

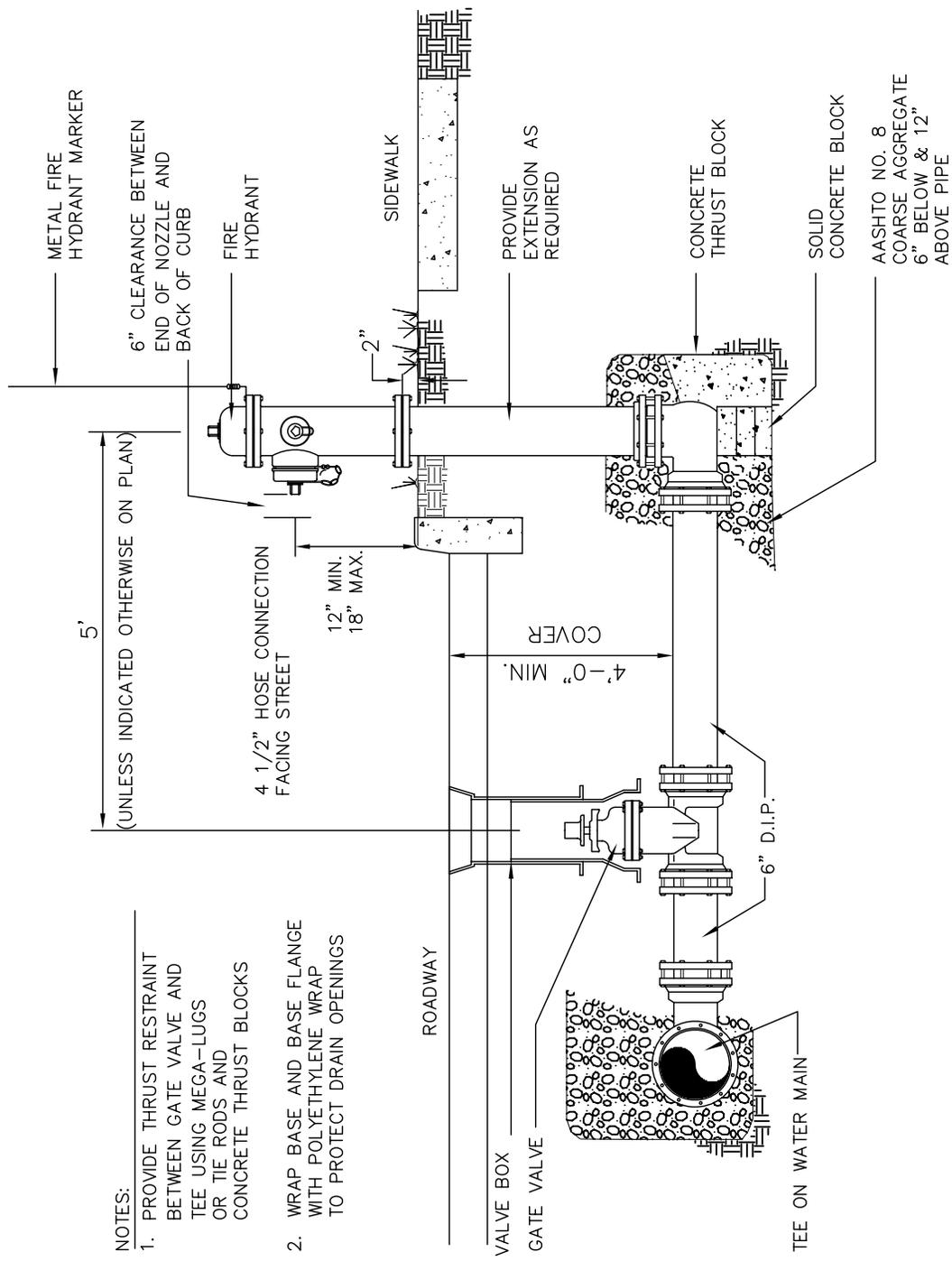
TEMPORARY PERMANENT

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.

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>TRENCH RESTORATION DETAIL FOR EXISTING PAVED AREAS</b>			
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  www.entecheng.com 1.800.825.1372	DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>	DRAWING NO. <div style="font-size: 2em; font-weight: bold; text-align: center;">W1</div>	
PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>	REV. / DATE - -	PROJECT NO. <b>4185.26</b>	





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 Engineering Architecture Construction

