

TEMPORARY

PERMANENT

TOWNSHIP PAVEMENT RESTORATION NOTES:

1. RESTORE WITH SUPERPAVE (25mm) TO SURFACE AND ALLOW TO SETTLE FOR 90 DAYS. SUPERPAVE DEPTH OF 6-1/2" OR TO MATCH EXISTING PAVING, WHICHEVER IS GREATER.
2. MILL RESTORED AREA PLUS 1 FOOT TO EACH SIDE OF TRENCH TO 1-1/2" DEPTH.
3. PAVE MILLED AREA WITH 1-1/2" OF SUPERPAVE (9.5mm).
4. SEAL EDGES WITH PG64-22.
5. PAVEMENT SAWCUTTING SHALL PROVIDE A CLEAN AND NEAT EDGE AT RIGHT ANGLES OF SURFACE OF PAVEMENT TO REMAIN.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

TRENCH RESTORATION DETAIL FOR EXISTING PAVED AREAS

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S1

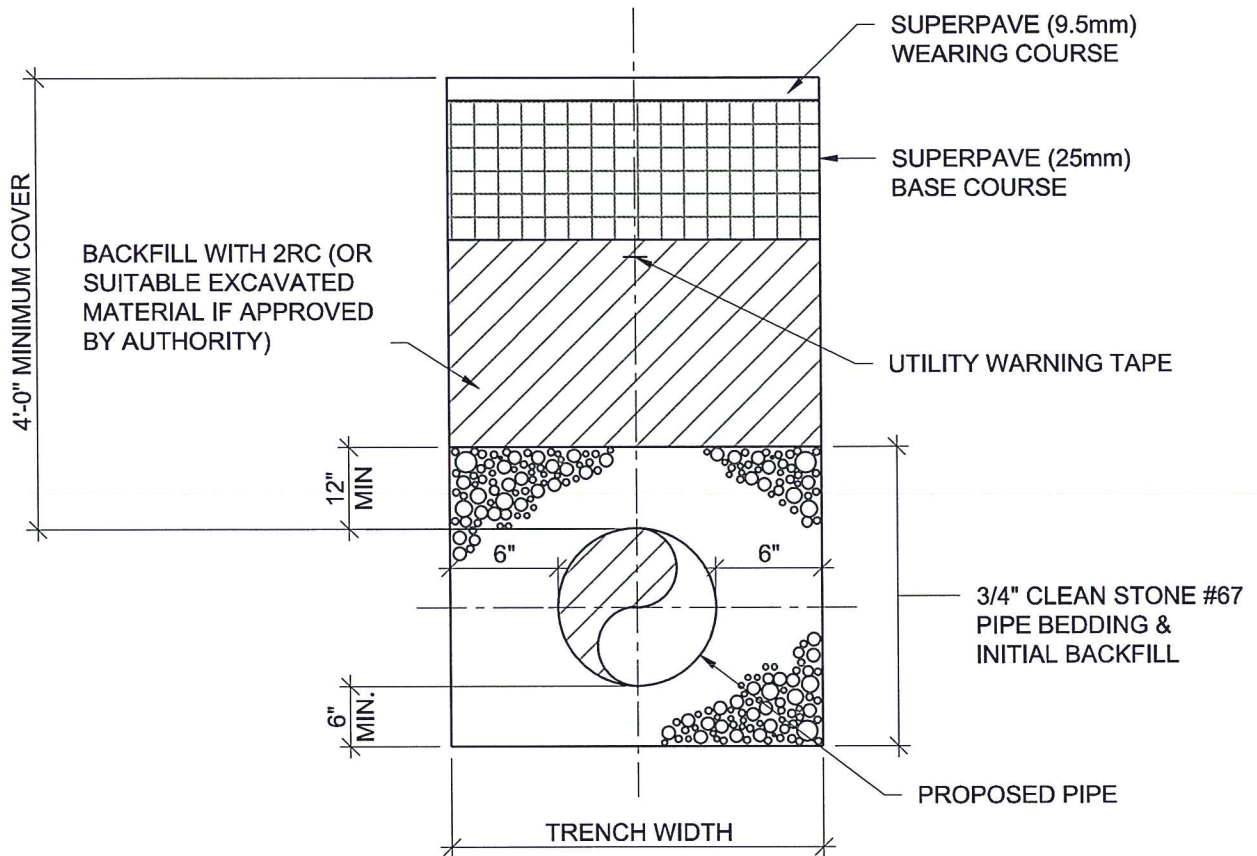
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



NEW DEVELOPMENT RESIDENTIAL STREET PAVMENT NOTES:

1. RESTORE WITH SUPERPAVE (25mm) TO SURFACE AND ALLOW TO SETTLE FOR 90 DAYS.
2. FINAL PAVE WITH SUPERPAVE (9.5mm)
3. PAVEMENT CROSS SECTION AS REQUIRED BY TOWNSHIP.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

TRENCH RESTORATION FOR NEW DEVELOPMENT RESIDENTIAL STREETS

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

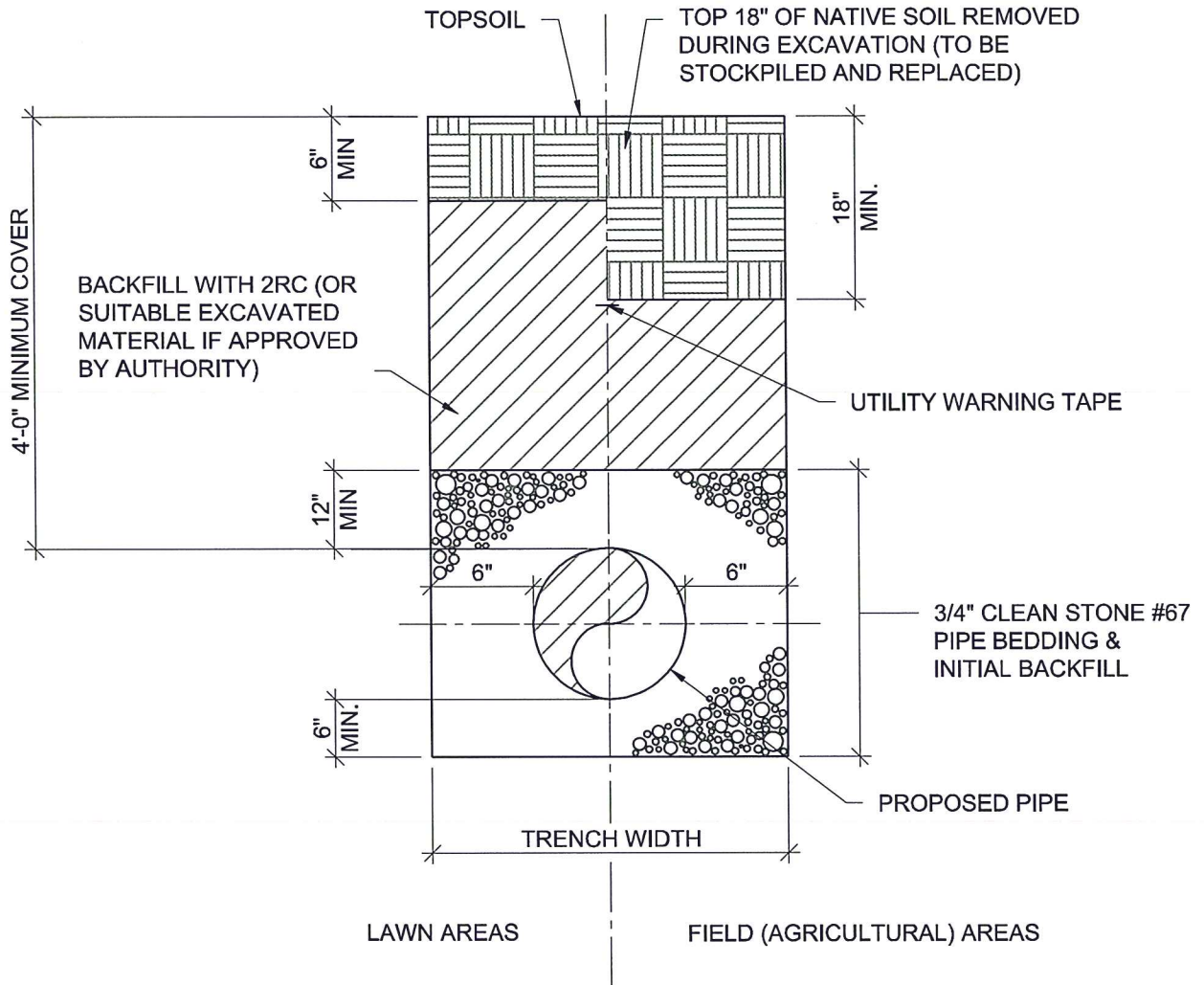
CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S1A



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

TRENCH RESTORATION LAWN / FIELD AREAS

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S2

PREPARED BY
CAD

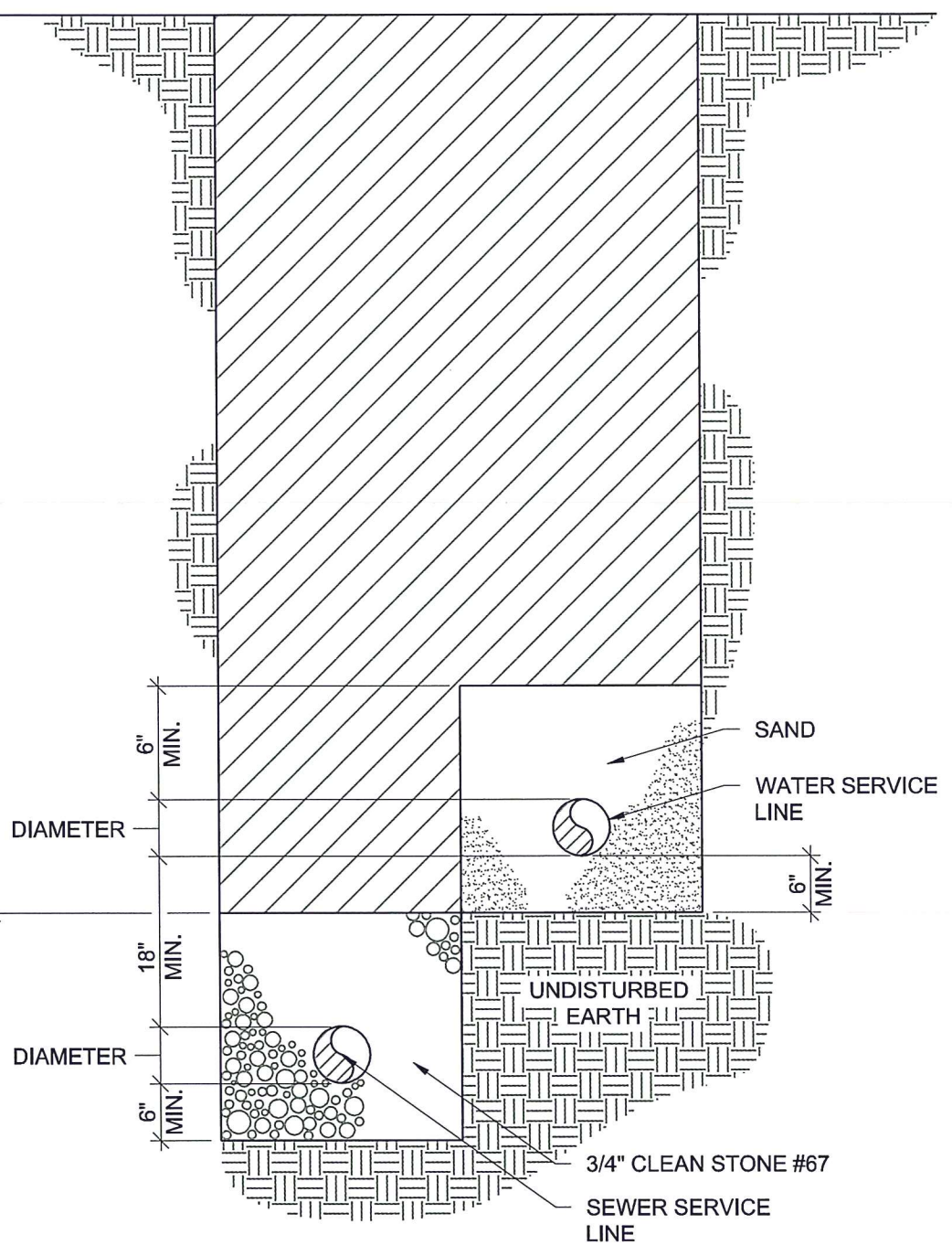
CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

BACKFILL AND
SURFACING AS
REQUIRED BY
S1, W1, S2 OR W2
(AS APPROPRIATE)



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

COMBINED WATER / SEWER TRENCH (LATERALS ONLY)

