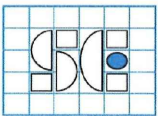
FIELD JOINT REQUIRED  
FOR MODELS  
DH152-129 / DR152-129  
&  
DH152-160 / DR152-160



SEMI-POSITIVE DISPLACEMENT TYPE PUMP  
EACH DIRECTLY DRIVEN BY A 1 HP MOTOR

CONCRETE BALLAST MAY BE REQUIRED  
SEE INSTALLATION INSTRUCTIONS  
FOR DETAILS

GRINDER PUMPS  
SHALL BE E-ONE MODEL DH-152.

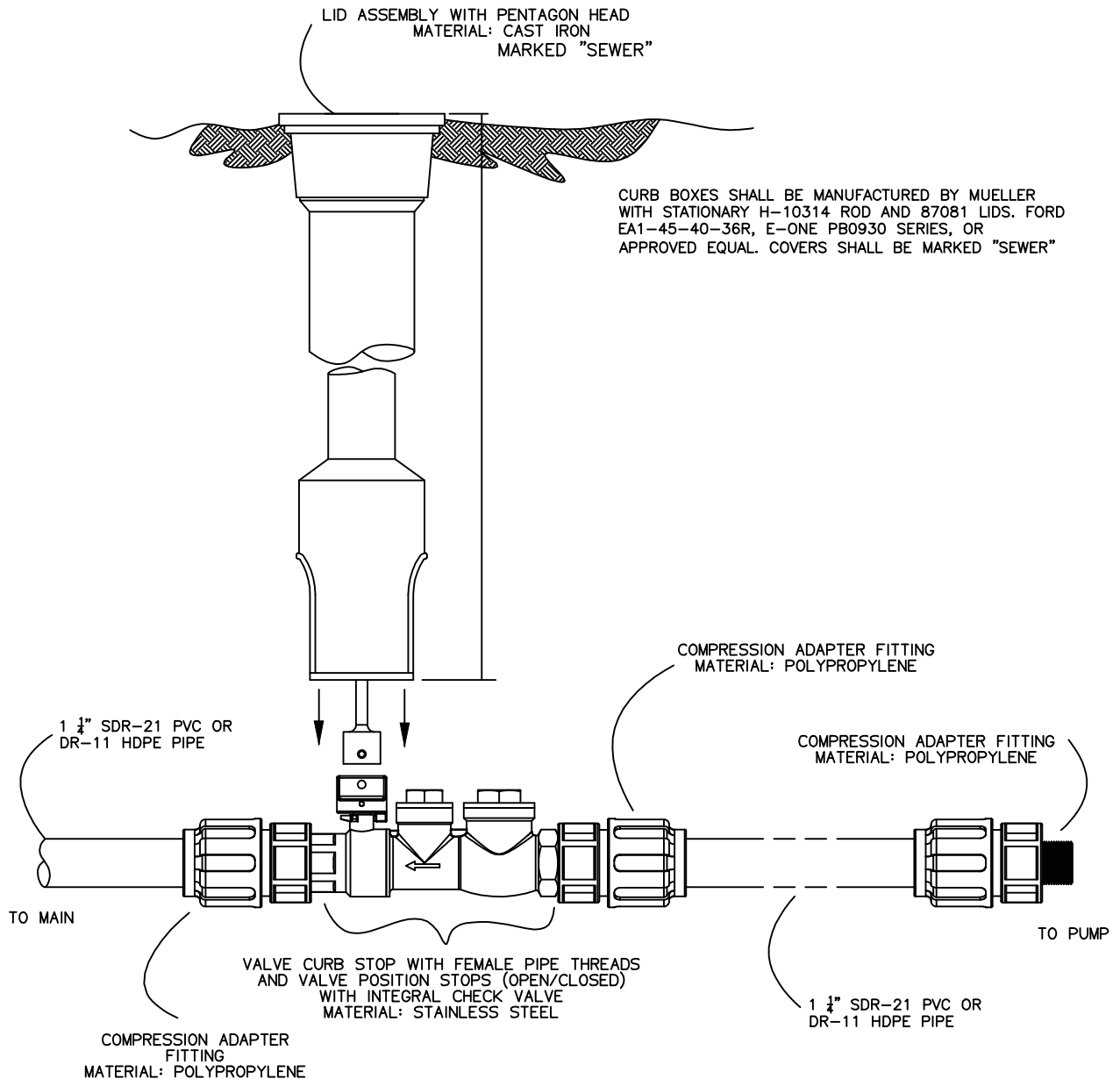


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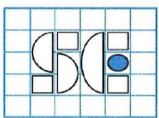
**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 19**  
**GRINDER PUMP**



NOTES:

1. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS  