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Pottsville, PA ph: 570.628.5655  
 Mountaintop, PA ph: 570.868.0275  
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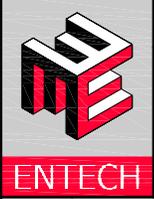
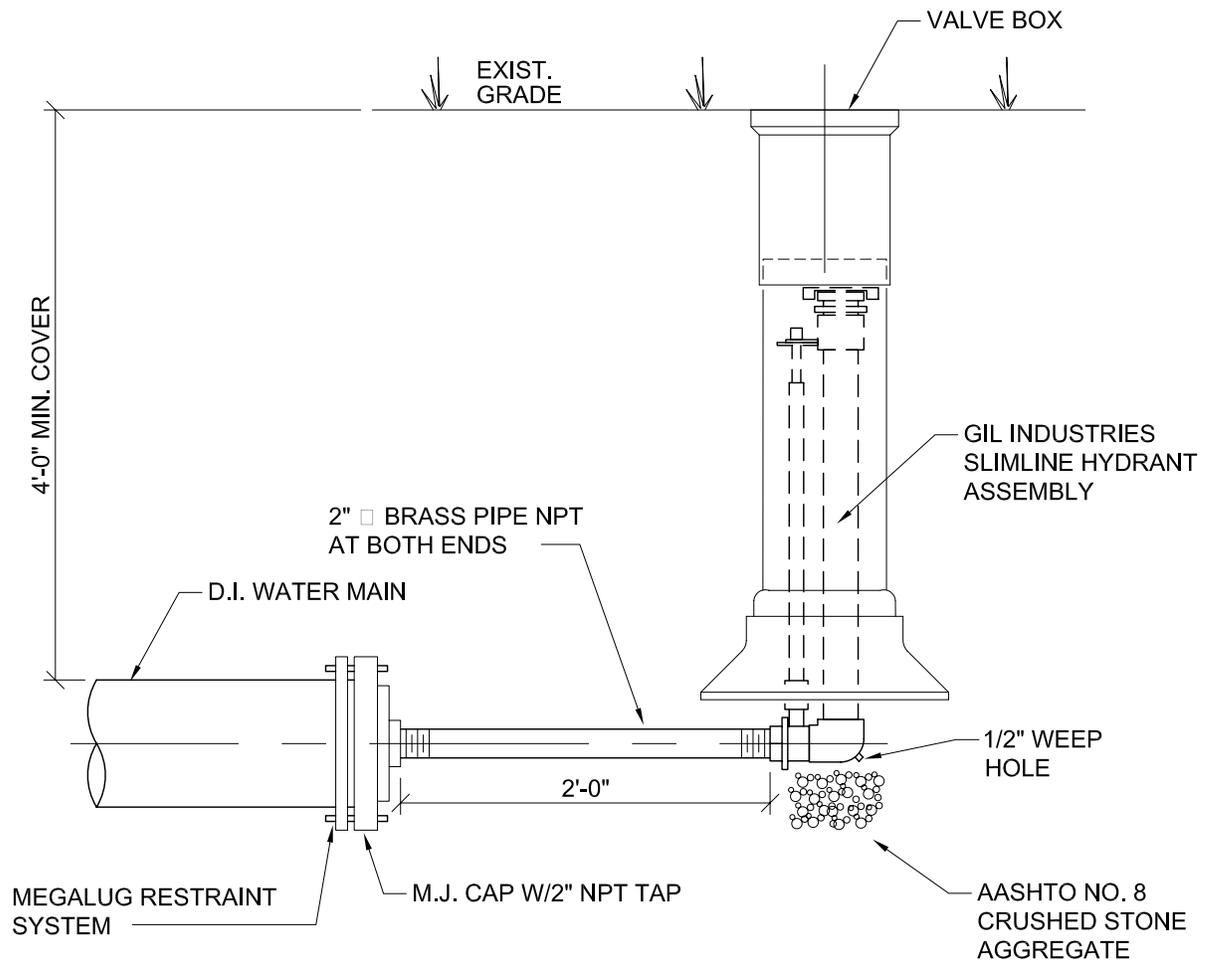
www.entecheng.com 1.800.825.1372

**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**  
 315 CLAY ROAD, LITITZ, PA 17543  
**STANDARD DETAIL**  
**FIRE HYDRANT ASSEMBLY DETAIL**

DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>	DRAWING NO.
REV. / DATE - / -	PROJECT NO. <b>4185.26</b>	

PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>
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**W11**



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**BLOW-OFF DETAIL**

PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**

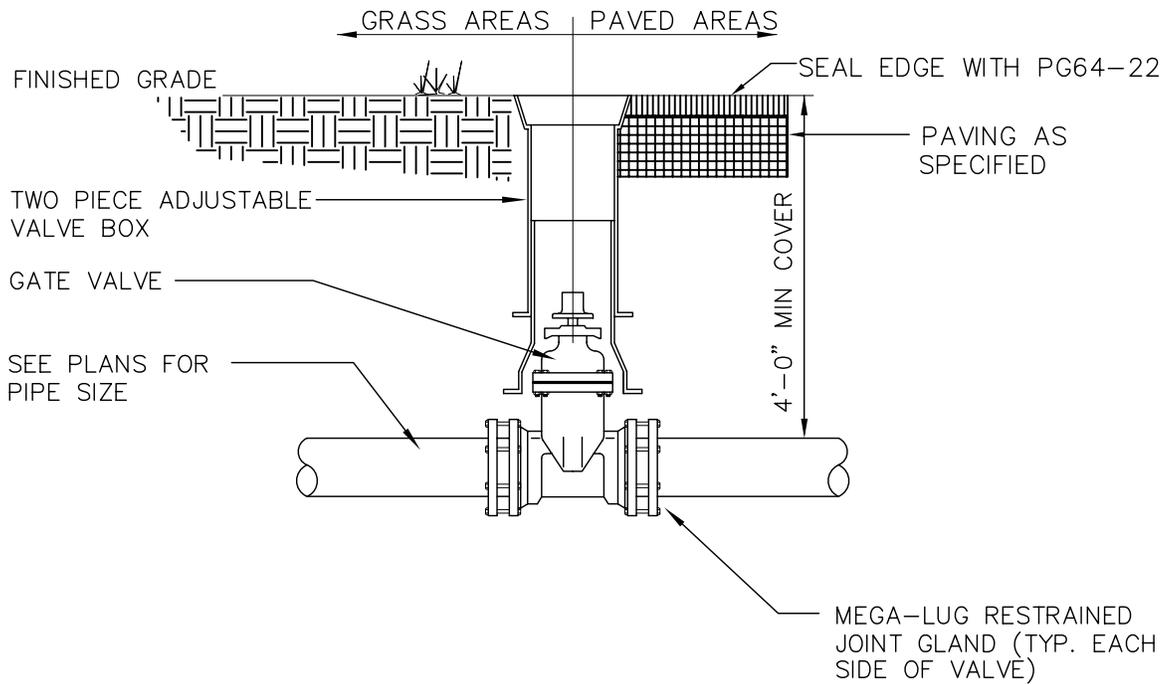
DATE:  
**APRIL 2009**

SCALE:  
**N.T.S.**

DRAWING NO.  
**W12**

REV. / DATE  
- -

PROJECT NO.  
**4185.26**



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Mountaintop, PA ph: 570.868.0275  
Lititz, PA ph: 717.626.6666

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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**BURIED GATE VALVE & VALVE BOX DETAIL**

DATE:  
**APRIL 2009**

SCALE:  
**N.T.S.**

DRAWING NO.