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

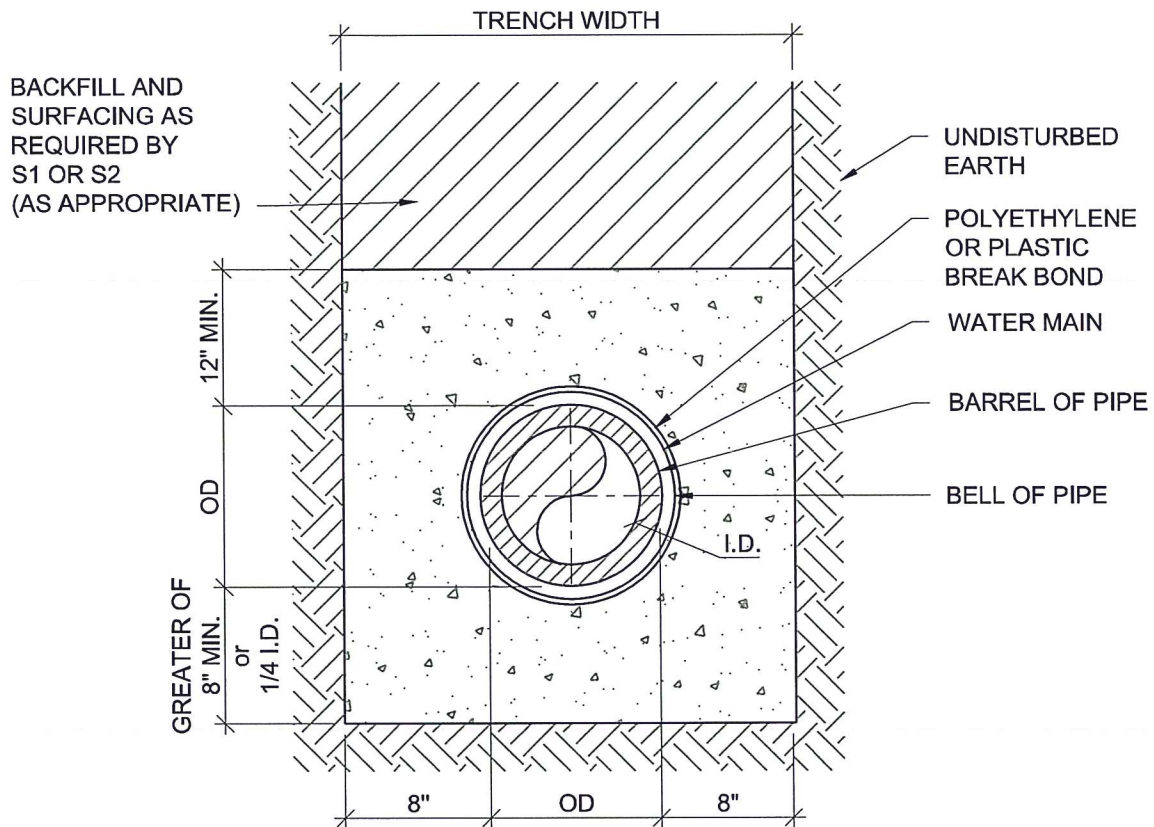
CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S3



NOTE: ALL CONCRETE SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

CONCRETE ENCASUREMENT

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S4

DELETED



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

CONCRETE SLOPE COLLAR ANCHOR

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S5

PREPARED BY

-

CHECKED BY

-

APPROVED BY

-

REV. / DATE

- -

PROJECT NO.

4185.001

HORIZONTAL BENDS							
NOMINAL PIPE DIA.	LENGTH OF PIPE RESTRAINT REQUIRED PER FITTING IN FEET						
	11.25°	22.5°	45°	90°	TEE	CAP/VALVE	REDUCER
4	2	3	6	13	11	14	--
6	2	4	8	19	16	20	10
8	3	5	10	25	23	26	11
10	3	6	13	30	28	32	11
12	4	7	15	35	34	38	11
16	5	10	19	46	46	49	21

VERTICAL BENDS								
NOMINAL PIPE DIA.	LENGTH OF PIPE RESTRAINT REQUIRED PER FITTING IN FEET							
	VERTICAL UP BEND ANGLE				VERTICAL DOWN BEND ANGLE			
	11.25°	22.5°	45°	90°	11.25°	22.5°	45°	90°
4	2	3	6	13	3	6	12	28
6	2	4	8	19	4	8	16	39
8	3	5	10	25	6	11	22	52
10	3	6	13	30	7	13	26	63
12	4	7	15	35	8	15	31	75
16	5	10	19	46	10	20	41	98

NOTES:

1. LENGTHS ARE BASED ON THE DUCTILE IRON PIPE RESEARCH ASSOCIATION THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE ONLINE CALCULATOR, ACCESSED 01/03/2020. ASSUMING THE FOLLOWING: TRENCH - TYPE 5, SOIL - CLAY 1, BURY DEPTH 4', PRESSURE 150 PSI, SAFETY FACTOR 1.5, AND TEE RUN LENGTH TO FIRST JOINT 6'.
2. LENGTHS ARE PROVIDED FOR DUCTILE IRON PIPE WITHOUT POLYETHYLENE WRAP. POLYETHYLENE WRAP WILL REQUIRE ADDITIONAL RESTRAINT LENGTH TO BE DETERMINED ON AN AS NEEDED BASIS BY WTMA ENGINEER.
3. REDUCER LENGTHS ARE GIVEN FROM THE INDICATED SIZE TO THE NEXT SMALLER SIZE. REDUCER RESTRAINT LENGTHS SHOULD BE ADDED IF GREATER REDUCTION IS REQUIRED (I.E. 16" TO 8" = 21+11+11 = 43 FEET)



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

RESTRAINED PIPE LENGTH SCHEDULE

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S6

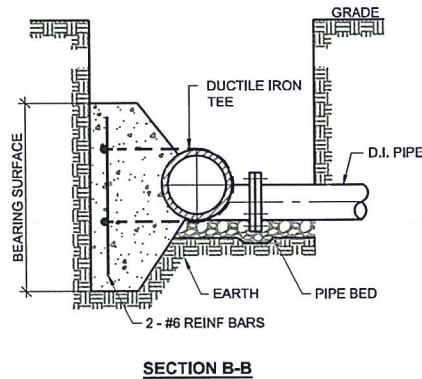
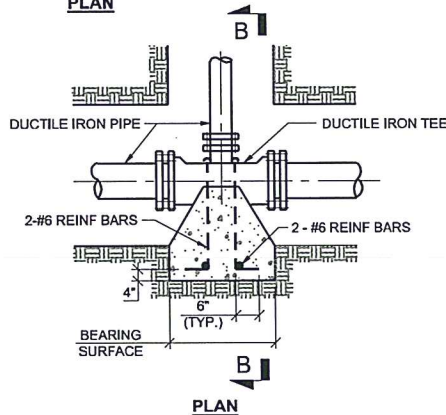
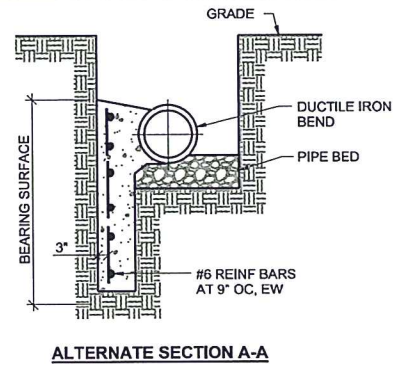
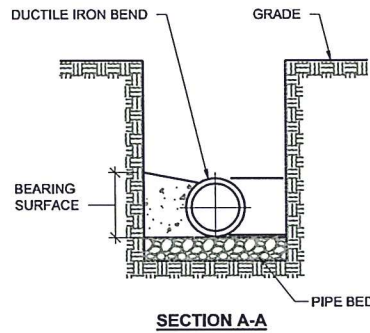
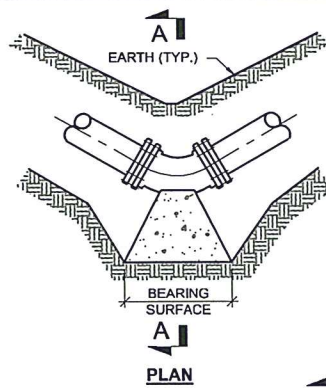
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



THRUST BLOCKING SCHEDULE OF DIMENSIONS								
MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUSTS DOWNWARD * BASED UPON 150 PSI PRESSURE *								
PIPE SIZES →	4", 6" AND 8"				10" AND 12"			
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
	11 1/4°	22 1/2°	45°	90°	11 1/4°	22 1/2°	45°	90°
SAND 1 TON/SQ FT SOFT CLAY 1 TON/SQ FT	1.50	3.00	6.00	12.00	3.00	6.00	12.00	24.50
SAND & GRAVEL 2 TON/SQ FT	1.00	1.50	3.00	6.00	1.50	3.00	6.00	12.00
CLAY 3 TON/SQ FT	1.00	1.00	2.00	4.00	1.00	2.00	4.00	8.00
SOFT ROCK 5 TON/SQ FT	1.00	1.00	1.00	2.50	1.00	1.00	2.50	5.00
ROCK 20 TON/SQ FT	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUSTS DOWNWARD * BASED UPON 150 PSI PRESSURE *								
PIPE SIZES →	16"							
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	DEGREE BEND OR DEFLECTION							
	11 1/4°	22 1/2°	45°	90°				
SAND 1 TON/SQ FT SOFT CLAY 1 TON/SQ FT	5.50	11.00	21.50	43.00				
SAND & GRAVEL 2 TON/SQ FT	2.50	5.50	11.00	21.50				
CLAY 3 TON/SQ FT	2.00	3.50	7.00	14.00				
SOFT ROCK 5 TON/SQ FT	1.00	2.00	4.50	8.50				
ROCK 20 TON/SQ FT	1.00	1.00	1.00	2.00				

NOTES:

- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS. POURED CONCRETE OR SAKCRETE ONLY.
- ALL REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS.
- INSTALL CONCRETE THRUST BLOCKS AT EACH ELBOW, TEE AND CAPPED OR VALVED END FITTINGS LOCATED IN THE HORIZONTAL PLANE.
- PAINT ALL EXPOSED STEEL WITH TWO COATS OF ASPHALT PAINT.
- NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
- STAINLESS STEEL ALL-THREADS WITH PIPE STRAPS MAY BE USED IN PLACE OF REINFORCING BARS.
- ALL THRUST BLOCKS SHOWN ARE INTENDED AS A GUIDE AND SHALL WITHSTAND THE REQUIRED PRESSURE.
- MEGALUGS REQUIRED ON ALL MECHANICAL JOINT FITTINGS.
- CERTAIN SITUATIONS MAY WARRANT THE USE OF TIE RODS AS INDICATED ON THIS DETAIL OR AS REQUIRED BY THE AUTHORITY.
- PIPING SHALL BE WRAPPED WITH POLYETHYLENE PRIOR TO PLACEMENT OF CONCRETE.
- FOR SOIL BEARING VALUES LESS THAN 1 TON / SQ. FT., CONSULT WITH AUTHORITY ENGINEER FOR RECOMMENDATION.
- CONCRETE QUANTITY TO BE IN ACCORDANCE WITH THIS DETAIL. MINIMUM AMOUNT OF CONCRETE MUST BE INSTALLED.



WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

HORIZONTAL THRUST BLOCKING

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

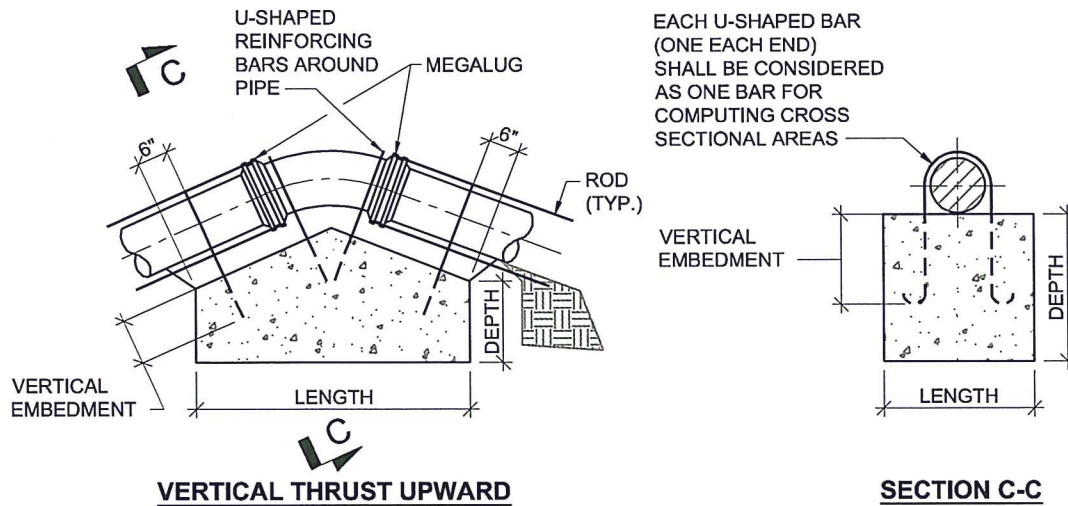
PROJECT NO.
4185.001

S7

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER



VERTICAL THRUST BLOCKING UPWARD THRUSTS SCHEDULE OF DIMENSIONS

* BASED UPON 150 PSI PRESSURE *

PIPE SIZE	4", 6" AND 8"			10" AND 12"			16"		
DEGREE BEND OR DEFLECTION	11 1/4°	22 1/2°	45°	11 1/4°	22 1/2°	45°	11 1/4°	22 1/2°	45°
LENGTH	3.00	4.00	6.00	4.50	6.00	8.00	6.00	8.00	11.00
WIDTH	3.00	3.00	3.00	3.00	3.00	4.00	3.50	3.50	5.00
DEPTH	2.00	3.00	4.00	3.00	4.50	5.00	3.50	5.00	5.00
SQ. IN. REINFORCING	0.17	0.33	0.65	0.37	0.74	1.46	0.66	1.32	2.60

BAR NO.	5	6	7	8	9	10	11
CROSS-SECTION IN ² PER BAR	0.31	0.44	0.60	0.79	1.00	1.27	1.56
VERTICAL EMBEDMENT	15"	19"	26"	35"	44"	56"	68"

NOTES:

- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS. POURED CONCRETE OR SAKCRETE ONLY.
- ALL REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS.
- INSTALL CONCRETE THRUST BLOCKS AT EACH ELBOW, TEE AND CAPPED OR VALVED END FITTINGS LOCATED IN THE VERTICAL PLANE.
- PAINT ALL EXPOSED STEEL WITH TWO COATS OF ASPHALT PAINT.
- NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
- STAINLESS STEEL ALL-THREADS WITH PIPE STRAPS MAY BE USED IN PLACE OF REINFORCING BARS.
- ALL THRUST BLOCKS SHOWN ARE INTENDED AS A GUIDE AND SHALL WITHSTAND THE REQUIRED PRESSURE.
- MEGALUGS REQUIRED ON ALL MECHANICAL JOINT FITTINGS.
- CERTAIN SITUATIONS MAY WARRANT THE USE OF TIE RODS AS INDICATED ON THIS DETAIL OR AS REQUESTED BY THE AUTHORITY.
- PIPING SHALL BE WRAPPED WITH POLYETHYLENE PRIOR TO PLACEMENT OF CONCRETE.
- FOR SOIL BEARING VALUES LESS THAN 1 TON / SQ. FT., CONSULT WITH AUTHORITY ENGINEER FOR RECOMMENDATION.
- CONCRETE QUANTITY TO BE IN ACCORDANCE WITH THIS DETAIL. MINIMUM AMOUNT OF CONCRETE MUST BE INSTALLED.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

VERTICAL THRUST BLOCKING

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S8

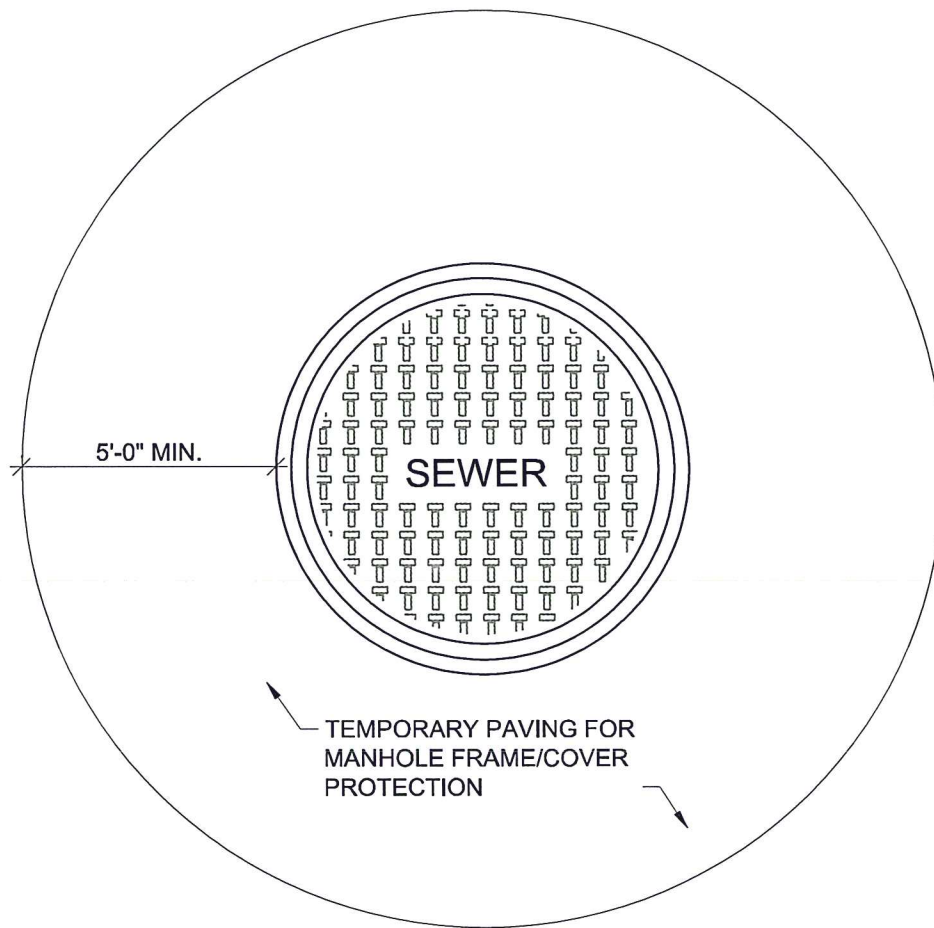
PREPARED BY
CAD

CHECKED BY
TAL

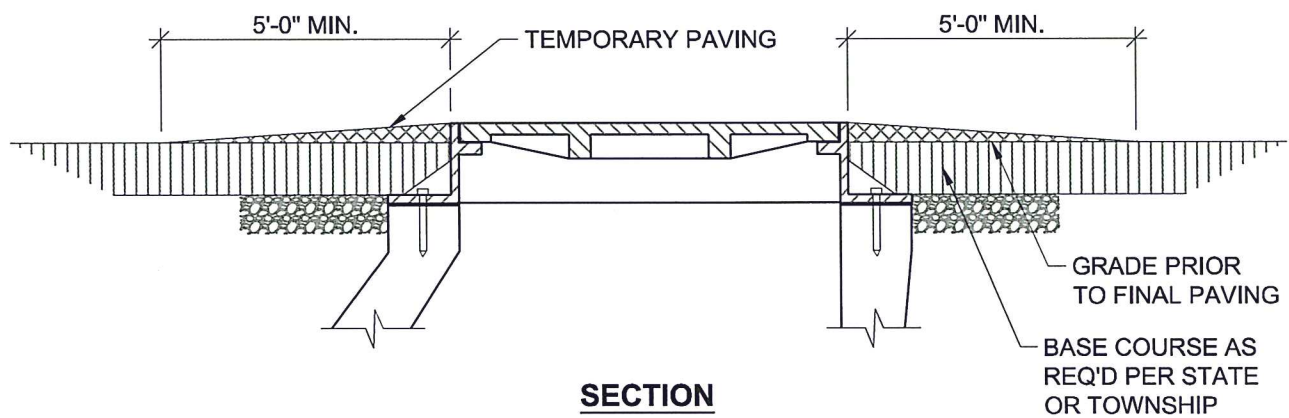
APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



PLAN



SECTION



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

MANHOLE FRAME / COVER PROTECTION - (TEMPORARY PAVING)

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

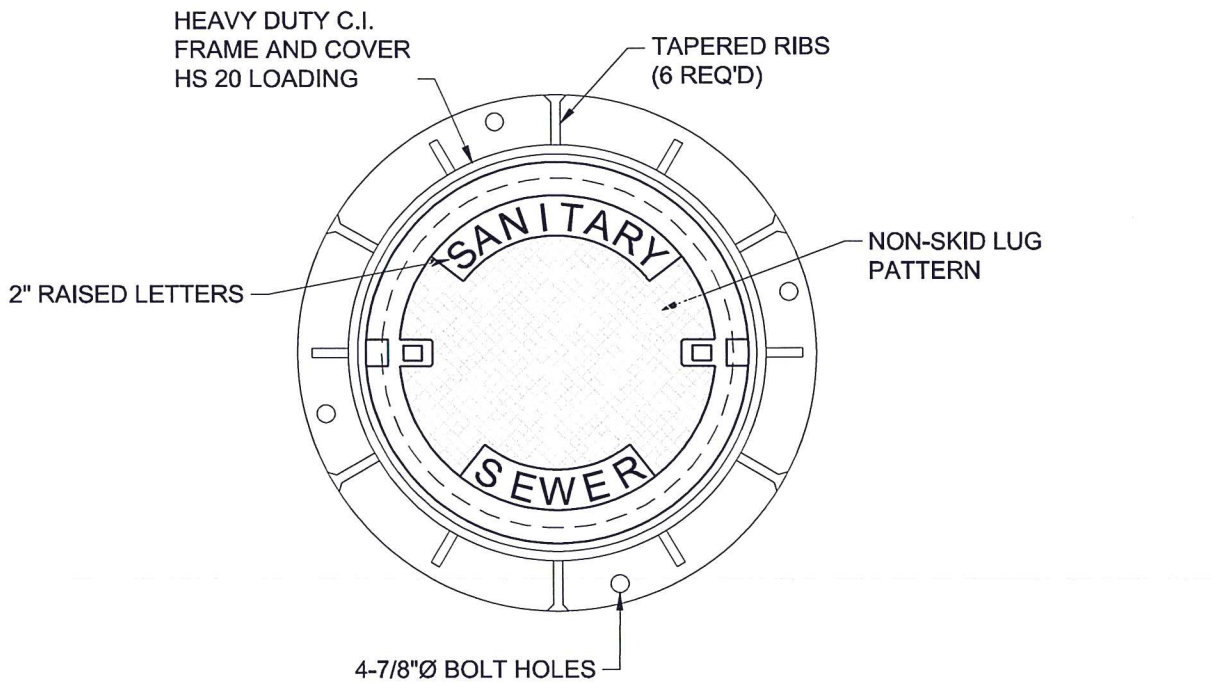
CHECKED BY
TAL

APPROVED BY
SER

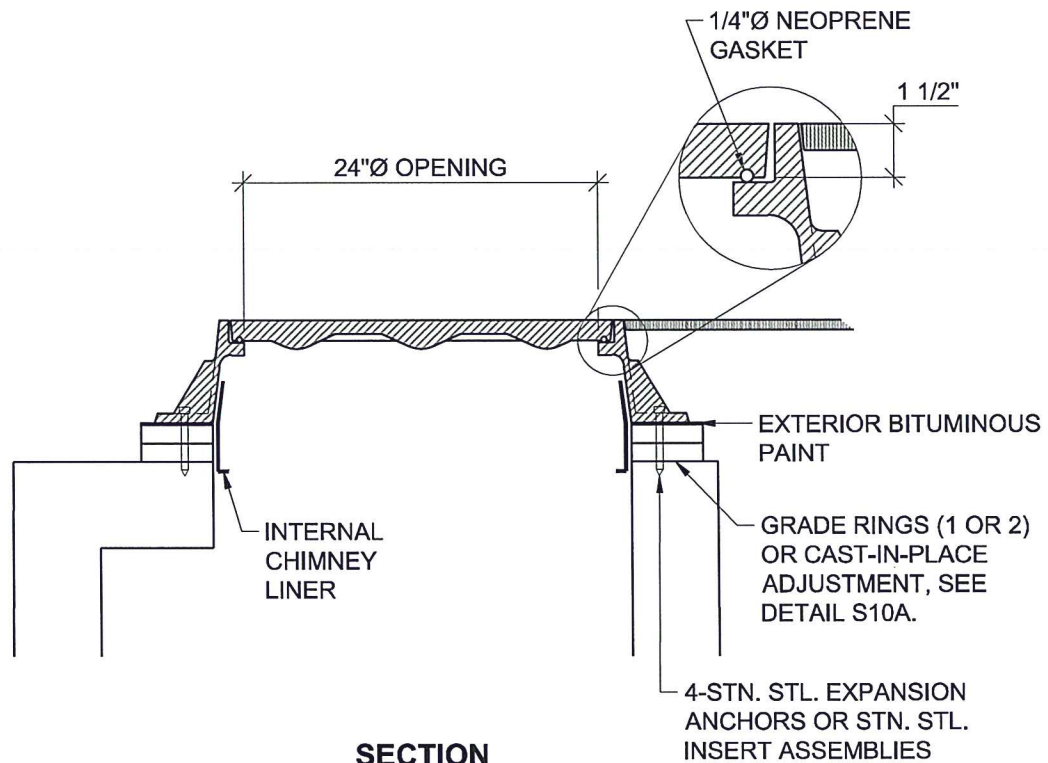
REV. / DATE
- -

PROJECT NO.
4185.001

S9



PLAN



SECTION



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

STANDARD MANHOLE FRAME & COVER

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

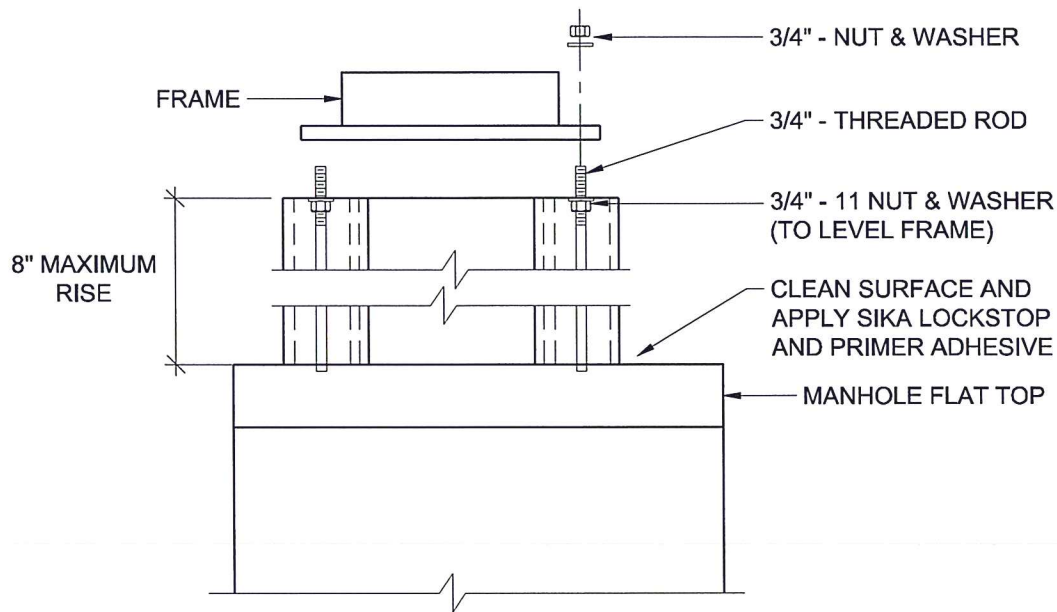
CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S10



ELEVATION

NOTES:

1. CUT SONOTUBE TO FINISH GRADE HEIGHT INSIDE AND OUTSIDE DIAMETERS TO MATCH FRAME.
2. SET THREADED ROD TO MANHOLE FRAME HEIGHT (SCREW INTO MANHOLE CONE)
3. INSTALL NUTS TO LEVEL FRAME.
4. REMOVE FRAME.
5. INSTALL PVC TUBING OR BREAK BOND AROUND THREADED RODS.
6. POUR CONCRETE TO THE TOP OF THE LEVELING NUTS (3,000 PSI CONCRETE MINIMUM)
7. SET THE FRAME ONTO THE RODS AFTER CONCRETE HAS CURED, REMOVE FRAME AND APPLY TWO (2) RINGS OF BUTYL RUBBER JOINT SEALANT.
8. INSTALL WASHER & NUT TO SECURE THE FRAME AFTER THE FRAME IS SET.
9. INSTALL CHIMNEY SEAL TO INTERIOR AND APPLY BITUMINOUS EPOXY PAINT TO EXTERIOR.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