\*FOR SS FITTING INTO SS THREAD, USE PIPE DOPE OR TEFLON TAPE, NOT BOTH
2. ASSEMBLY IS TO BE PRESSURE TESTED
3. ASSEMBLY IS TO BE USED WITH DR-11 HDPE PIPE OR SDR-21 PVC PIPE
4. LATERAL VALVE ASSEMBLY SHALL BE E-ONE #NCO193G01.
5. CURB BOX IS PROVIDED SEPARATELY.

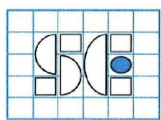
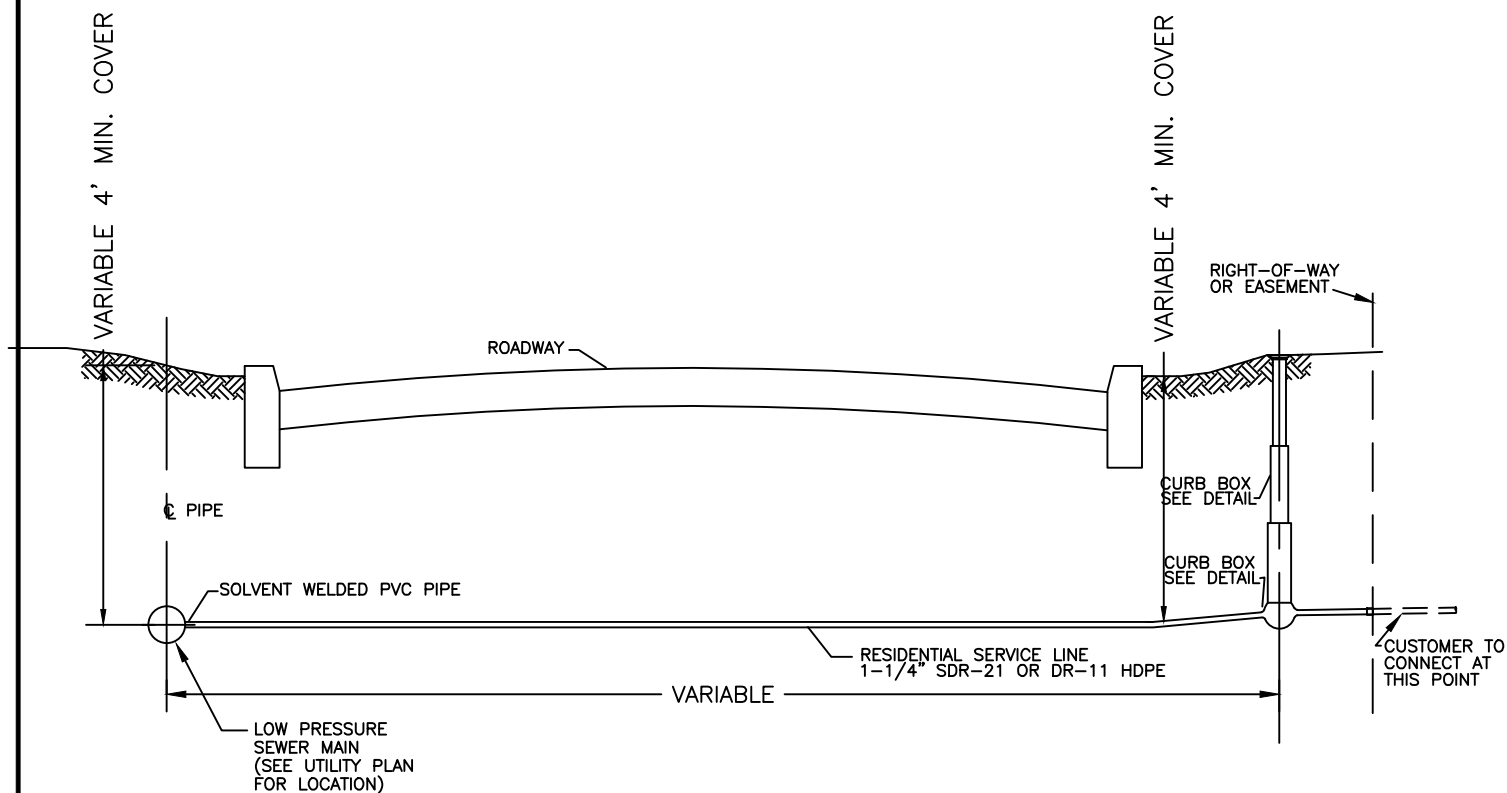