REV. / DATE  
- -

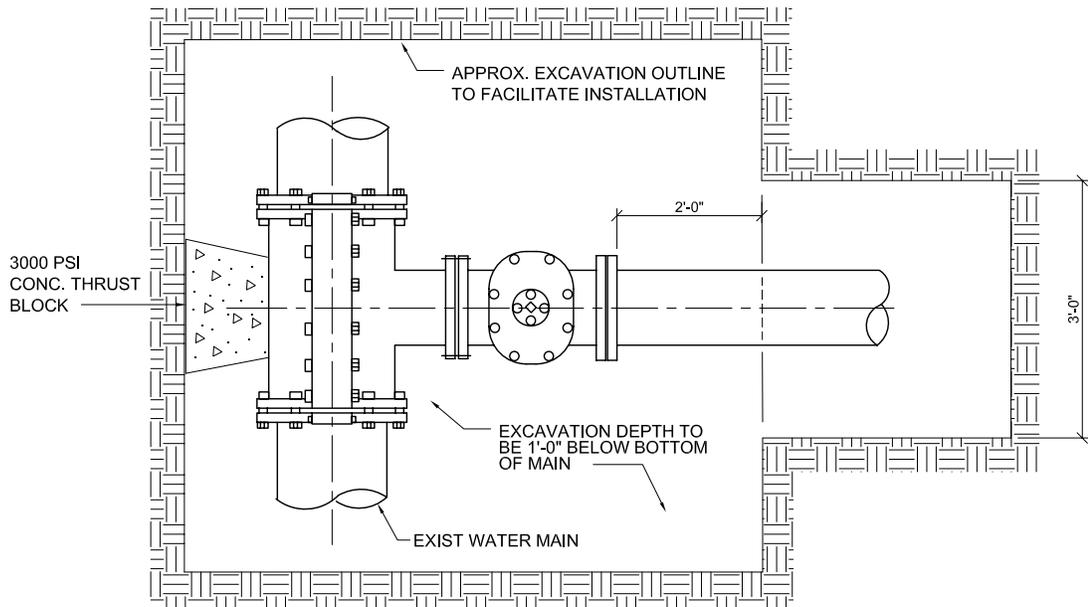
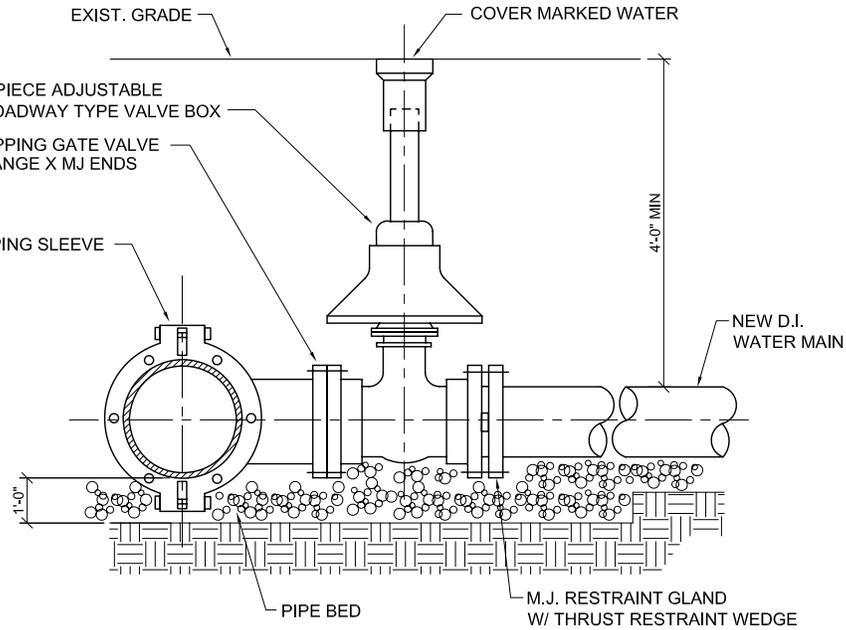
PROJECT NO.  
**4185.26**

**W13**

PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**



**ENTECH**

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Engineering Architecture Construction

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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**TAPPING SLEEVE & GATE VALVE TRENCH DETAIL**

DATE:  
**APRIL 2009**

SCALE:  
**N.T.S.**

DRAWING NO.