CAST-IN-PLACE MANHOLE GRADE ADJUSTMENT

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

CHECKED BY
TAL

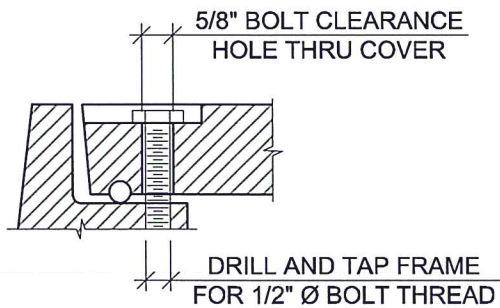
APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

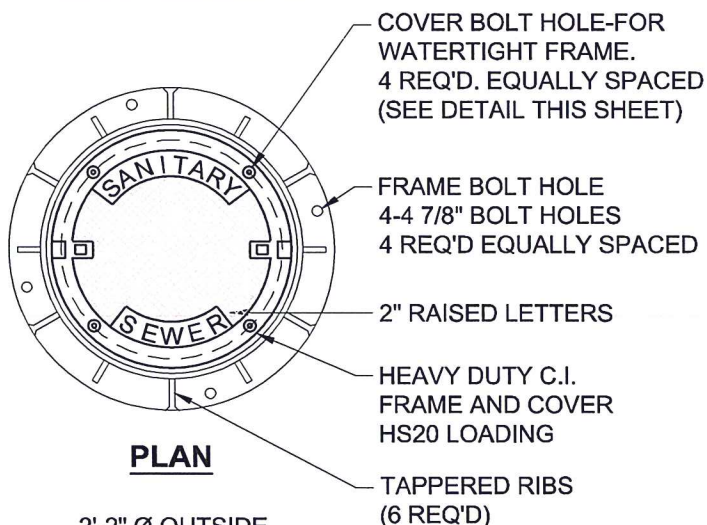
S10A

PLAN

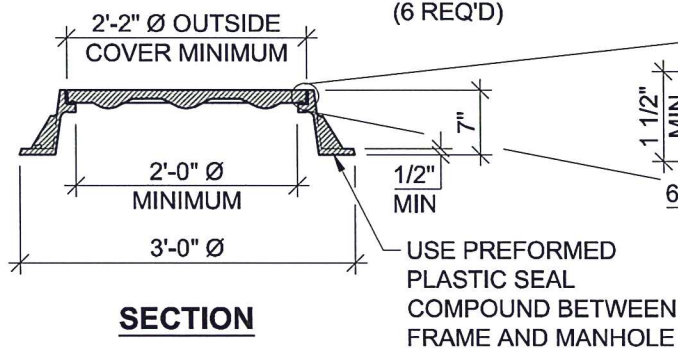


SECTION

COVER BOLT HOLE



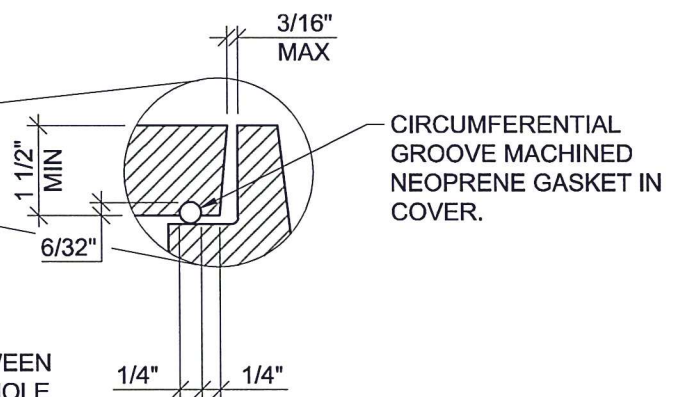
PLAN



SECTION

MANHOLE FRAME AND COVER NUTS:

1. ALL MANHOLE FRAMES AND COVERS SHALL BE FOR HEAVY DUTY TRAFFIC, AASHTO HIGHWAY LOADING CLASS HS-20.
2. APPLY LUBRICANT TO COVER BOLTS. USE 20-30 FT/LBS. MAXIMUM TORQUE.




1.800.825.1372
www.entecheng.com

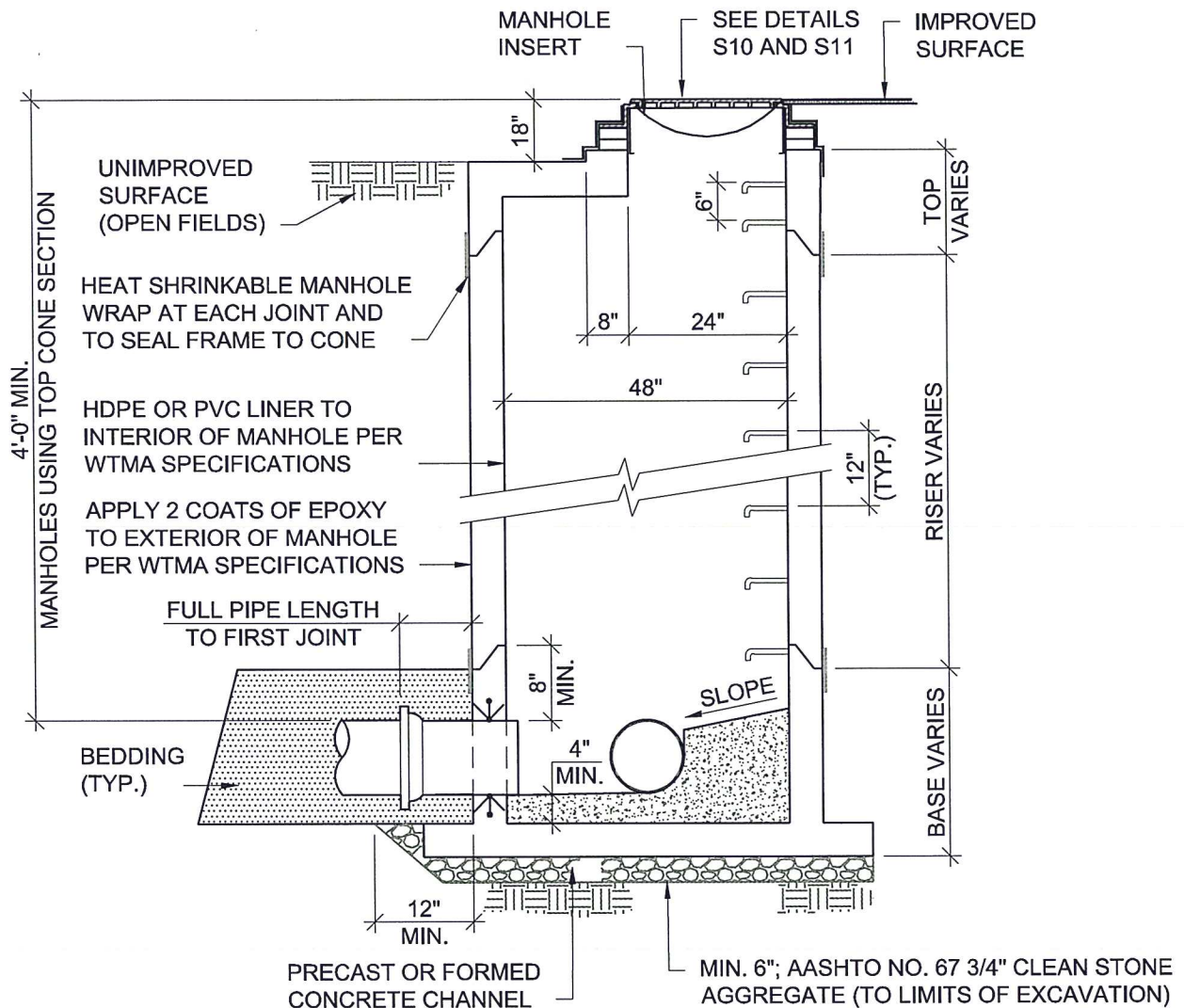
WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

BOLT DOWN TYPE WATERTIGHT FRAME & COVER

			DATE: MARCH 2020	SCALE: N.T.S.	DRAWING NO. S11
			PREPARED BY CAD	CHECKED BY TAL	



NOTES:

1. ADJUST TO GRADE WITH CAST-IN-PLACE GRADE RINGS.
2. PRECAST CONCRETE TO CONFORM TO ASTM C-478.
3. SEAL ALL MANHOLE JOINTS WITH 2 RINGS OF BUTYL RUBBER SEALING COMPOUND.
4. SEAL ALL PIPE OPENINGS WITH CAST-IN-PLACE RUBBER GASKETS (8" ONLY), A-LOK CAST-IN-PLACE RUBBER GASKETS (12" AND UP), OR PBX BOOT (12" AND UP).
5. MANHOLE STEPS SHALL BE COPOLYMER POLYPROPYLENE, PLASTIC COATED 1/2" DIA. GRADE 60 STEEL REINFORCEMENT BY MA INDUSTRIES OR APPROVED EQUAL.
6. PROVIDE 5' DIAMETER MANHOLE DEPTH GREATER THAN 12'.
7. PROVIDE 5' DIAMETER MANHOLE FOR SEWER MAINS GREATER THAN 18" DIAMETER.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

PRECAST SEWER MANHOLE (LESS THAN 16' DEPTH)

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

PROJECT NO.
4185.001

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

S12

DELETED



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

PRECAST DEEP MANHOLE

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S13

PREPARED BY

-

CHECKED BY

-

APPROVED BY

-

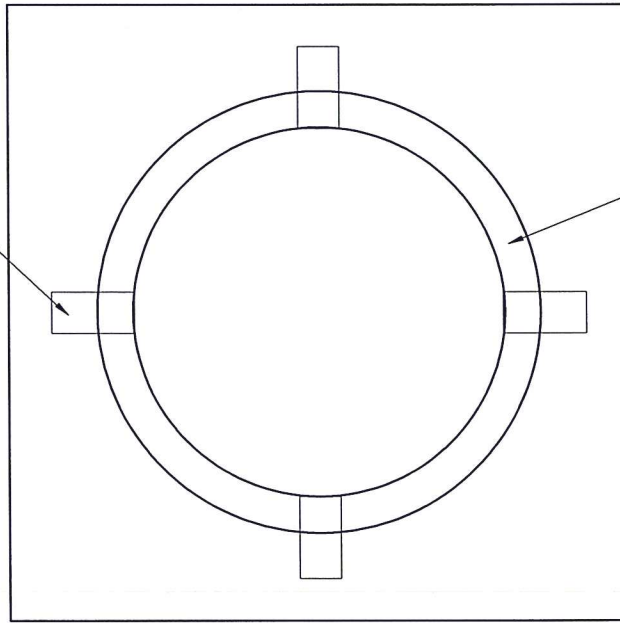
REV. / DATE

- -

PROJECT NO.

4185.001

8"x8" CONCRETE BLOCK
AS REQ'D TO BE PLACED
INSIDE 12" O.C. SPACING
OF REBAR MATS



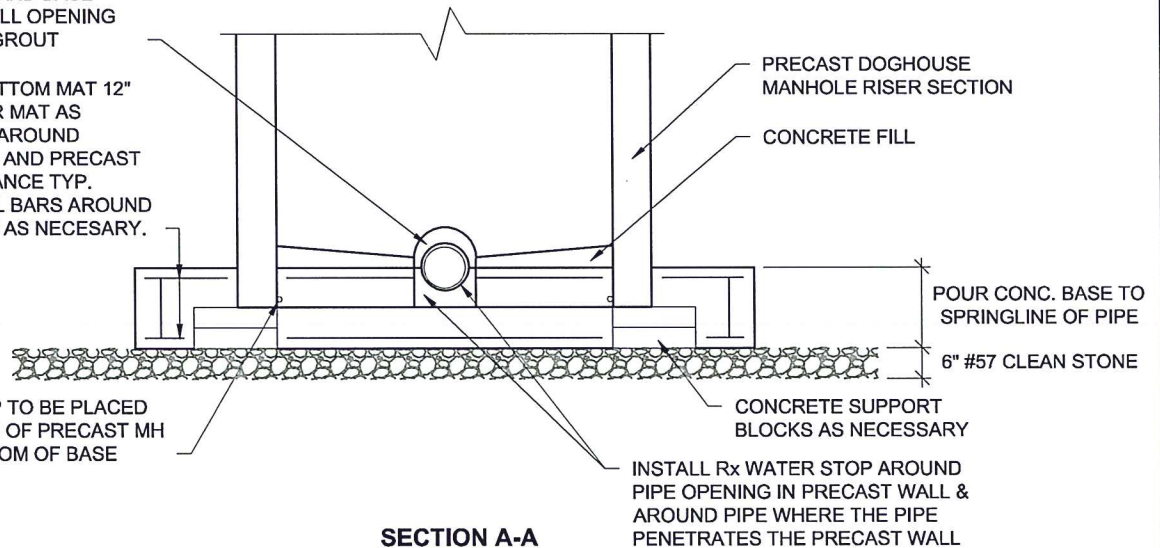
PRECAST DOGHOUSE
MANHOLE RISER SECTION



PLAN VIEW

INSTALL Rx WATER STOP AROUND
PRECAST OPENING AND BASE
CONCRETE, THEN FILL OPENING
WITH NON-SHRINK GROUT

#5 REBAR TOP & BOTTOM MAT 12"
O.C.E.W. CUT REBAR MAT AS
NECESSARY TO FIT AROUND
CONCRETE BLOCKS AND PRECAST
MANHOLE 2' CLEARANCE TYP.
INSTALL ADDITIONAL BARS AROUND
CONCRETE BLOCKS AS NECESSARY.