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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 20**  
**PRESSURE LATERAL**  
**VALVE ASSEMBLY**  
**& CURB BOX**

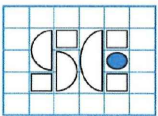
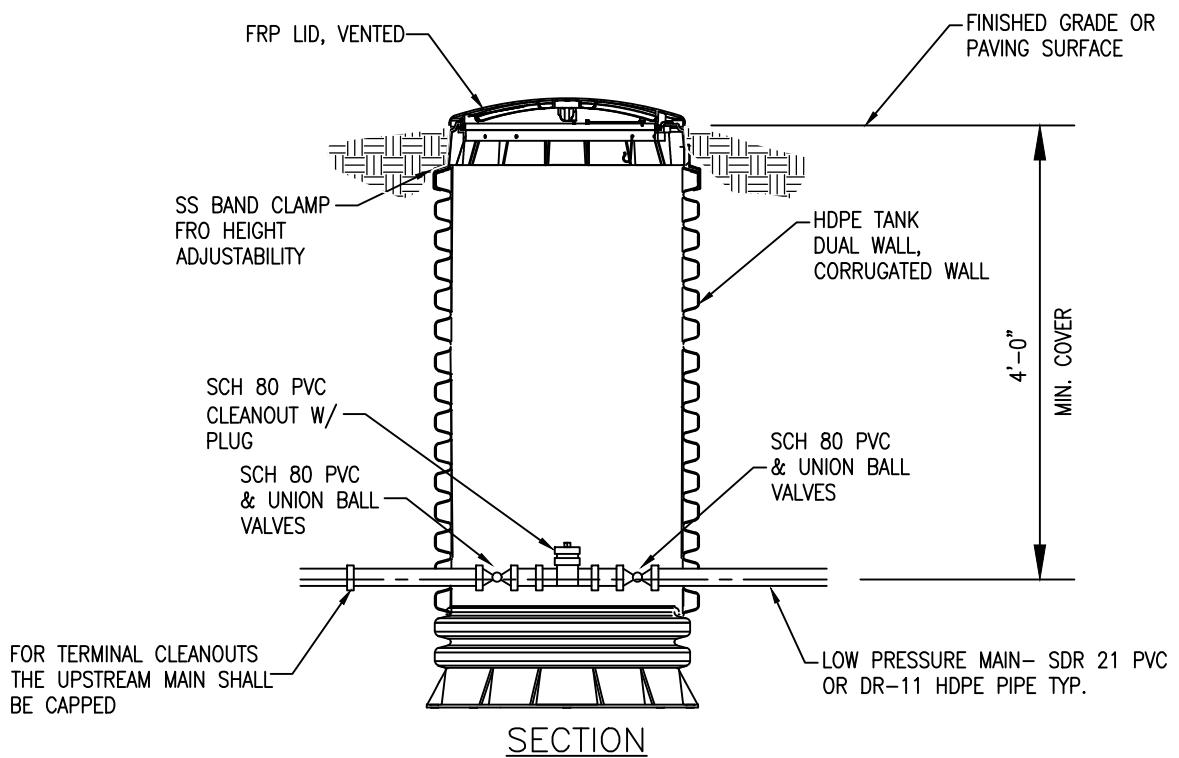
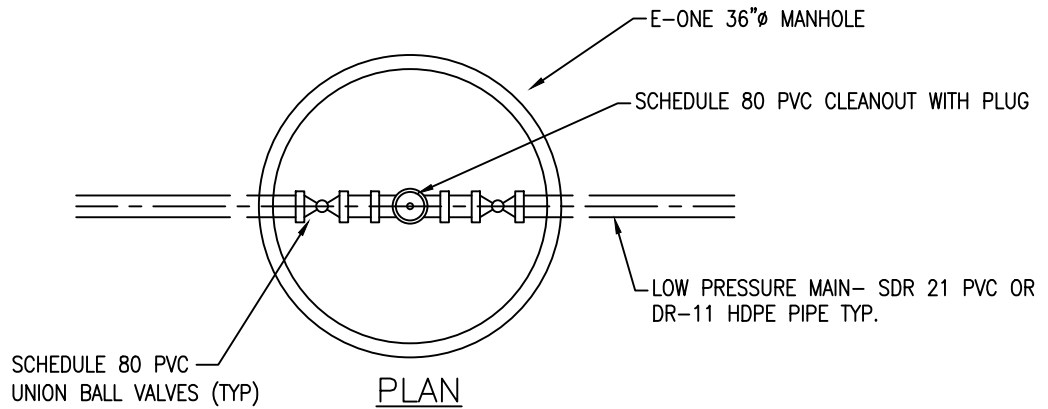