REV. / DATE  
- -

PROJECT NO.  
**4185.26**

**W14**

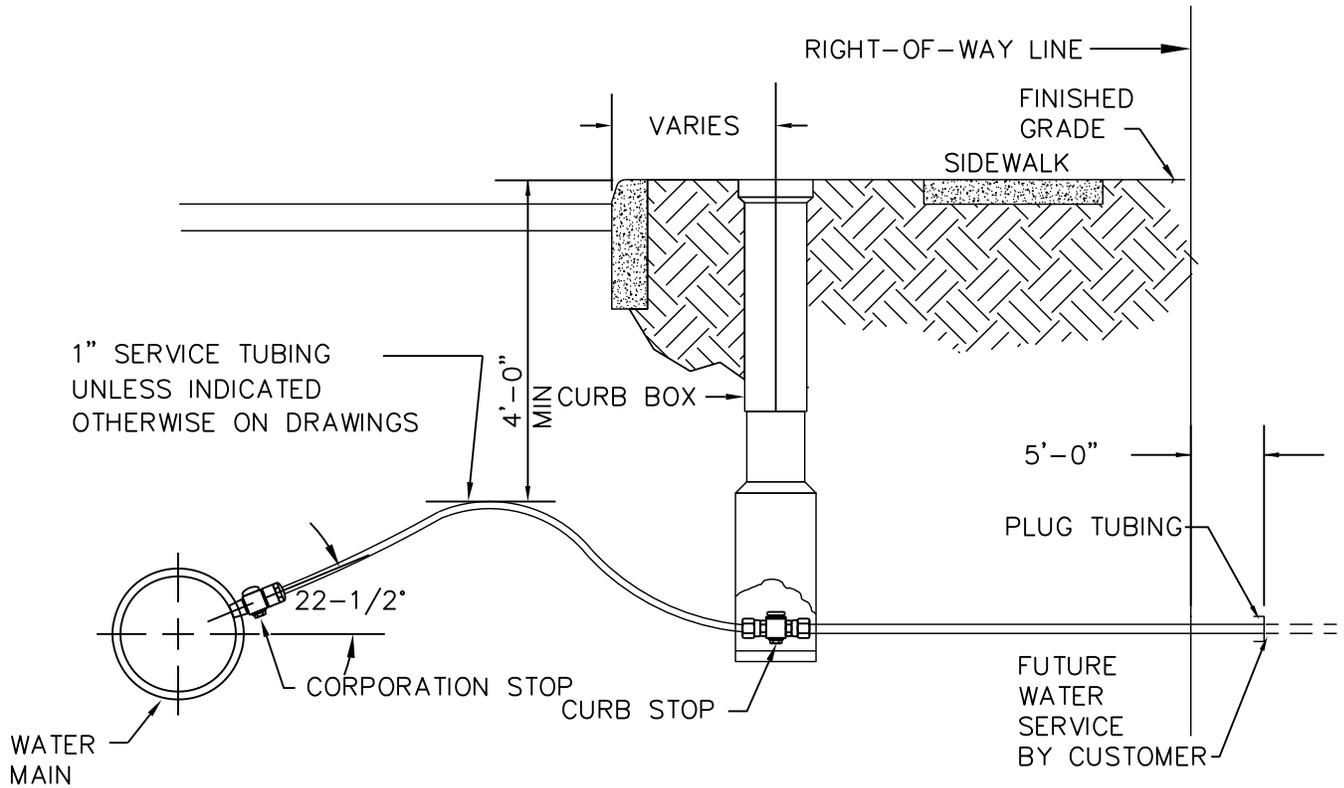
PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**

SERVICE LINE NOTES

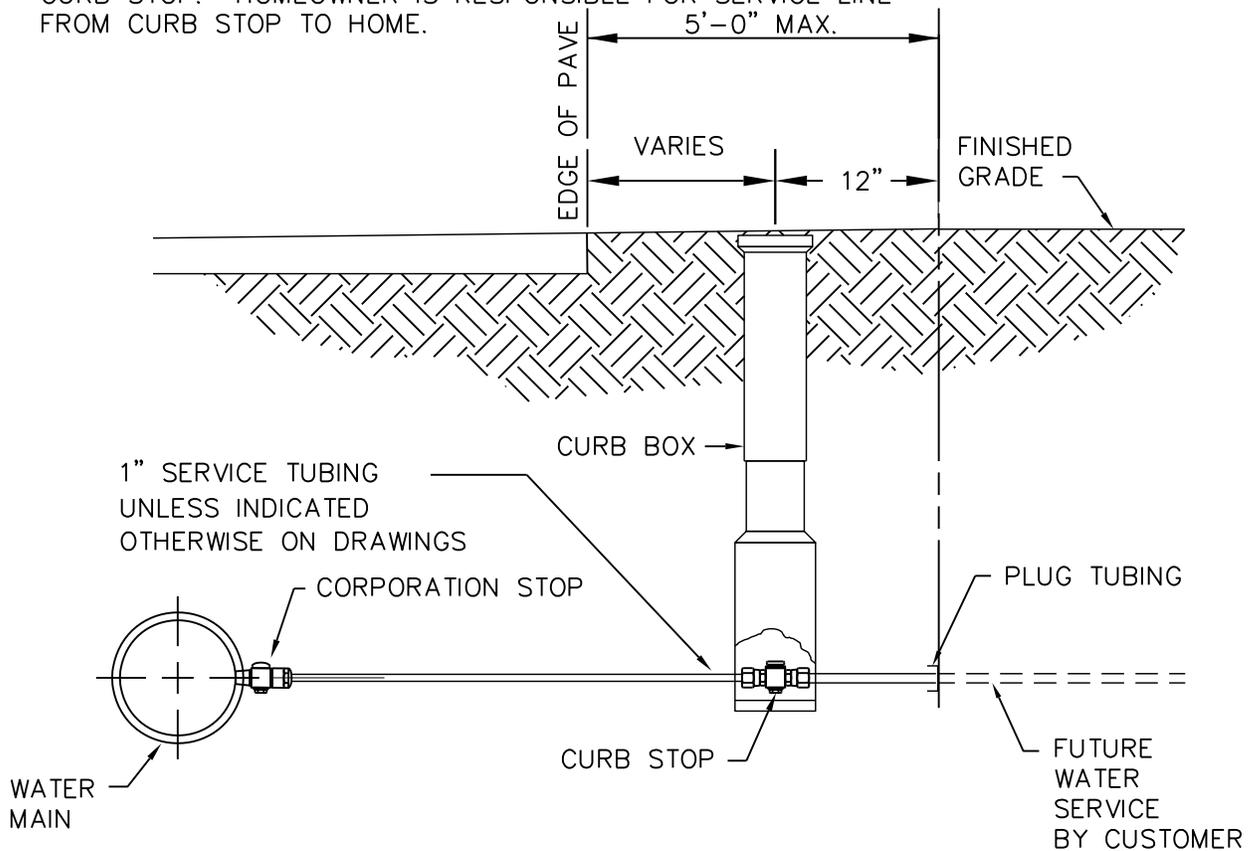
1. BED COPPER SERVICE TUBING 6" BELOW AND 12" ABOVE WITH PADOT TYPE "A" CONCRETE CEMENT SAND.
2. HIGH POINT OF SERVICE LINE SHALL BE 3 INCHES ABOVE TOP OF WATER MAIN
3. RESTORE EXISTING ROADS DISTURBED AS PART OF THIS WORK TO COMPLY WITH TOWNSHIP STANDARDS.
4. EXTEND SERVICE LINE TO 5 FEET BEYOND RIGHT-OF-WAY UNLESS A LESSER DISTANCE IS DIRECTED BY THE AUTHORITY
5. WTMA IS RESPONSIBLE FOR SERVICE LINE TO AND INCLUDING CURB STOP. HOMEOWNER IS RESPONSIBLE FOR SERVICE LINE FROM CURB STOP TO HOME.
6. IF NO SIDEWALK, WHETHER THERE IS CURB OR NOT, THE CURB STOP AND 1 FOOT STUB SHALL BE PLACED WITHIN A MAXIMUM DISTANCE OF 5 FEET FROM EDGE OF PAVE.