SECTION A-A

NOTES:

1. THE SHELF SLOPES TOWARD THE EXISTING PIPE AT THE RATE OF 1" PER FOOT.
2. WHEN THE SHELF IS COMPLETE, REMOVE THE EXPOSED PORTIONS OF THE EXISTING PIPE
3. SEE STANDARD MANHOLE DETAILS FOR TOP SECTION, FRAME AND COVER REQUIREMENTS
4. FILL OPENING WITH NON-SHRINK GROUT.
5. CAST-IN-PLACE CONCRETE MANHOLE BASE.
6. WHEN SHELF IS COMPLETE, THE EXISTING PIPE WILL BE REMOVED.
7. A MINIMUM OF 1' OF CONCRETE WILL BE PLACED UNDER EXISTING PIPES.
8. CONCRETE BLOCK TO BE PLACED UNDER MANHOLE RISER RINGS.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

MANHOLE ON EXISTING SEWER CAST IN PLACE BASE DETAIL

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

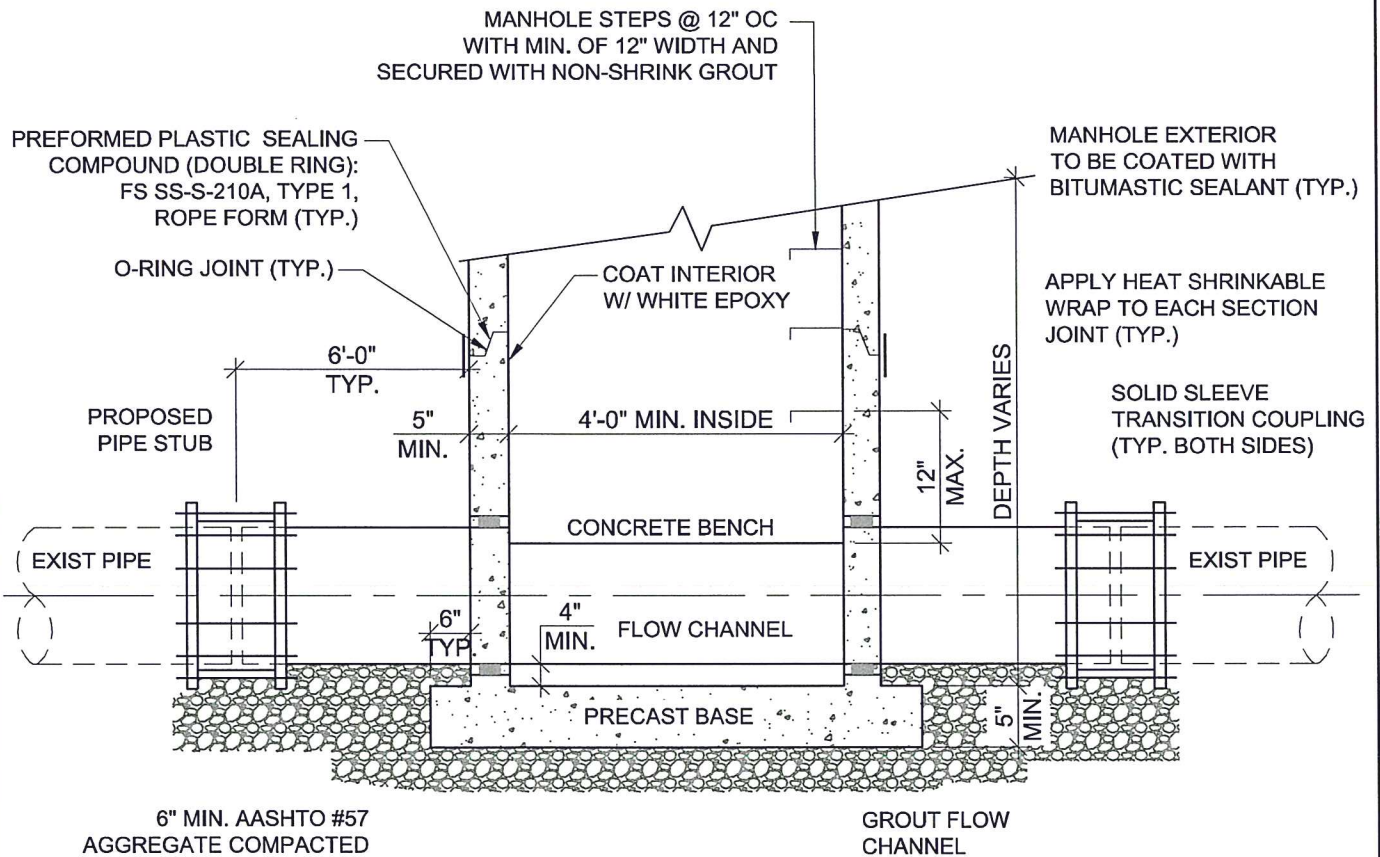
PROJECT NO.
4185.001

S14A

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER



ELEVATION

NOTES:

1. THE BENCH SHALL SLOPE TO INVERT CHANNEL AT THE RATE OF 1" PER FOOT (MIN.)
2. THE DEPTH OF THE INVERT CHANNEL SHALL BE NOT LESS THEN $\frac{3}{4}$ OF THE DIAMETER OF THE PIPE.
3. THE 48"Ø MANHOLE SHALL BE USED ON PIPE SIZES 8" TO 18"
4. FINISH GRADE SHALL BE FLUSH WITH TOP OF COVER, UNLESS OTHERWISE NOTED. MANHOLES INSTALLED OUTSIDE OF PAVED AREAS SHOULD BE RAISED A MINIMUM OF 18" ABOVE GROUND ELEVATION.
5. ALL PIPE TO MANHOLE CONNECTIONS SHALL BE MADE WITH A CAST-IN-PLACE GASKET. (TYP.) (A-LOK OR APPROVED EQUAL)
6. REFER TO APPROPRIATE MANHOLE DETAILS FOR UPPER SECTION REQUIREMENTS.
7. SOLID SLEEVE TRANSITION COUPLINGS SHALL INCLUDE A DUCTILE IRON MECHANICAL JOINT SOLID SLEEVE WITH MEGA-LUG GLANDS AND TRANSITION GASKETS (IF REQUIRED).



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

INSERTION MANHOLE DETAIL

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

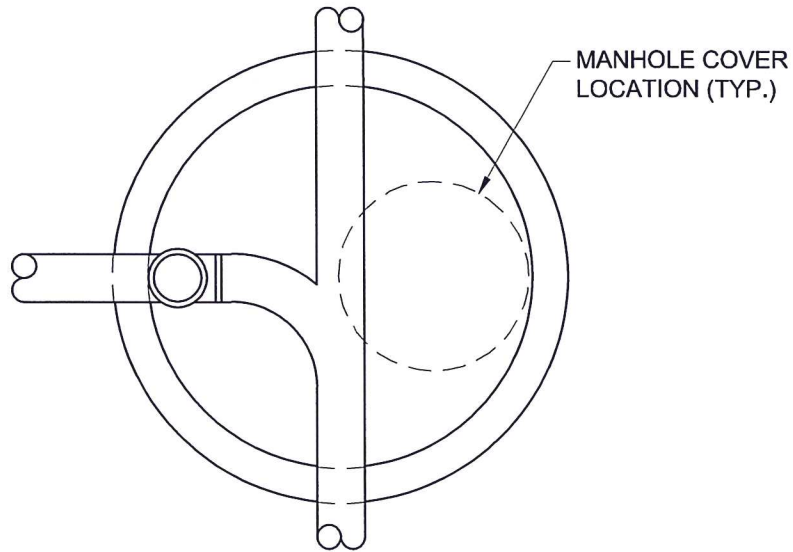
CHECKED BY
TAL

APPROVED BY
SER

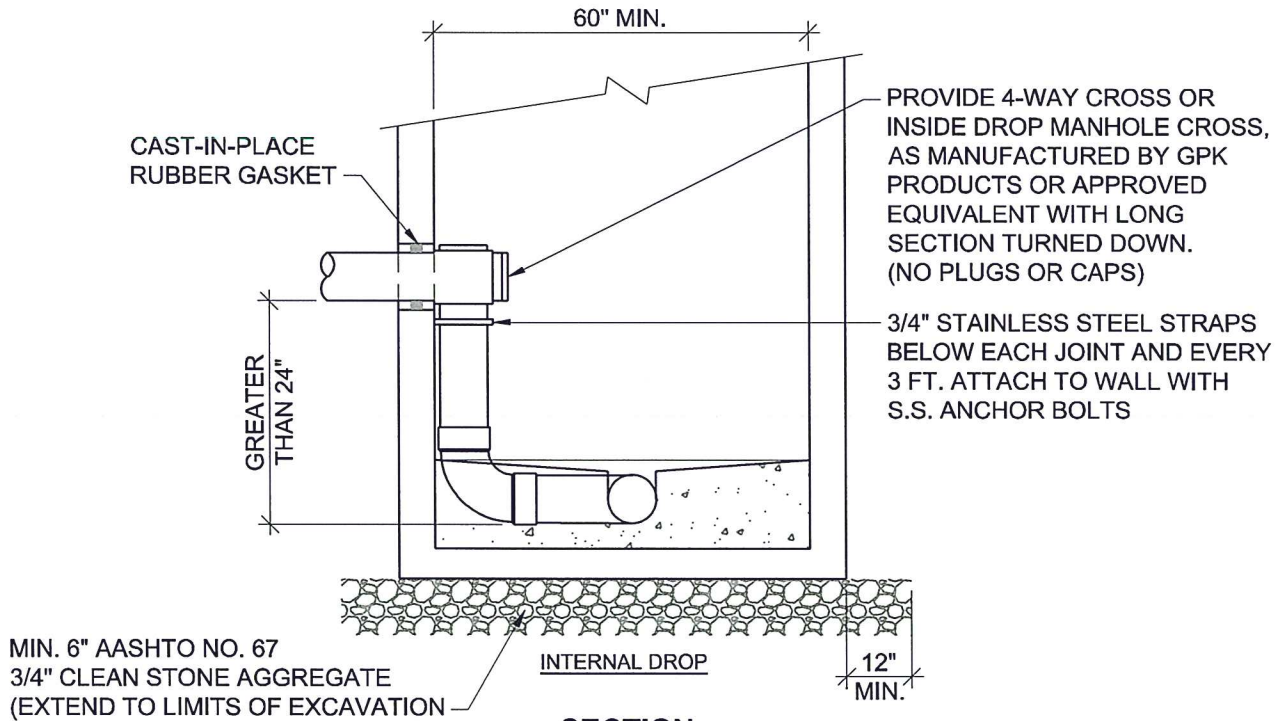
REV. / DATE
- -

PROJECT NO.
4185.001

S14B



SECTIONAL PLAN



SECTION

NOTES:

1. SEAL ALL PIPE OPENINGS WITH CAST-IN RUBBER GASKETS
2. SEE PRECAST MANHOLE AND FRAME & COVER DETAILS FOR ADDITIONAL REQUIREMENTS
3. PROVIDE FULL PIPE LENGTH FROM MANHOLE TO FIRST JOINT



WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

PRECAST INTERNAL DROP MANHOLE

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

PROJECT NO.
4185.001

S15

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

DELETED



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SANITARY SEWER SAMPLING MANHOLE

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S16

PREPARED BY

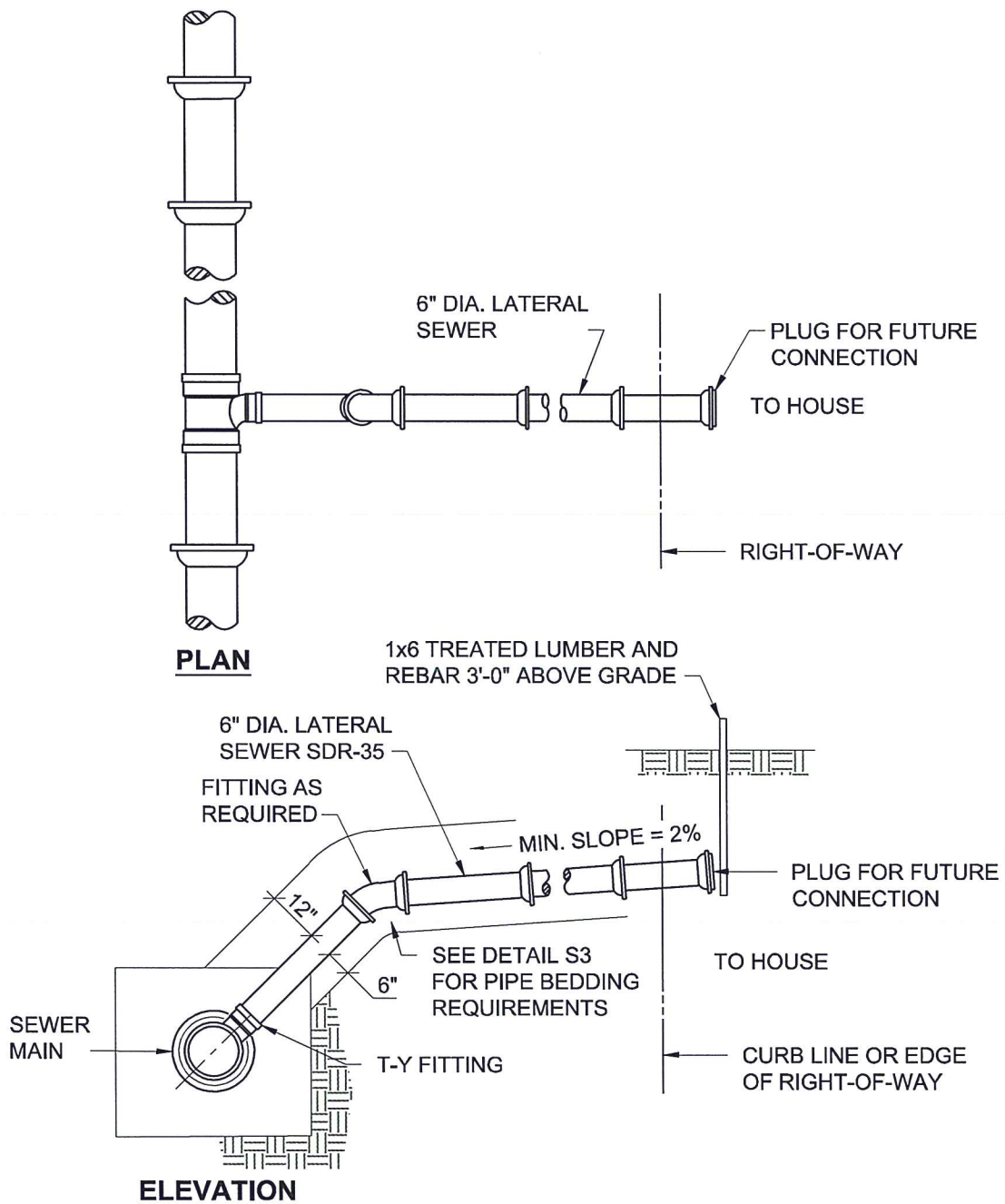
CHECKED BY

APPROVED BY

REV. / DATE

PROJECT NO.