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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 21**  
**PRESSURE SERVICE**  
**CONNECTION**

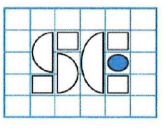
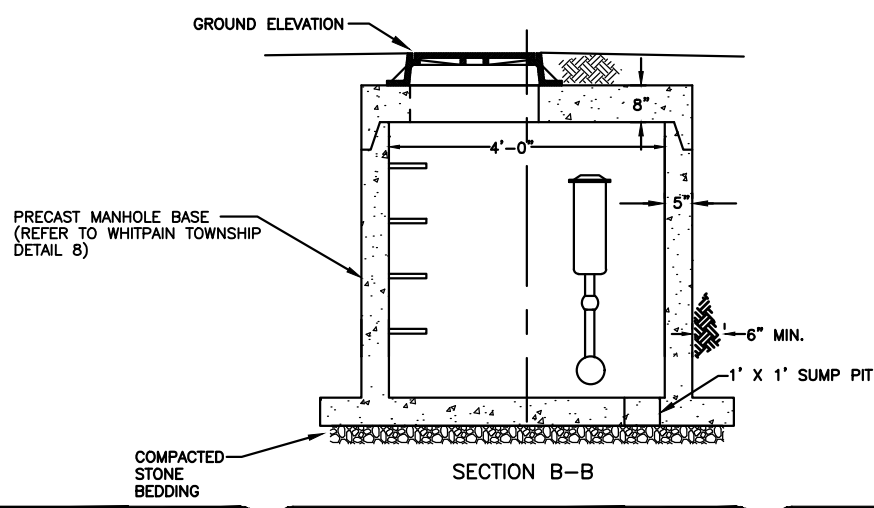
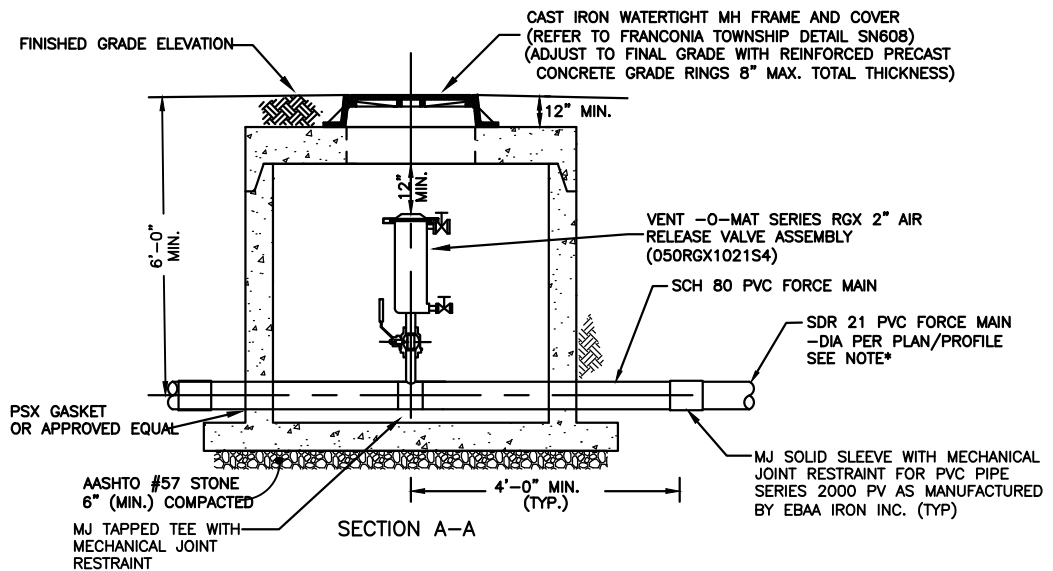
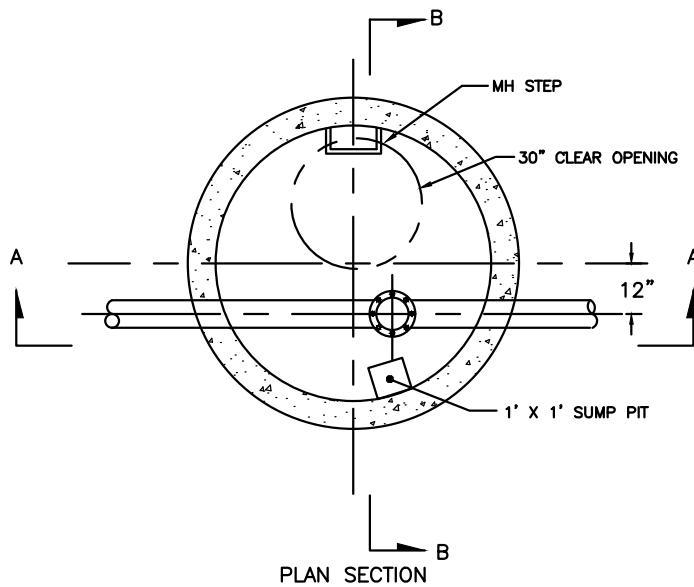


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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 22**  
**PRESSURE SEWER**  
**CLEANOUT**