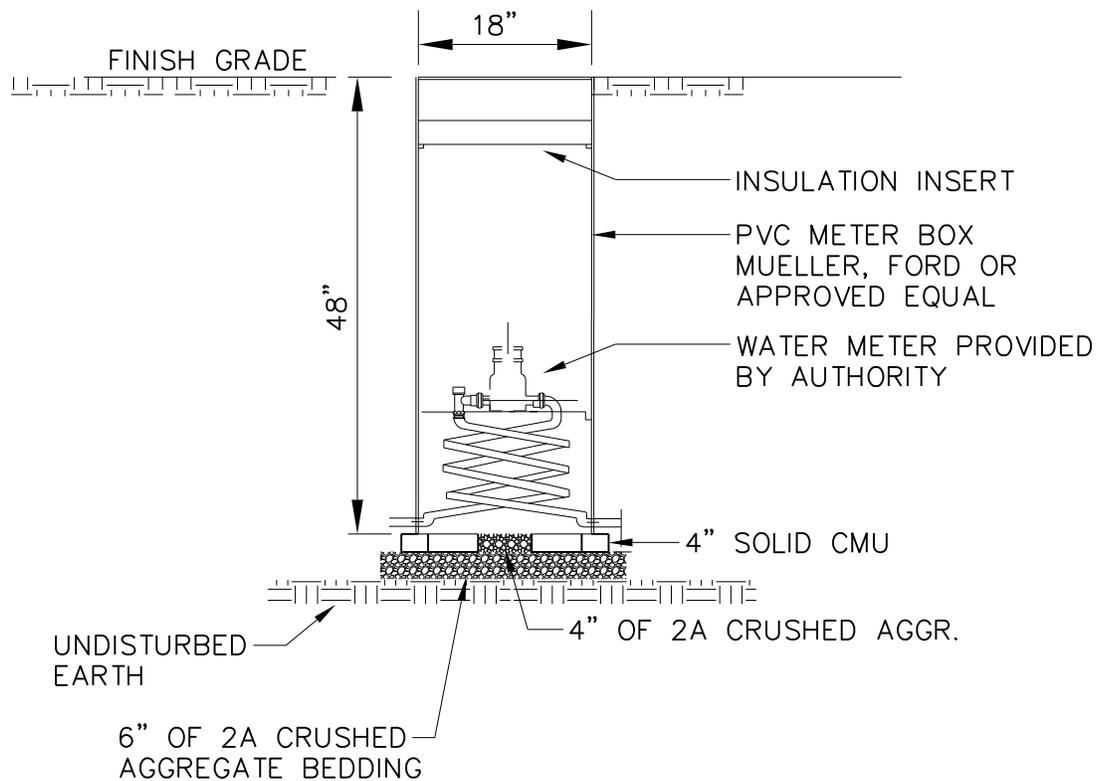
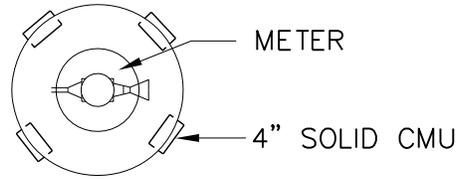
 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543					
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  <a href="http://www.entecheng.com">www.entecheng.com</a> 1.800.825.1372	<b>STANDARD DETAIL</b> <b>WATER SERVICE INSTALLATION DETAIL - COPPER LINE</b>					
PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">           DATE:  <b>APRIL 2009</b> </td> <td style="width: 50%;">           SCALE:  <b>N.T.S.</b> </td> </tr> <tr> <td style="width: 50%;">           REV. / DATE  <b>1 APRIL 2011</b> </td> <td style="width: 50%;">           PROJECT NO.  <b>4185.26</b> </td> </tr> </table>	DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>	REV. / DATE <b>1 APRIL 2011</b>	PROJECT NO. <b>4185.26</b>
DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>						
REV. / DATE <b>1 APRIL 2011</b>	PROJECT NO. <b>4185.26</b>						
			DRAWING NO.  <b>W15</b>				