4185.001



NOTES:

1. EXTEND LATERAL TO 5 FEET BEYOND RIGHT-OF-WAY UNLESS A LESSER DISTANCE IS DIRECTED BY THE AUTHORITY.
2. STAMP CURB "S" ABOVE LATERAL.
3. WYE TO BE USED IF LATERAL IS CONNECTED TO GRINDER PUMP.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SANITARY SEWER LATERAL

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S17

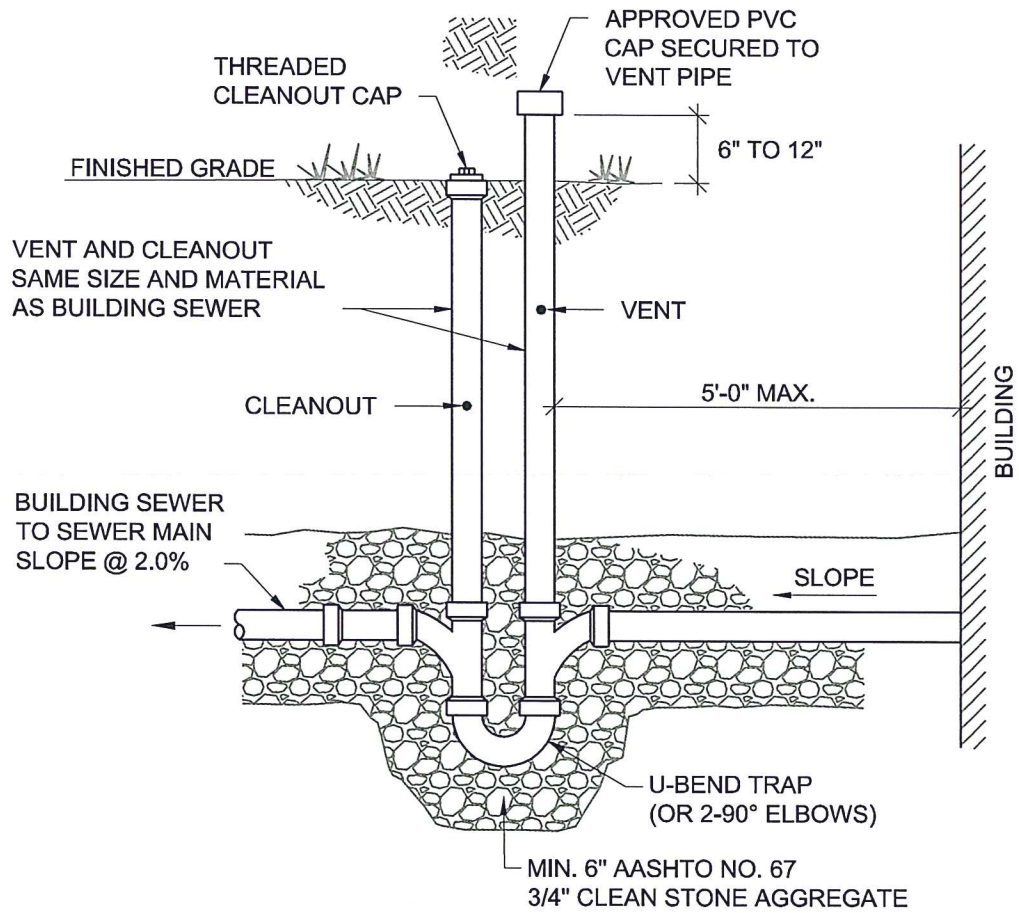
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



NOTES:

1. ALL FITTINGS USED FOR CLEANOUT, TRAP AND VENT SHALL BE SOLVENT WELD.
2. INSTALL PROTECTIVE BOX OVER VENT AND CLEANOUT IN ACCORDANCE WITH DETAIL S19 WHEN IN PAVED OR TRAFFIC AREAS.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SANITARY SEWER TRAP AND VENT

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S18

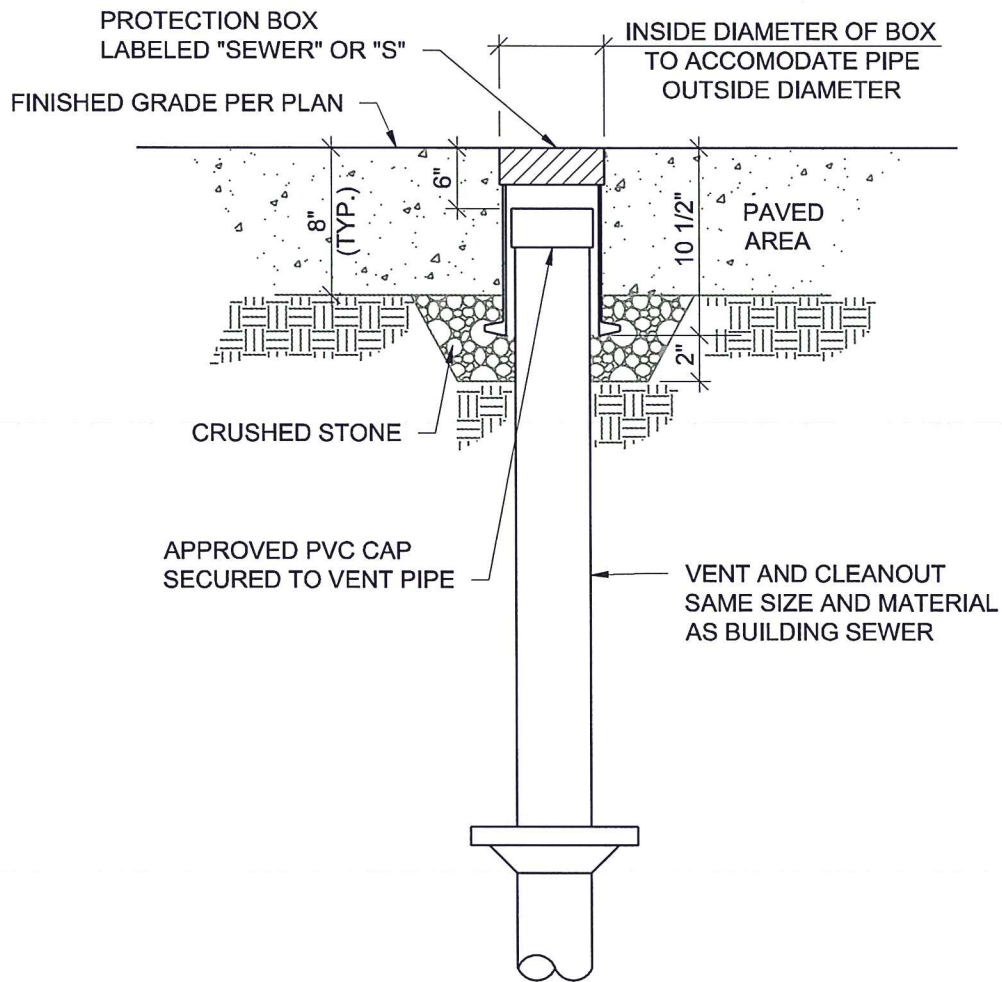
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



NOTES:

1. PROTECTION BOX TO BE SET FLUSH WITH PAVING SURFACE.
2. PROTECTION BOX AND COVER TO BE SUITABLE FOR TRAFFIC LOADING.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

TRAP AND VENT PROTECTION BOX

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S19

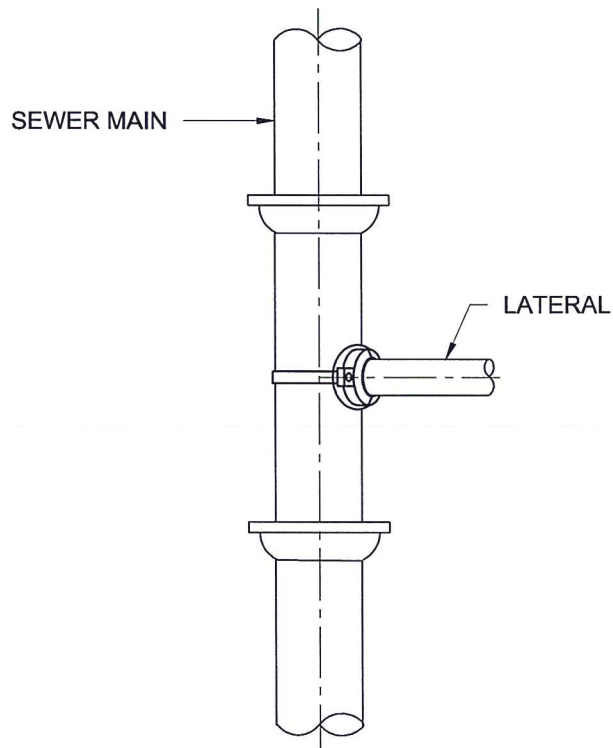
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



PLAN



ELEVATION



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

BREAK-IN LATERAL CONNECTION

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S20

DELETED



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SANITARY SEWER STREAM CROSSING

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S21

PREPARED BY

-

CHECKED BY

-

APPROVED BY

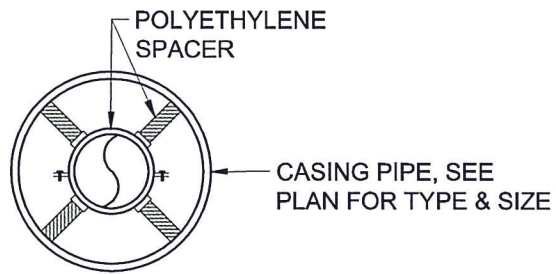
-

REV. / DATE

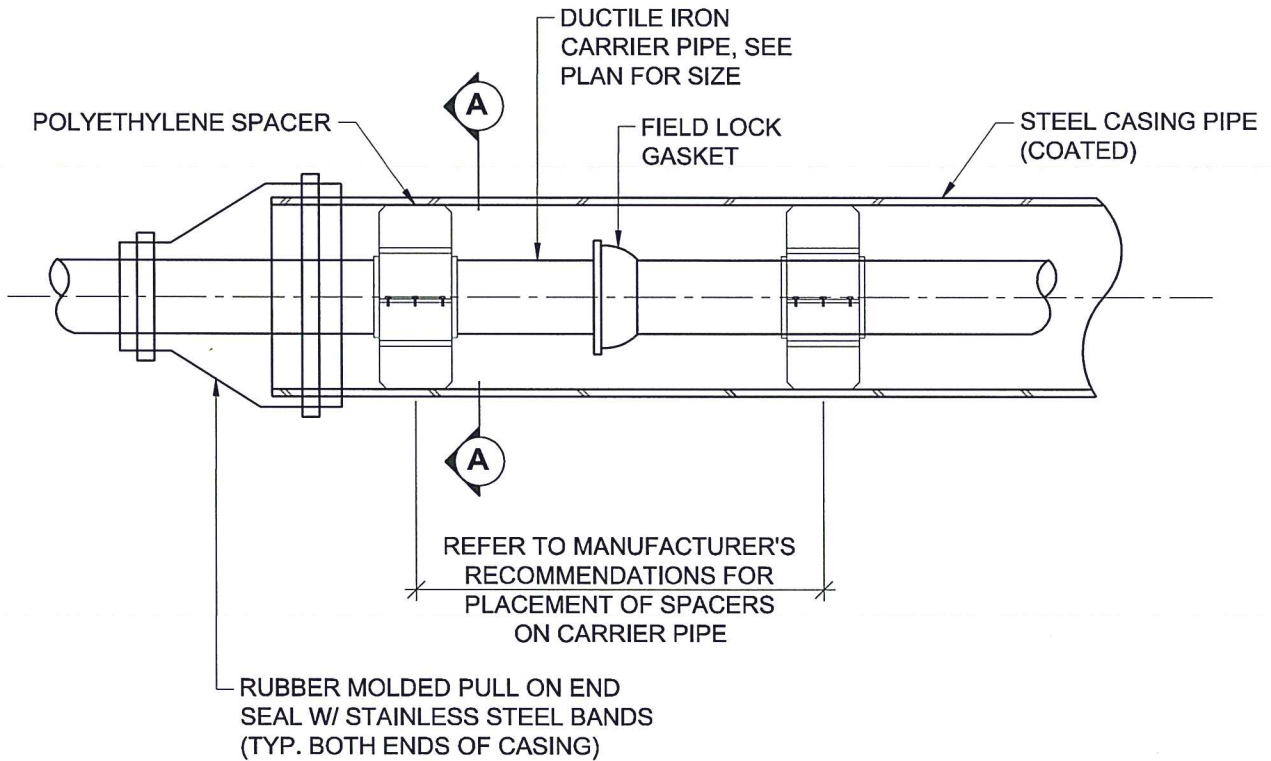
- -

PROJECT NO.