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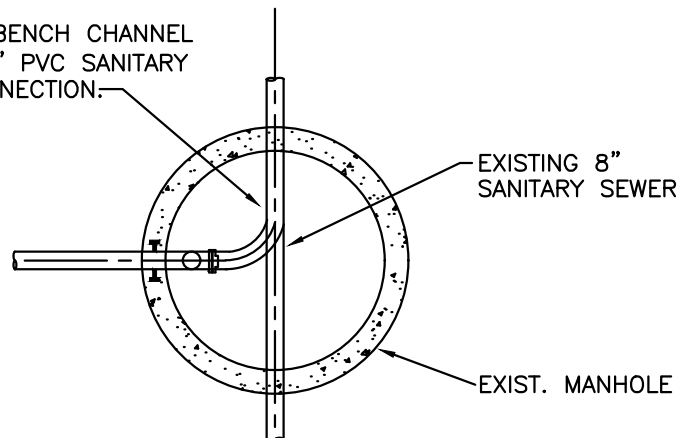
ORIGINATION DATE	2-26-21
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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 23**  
**PRESSURE SEWER**  
**AIR VALVE CHAMBER**



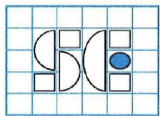
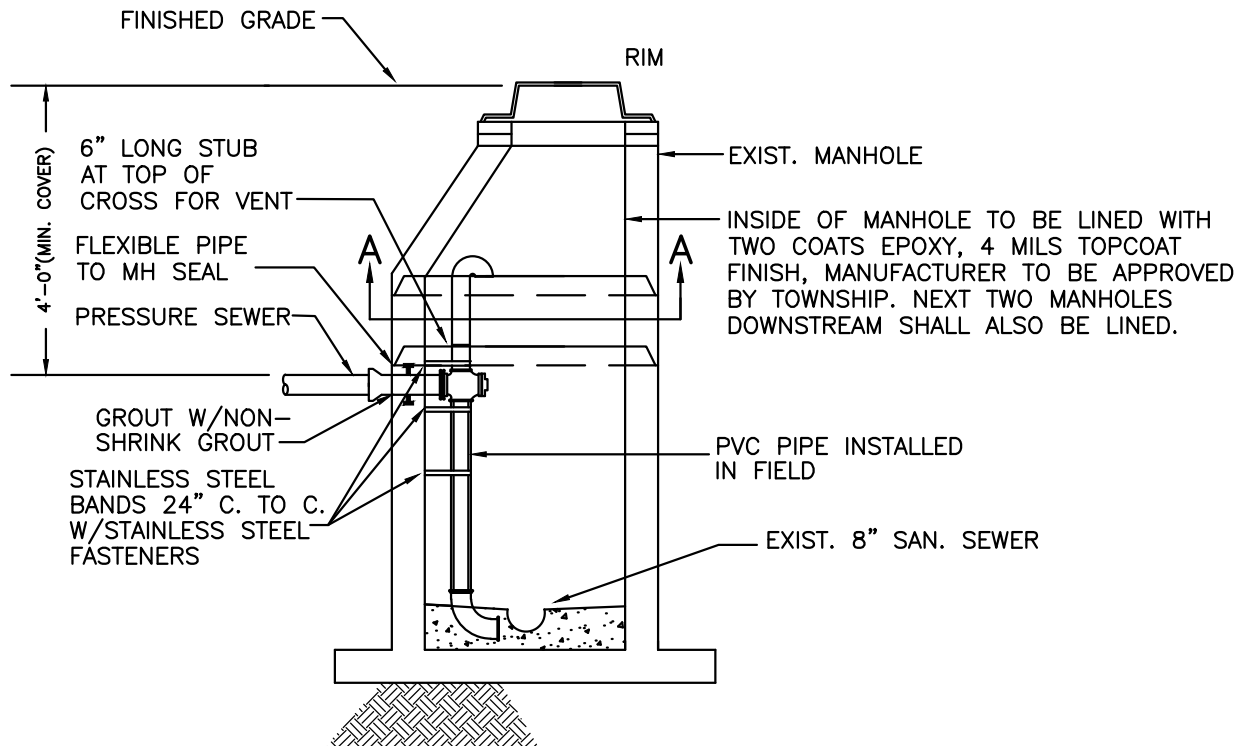
MODIFY EXISTING BENCH CHANNEL  
FOR PROPOSED 8" PVC SANITARY  
SEWER DROP CONNECTION:



NOTE:

CUT OPENING IN EXISTING MANHOLE WALL, AT ONE (1)  
LOCATION, EQUAL TO PROPOSED SANITARY SEWER OUTSIDE  
DIAMETER PLUS 2". A WATERSTOP (FERNCO OR APPROVED  
EQUAL) SHALL BE PLACED AROUND THE PROPOSED SEWER,  
CENTERED IN THE MANHOLE WALL AND EMBEDDED IN  
NON-SHRINK GROUT WHICH SHALL BE USED TO SEAL THE  
ANNULAR OPENED.

## SECTION A-A



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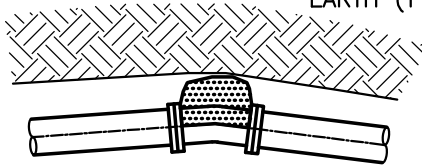
ORIGINATION DATE	2-26-21
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**SANITARY SEWER SYSTEM**

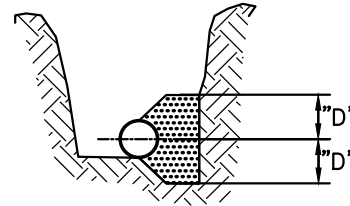
**DETAIL # 25**  
**PRESSURE SEWER**  
**CONNECTION TO**  
**EXISTING MANHOLE**

90° TO TANGENT  
OF PIPE

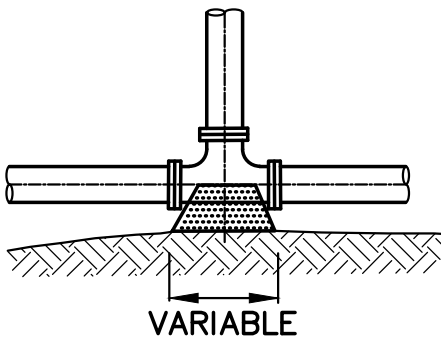
UNDISTURBED  
EARTH (TYP.)



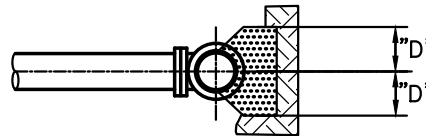
3,750 P.S.I. CONCRETE



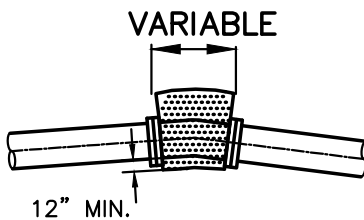
## HORIZONTAL BENDS



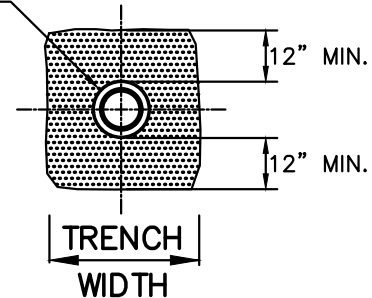
3,750 P.S.I. CONCRETE



## HORIZONTAL TEES



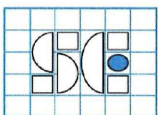
3,750 P.S.I. CONCRETE  
BELL OF PIPE



## VERTICAL BENDS

### NOTES:

1. THRUST BLOCKS MUST BEAR AGAINST UNDISTURBED EARTH.
2. SIZE OF THRUST BLOCKS TO BE DETERMINED INDIVIDUALLY AT TIME OF CONSTRUCTION.
3. HARNESS OR RESTRAINT PIPE IF ORDERED.
4. "D" IS EQUAL TO DIAMETER OF PIPE.



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**WHITPAIN TOWNSHIP**  
MONTGOMERY, COUNTY, PA.  
**SANITARY SEWER SYSTEM**

**DETAIL # 26**  
**TYPICAL THRUST**  
**BLOCKS**