SERVICE LINE NOTES

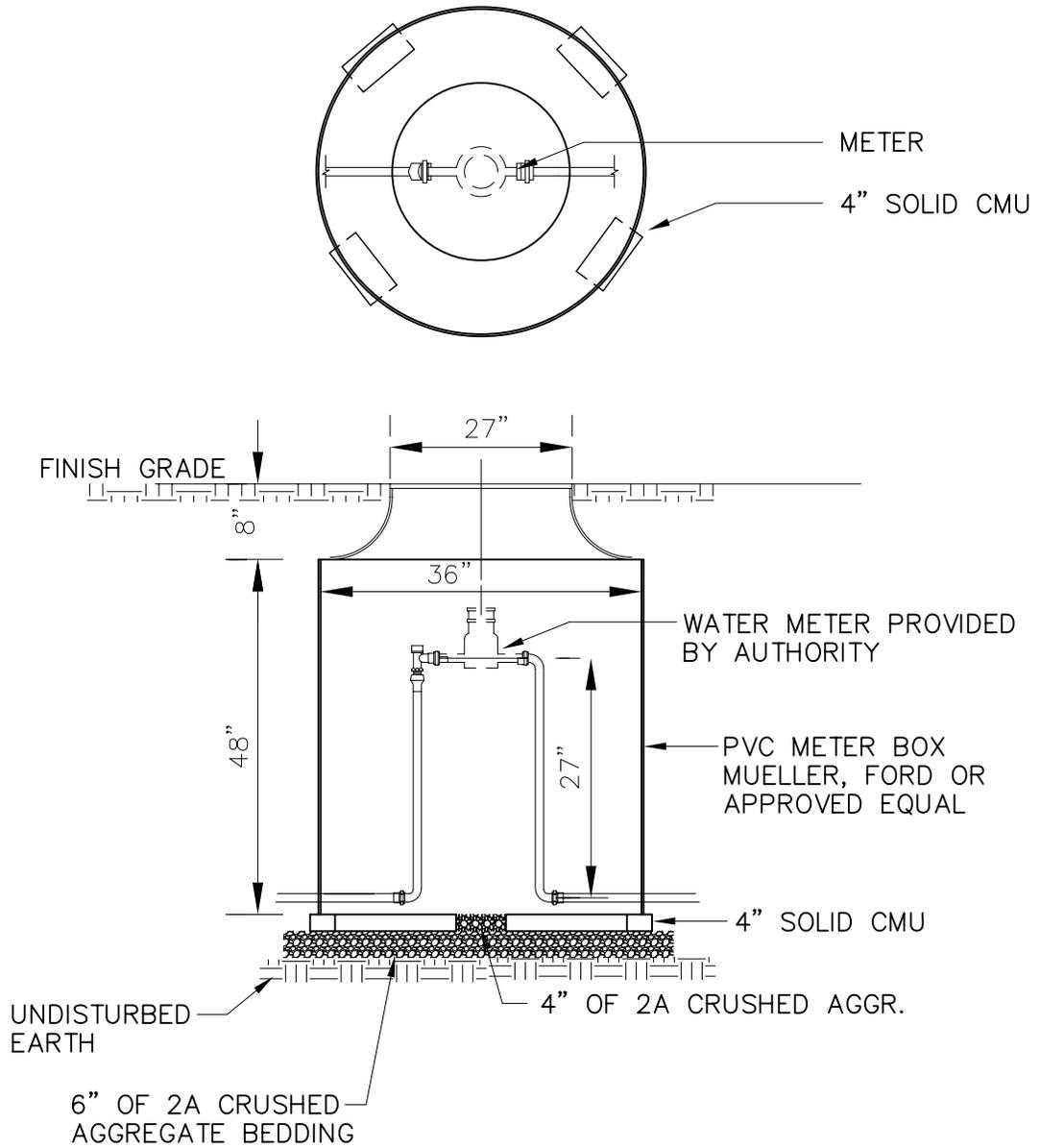
1. BED PE SERVICE TUBING 6" BELOW AND 12" ABOVE WITH PADOT TYPE "A" CONCRETE CEMENT SAND OR AASHTO NO. 10 FINE AGGREGATE
2. RESTORE EXISTING ROADS DISTURBED AS PART OF THIS WORK TO COMPLY WITH TOWNSHIP STANDARDS.
3. EXTEND SERVICE LINE TO 5 FEET BEYOND RIGHT-OF-WAY UNLESS A LESSER DISTANCE IS DIRECTED BY THE AUTHORITY
4. ALL CONDITIONS RELATED TO PLACEMENT WITH CURBS AND SIDEWALKS NOTED ON COPPER LINE DETAIL (W15) SHALL APPLY
5. PROVIDE UTILITY WARNING TAPE 1 FOOT BELOW GRADE AND TRACER WIRE ALONG SERVICE LINE FROM MAIN TO CURB STOP.
6. WTMA IS RESPONSIBLE FOR SERVICE LINE TO AND INCLUDING CURB STOP. HOMEOWNER IS RESPONSIBLE FOR SERVICE LINE FROM CURB STOP TO HOME.



 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  <a href="http://www.entecheng.com">www.entecheng.com</a> 1.800.825.1372	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>WATER SERVICE INSTALLATION DETAIL - PE LINE (W/O CURB AND SIDEWALK)</b>			
	PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>	DATE: <b>APRIL 2009</b>  REV. / DATE <b>1 APRIL 2011</b>	SCALE: <b>N.T.S.</b>  PROJECT NO. <b>4185.26</b>



	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction		<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543	
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537		<b>STANDARD DETAIL</b> <b>RESIDENTIAL WATER METER PIT - (1" SERVICE)</b>	
<b>ENTECH</b>	Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666		DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>
	www.entecheng.com 1.800.825.1372	DRAWING NO. <b>W17</b>	REV. / DATE <b>1 APRIL 2011</b>	PROJECT NO. <b>4185.26</b>
PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>		



**ENTECH**

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Engineering Architecture Construction

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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**RESIDENTIAL WATER METER PIT - (1 1/2" AND 2" SERVICE)**

DATE:  
**APRIL 2009**

SCALE:  
**N.T.S.**

DRAWING NO.