4185.001



SECTION A-A



CASING NOTES:

1. CASING PIPE TO BE 2 TIMES DIAMETER OF CARRIER PIPE.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SEWER MAIN PIPE CASING

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S22

DELETED



WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SEWER CROSSING OVER EXISTING WATER MAIN

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S23

PREPARED BY

-

CHECKED BY

-

APPROVED BY

-

REV. / DATE

- -

PROJECT NO.

4185.001

DELETED



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

SEWER CROSSING UNDER EXISTING WATER MAIN

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S24

PREPARED BY

CHECKED BY

APPROVED BY

REV. / DATE

PROJECT NO.

4185.001

DELETED



WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

GREASE TRAP

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S25

PREPARED BY

-

CHECKED BY

-

APPROVED BY

-

REV. / DATE

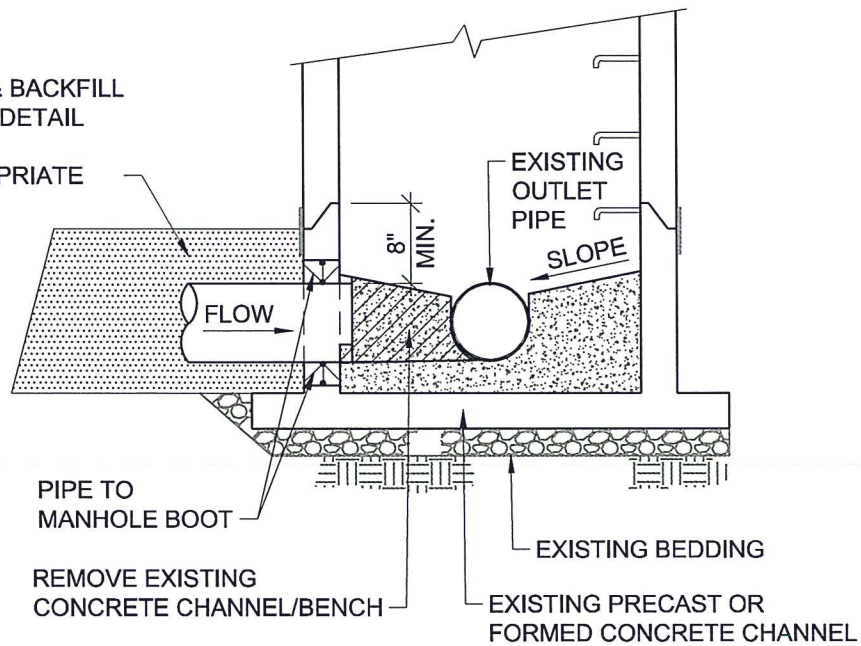
-

-

PROJECT NO.

4185.001

BEDDING & BACKFILL
REFER TO DETAIL
S1 OR S2
AS APPROPRIATE



NOTES:

1. REMOVE EXISTING CONCRETE CHANNEL & BENCH TO ACCOMMODATE THE NEW PIPE PENETRATION.
2. CORE DRILL MANHOLE TO DIAMETER FOR NEW PIPE PENETRATION.
3. INLET PIPE INVERTS SHALL BE A MINIMUM OF 0.10 FEET HIGHER THAN OUTLET PIPE INVERT.
4. INSTALL GASKET & SEWER MAIN PER MANUFACTURER INSTRUCTIONS.
5. REFORM CONCRETE CHANNEL TO PROVIDE SMOOTH FLOW TO MANHOLE OUTLET.
6. SEAL INTERIOR PIPE PENETRATION WITH NON SHRINK GROUT.
7. A FULL PIPE LENGTH SHALL BE INSTALLED FROM THE MANHOLE CONNECTION TO THE FIRST PIPE JOINT.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

EXISTING MANHOLE PENETRATION

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

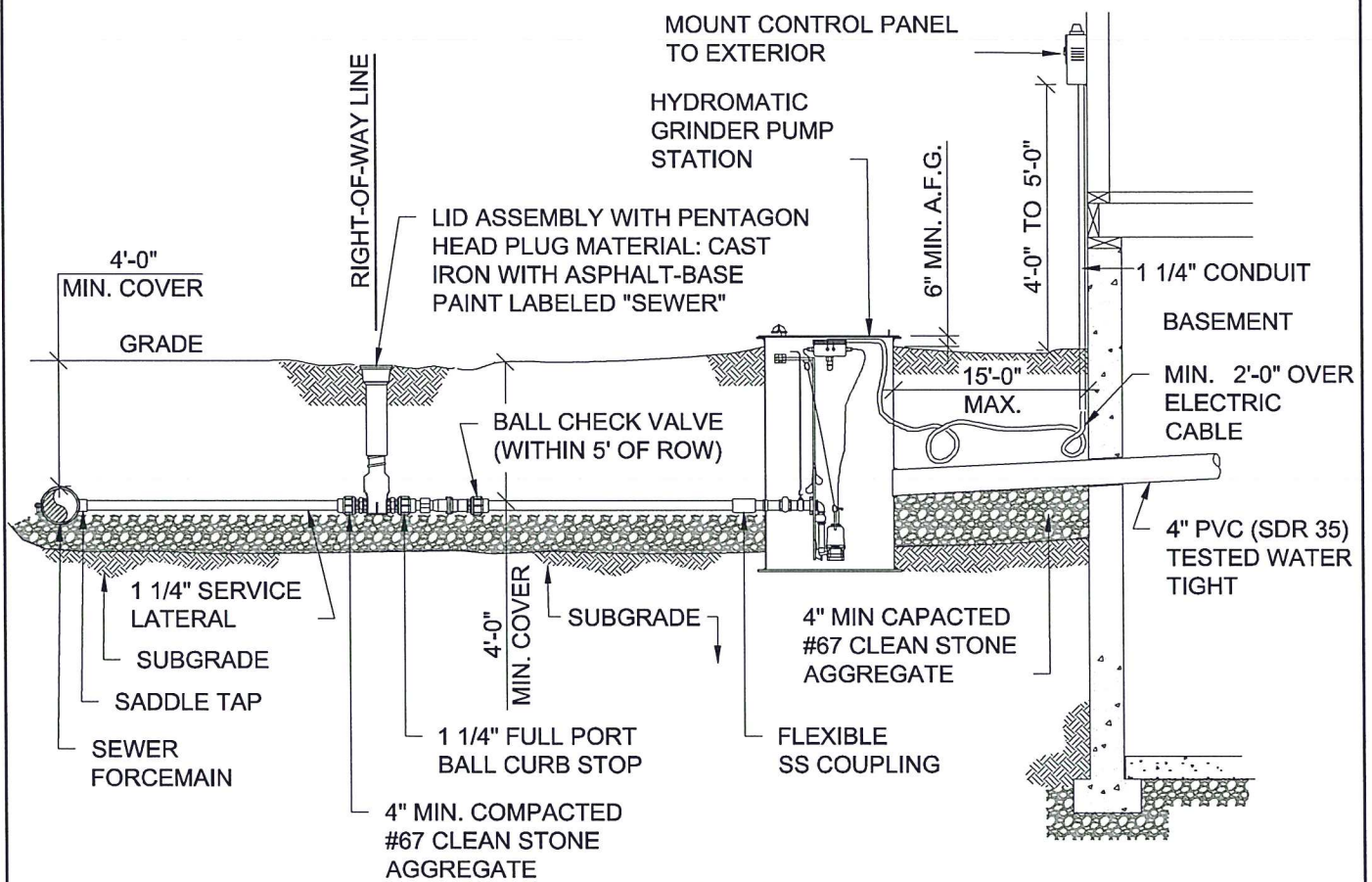
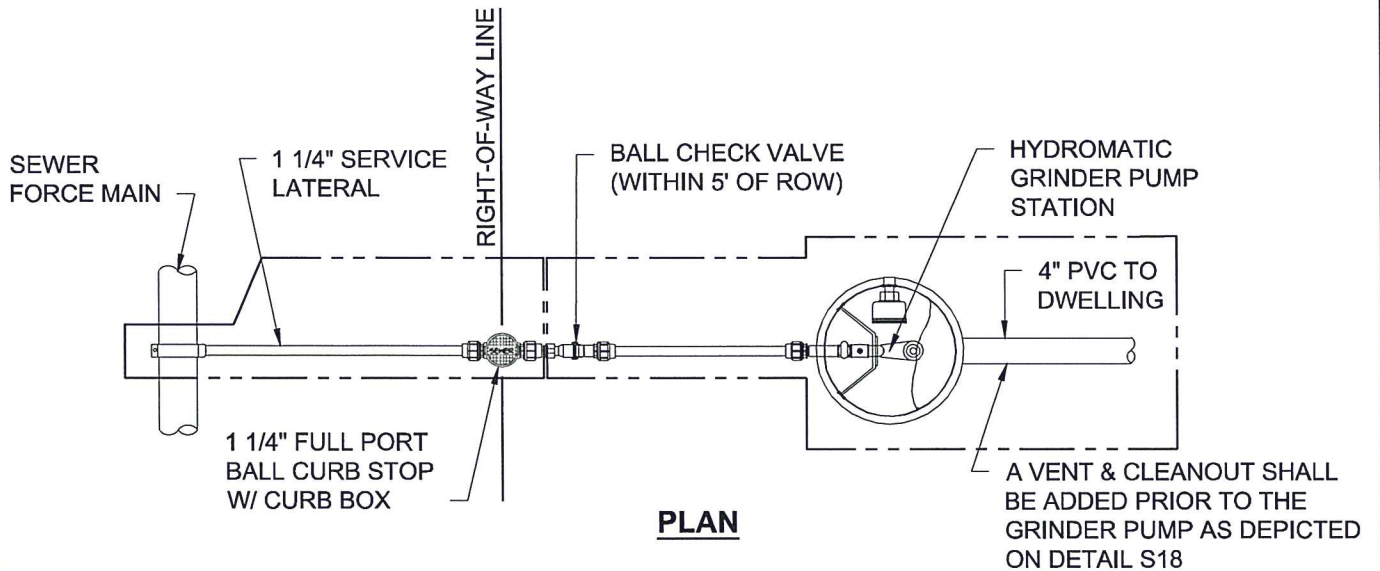
CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S27