REV. / DATE  
- -

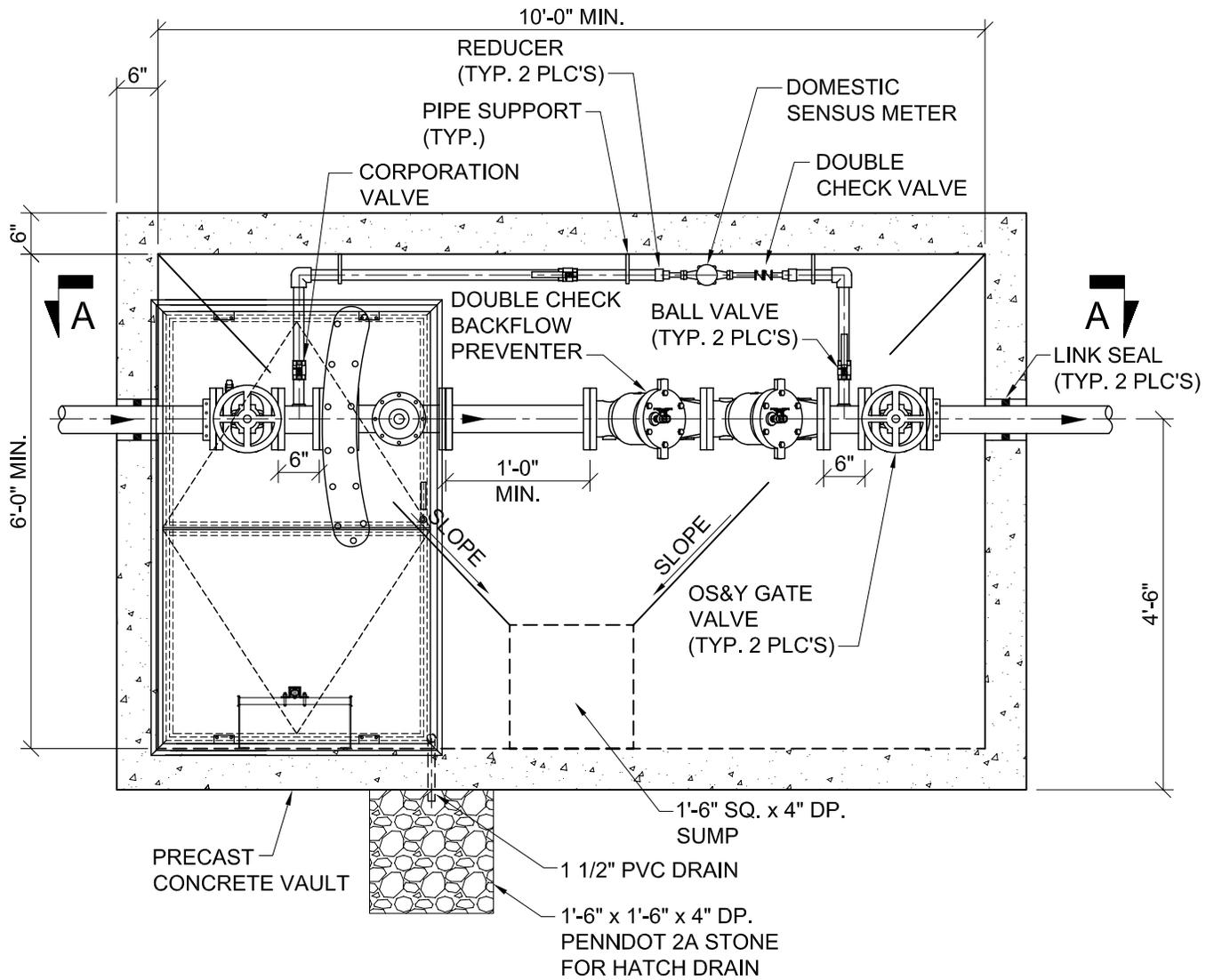
PROJECT NO.  
**4185.26**

**W18**

PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**



**PLAN**



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Engineering Architecture Construction

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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**FIRE METER PIT - LOW DOMESTIC USE**