NOTES

1. REFER TO DRAWING S-3 FOR LATERAL NOTES.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

GRINDER PUMP CONNECTING TO FORCEMAIN

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

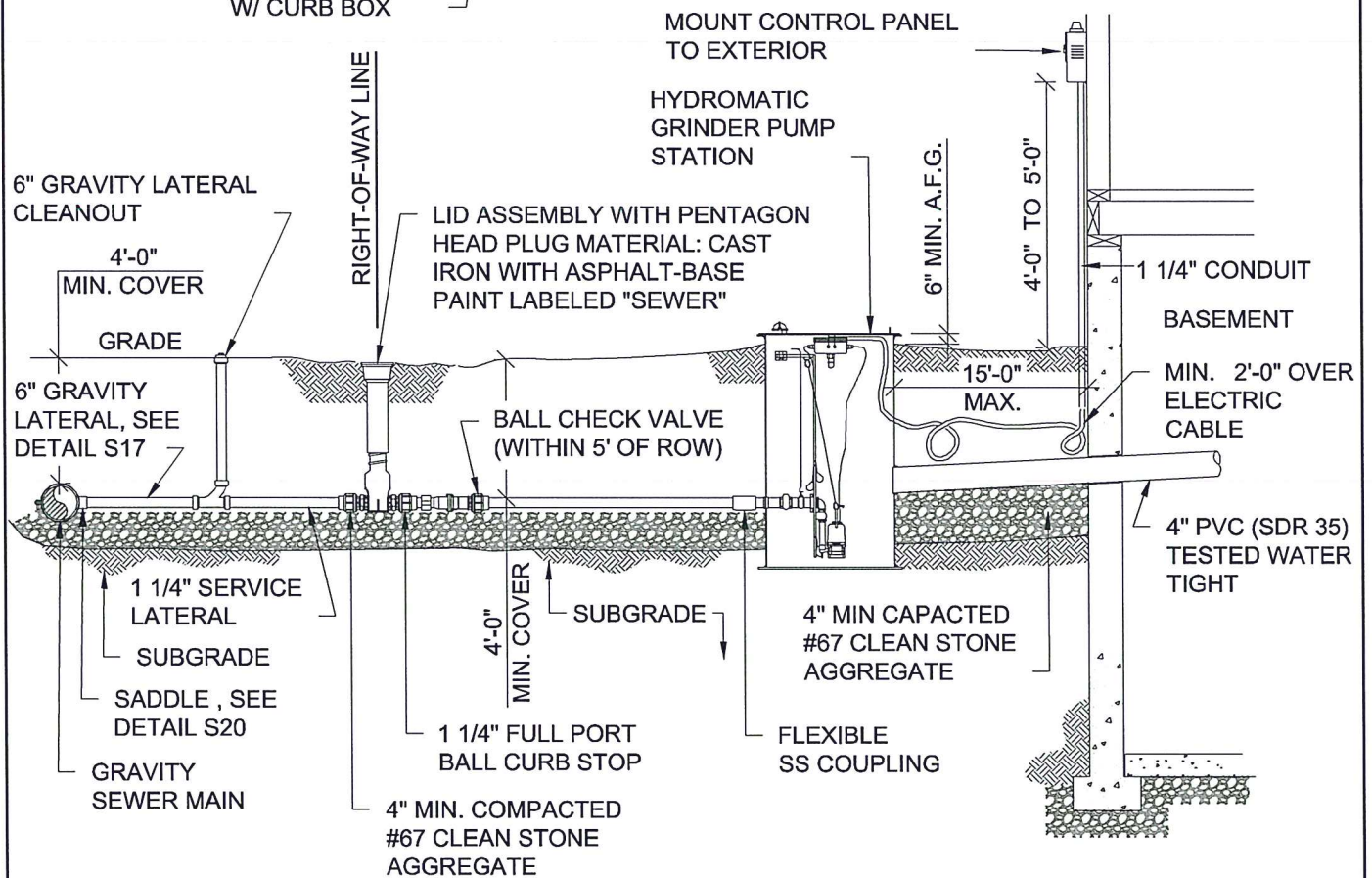
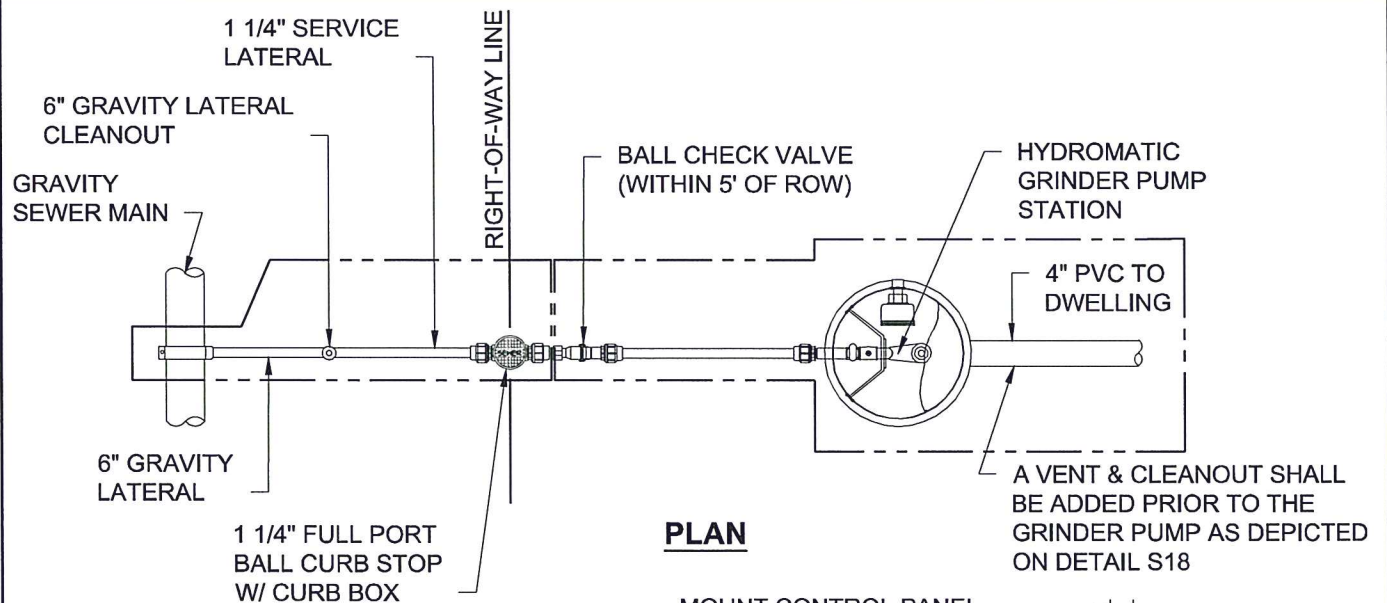
PROJECT NO.
4185.001

S28A

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER



NOTES

1. REFER TO DRAWING S-3 FOR LATERAL NOTES.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

GRINDER PUMP CONNECTING TO GRAVITY MAIN

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

REV. / DATE
- -

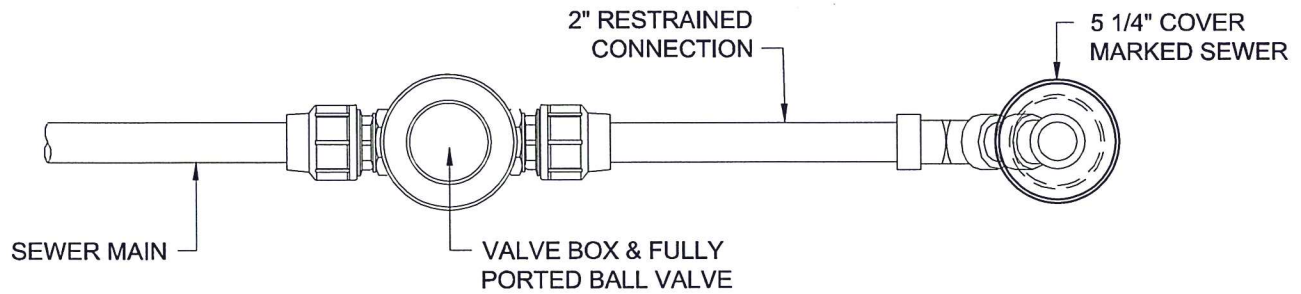
PROJECT NO.
4185.001

S28B

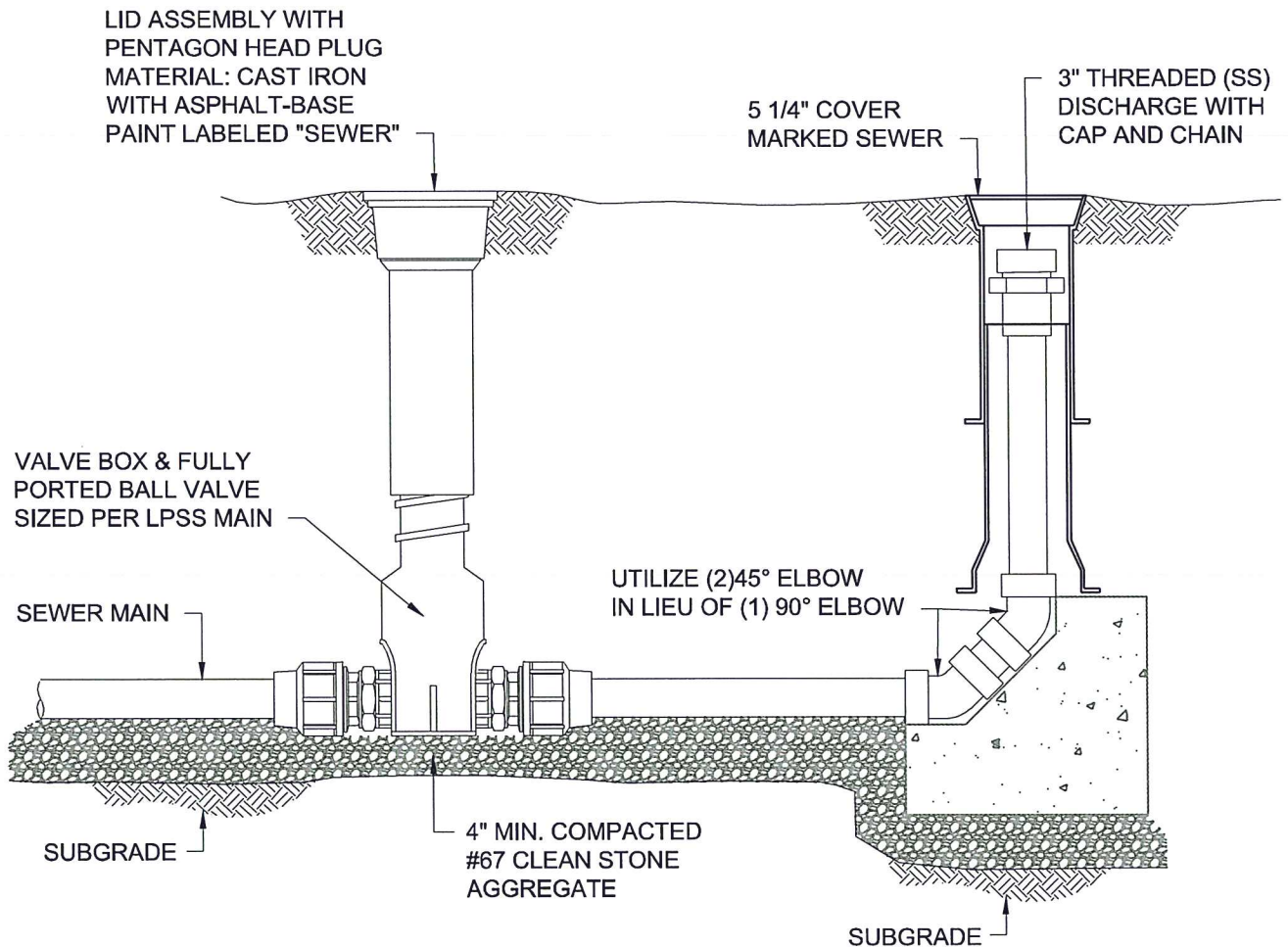
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER



PLAN



ELEVATION



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

TERMINAL CLEANOUT ASSEMBLY

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

S29

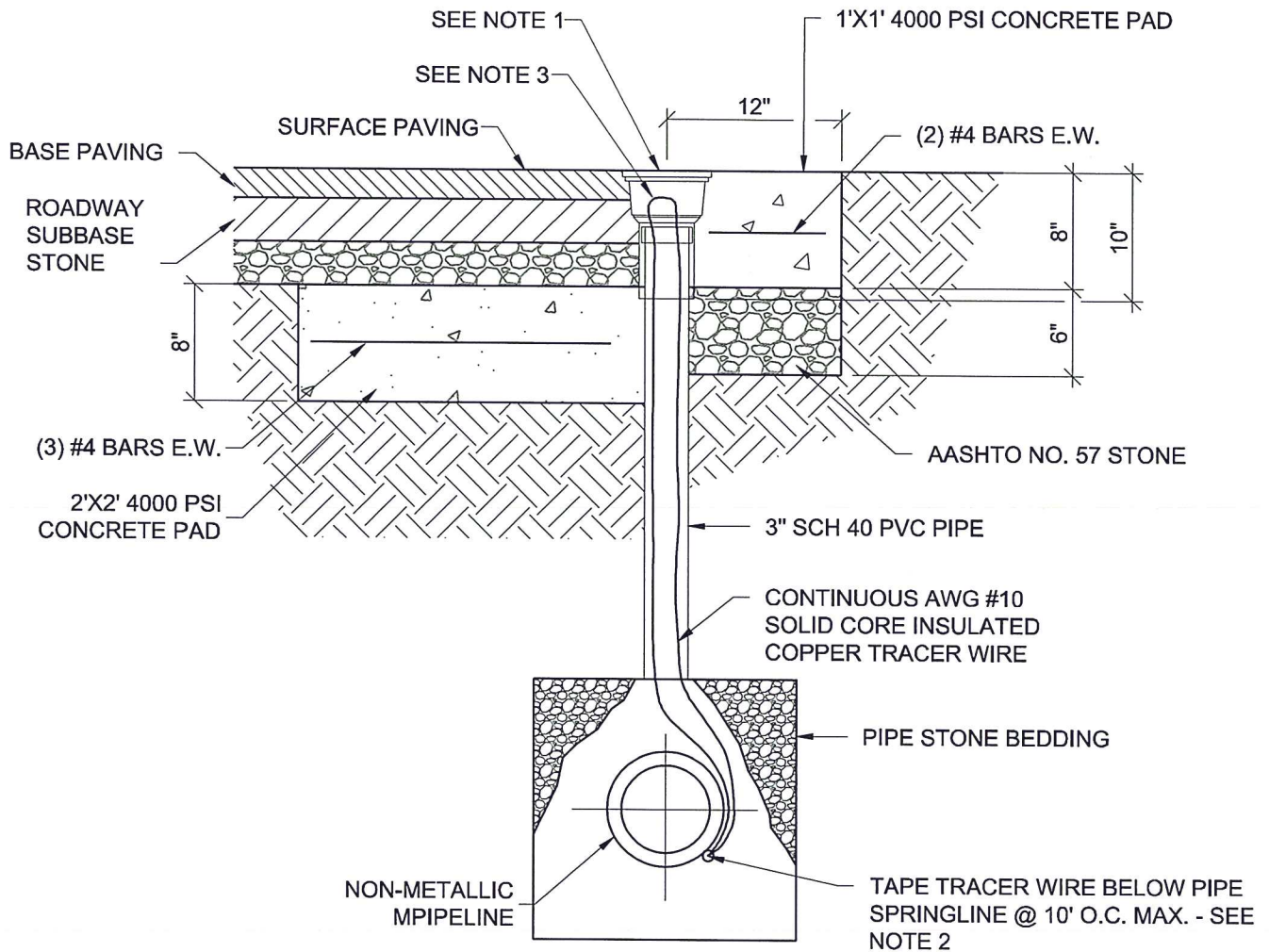
PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001



ELEVATION

NOTES

1. C.I. BOX SHALL BE TYLER 10" C.I. VALVE BOX TOP SECTION SLIP MODEL 10T-A WITH 5 1/4" DROP LID MODEL 14549 MARKED "SEWER"
2. DO NOT SPLICE TRACER WIRE UNDERGROUND.
3. PROVIDE 3 FEET OF LOOPED WIRE WITHIN TEST STATION BOX.
4. SPACE TEST STATIONS 500 FEET MAX. AND AT ALL CHANGES IN FORCE MAIN DIRECTIONS.
5. PROVIDE METALLIC CAUTION TAPE CENTERED ON FORCE MAIN 12" BELOW FINISHED GRADE.



1.800.825.1372
www.entecheng.com

WARWICK TOWNSHIP MUNICIPAL AUTHORITY

315 CLAY ROAD, LITITZ, PA 17543

STANDARD DETAIL

FORCE MAIN TRACER WIRE TEST STATION

DATE:
MARCH 2020

SCALE:
N.T.S.

DRAWING NO.

PREPARED BY
CAD

CHECKED BY
TAL

APPROVED BY
SER

REV. / DATE
- -

PROJECT NO.
4185.001

S30