**ENTECH**

PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**

DATE:  
**APRIL 2009**

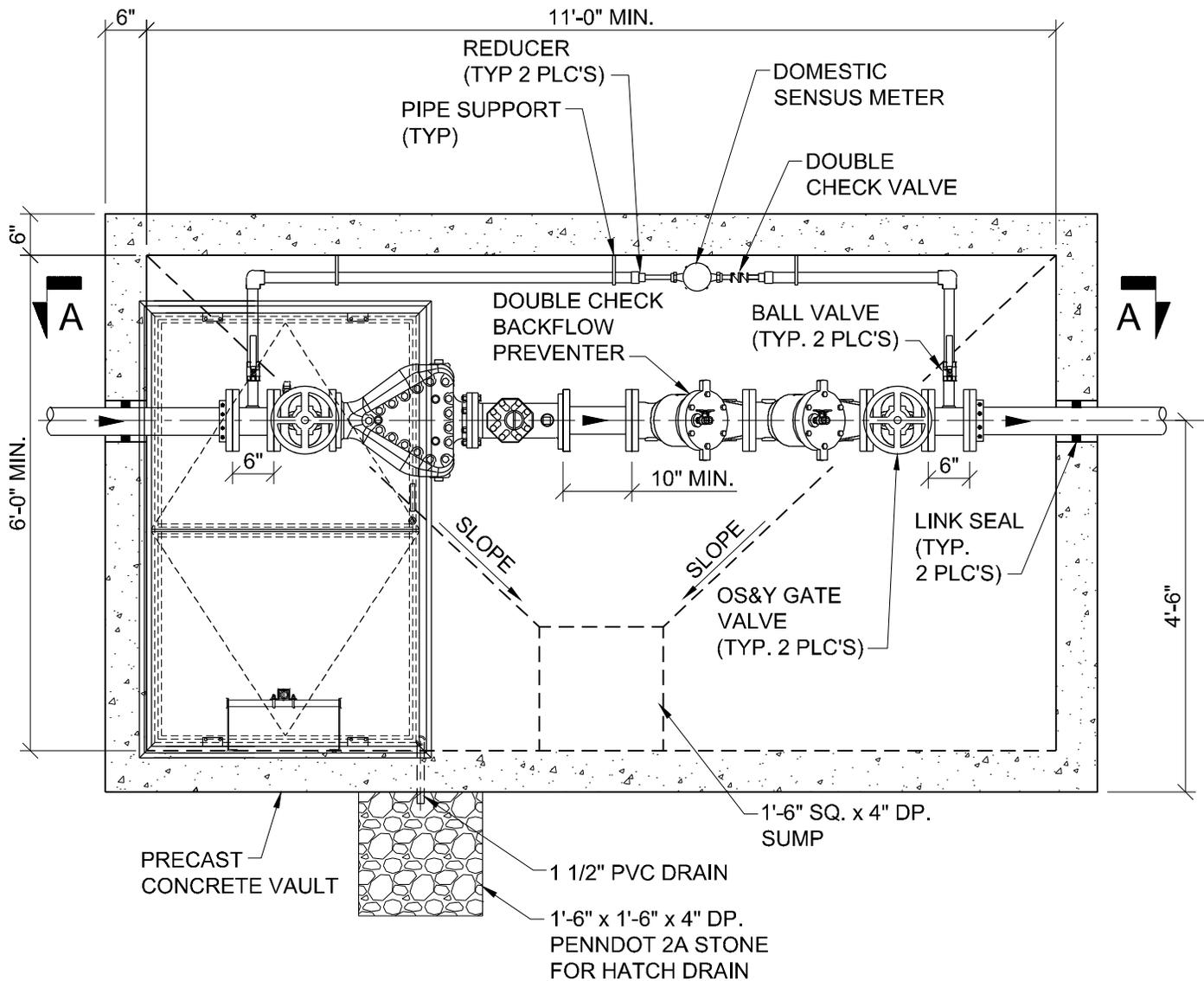
SCALE:  
**N.T.S.**

DRAWING NO.

REV. / DATE  
- -

PROJECT NO.  
**4185.26**

**W19 (1 of 2)**

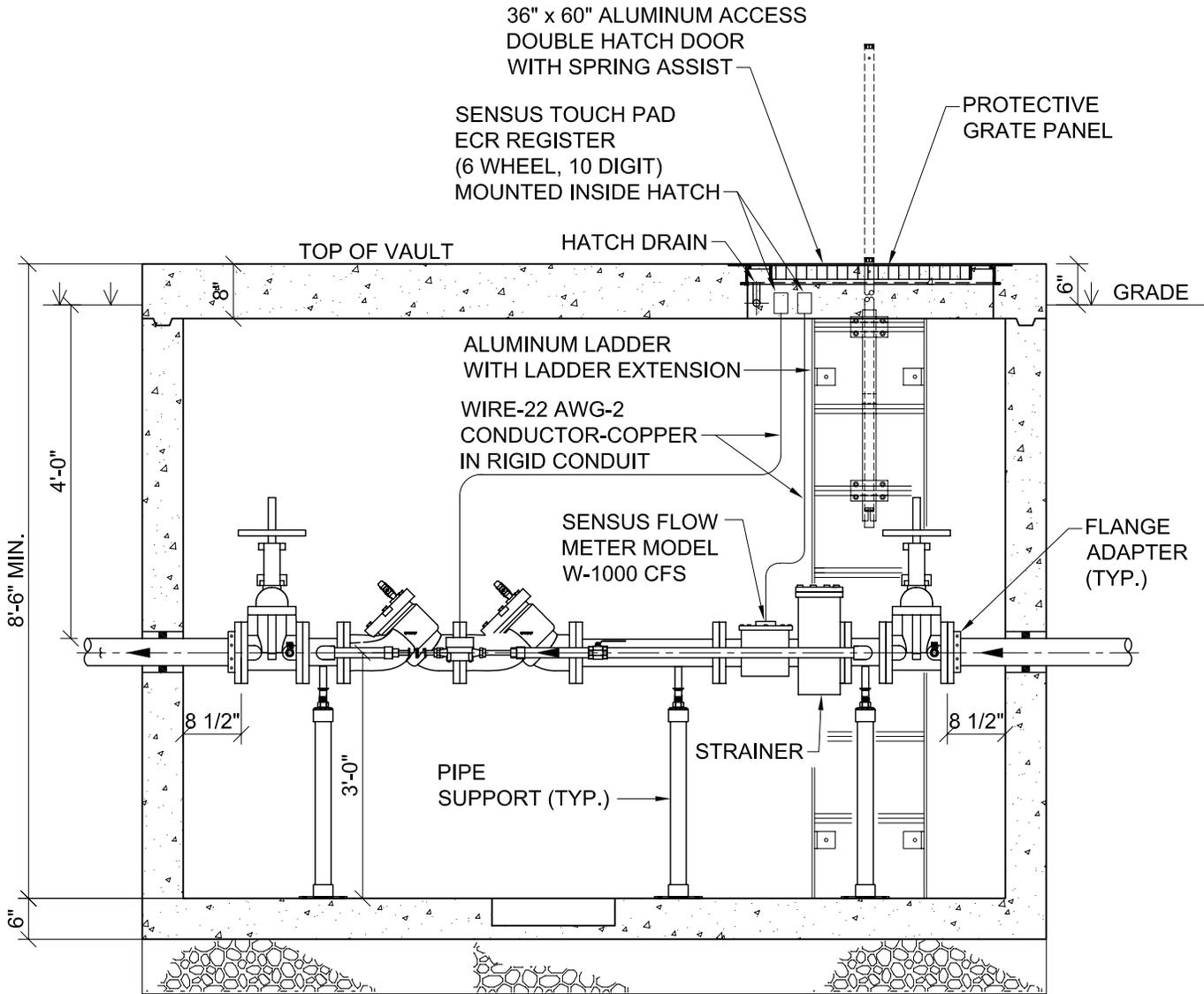


### PLAN

**NOTES:**

1. BYPASS LINE SHALL BE SIZED TO SUPPLY DOMESTIC FLOW WHEN PRIMARY FLOW METER OR ASSOCIATED COMPONENTS REQUIRE SERVICE.
2. FLOW METERS SHALL BE INSTALLED WITH THE MANUFACTURER'S RECOMMENDED STRAIGHT RUNS OF PIPE UP STREAM AND DOWN STREAM OF THE METER ASSEMBLY.

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  www.entecheng.com 1.800.825.1372	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>COMBINATION DOMESTIC &amp; FIRE METER PIT</b>			
	PREPARED BY <b>MAL</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SER</b>	DATE: <b>APRIL 2009</b>  REV. / DATE <b>1 AUG. 2013</b>	SCALE: <b>N.T.S.</b>  PROJECT NO. <b>4185.26</b>

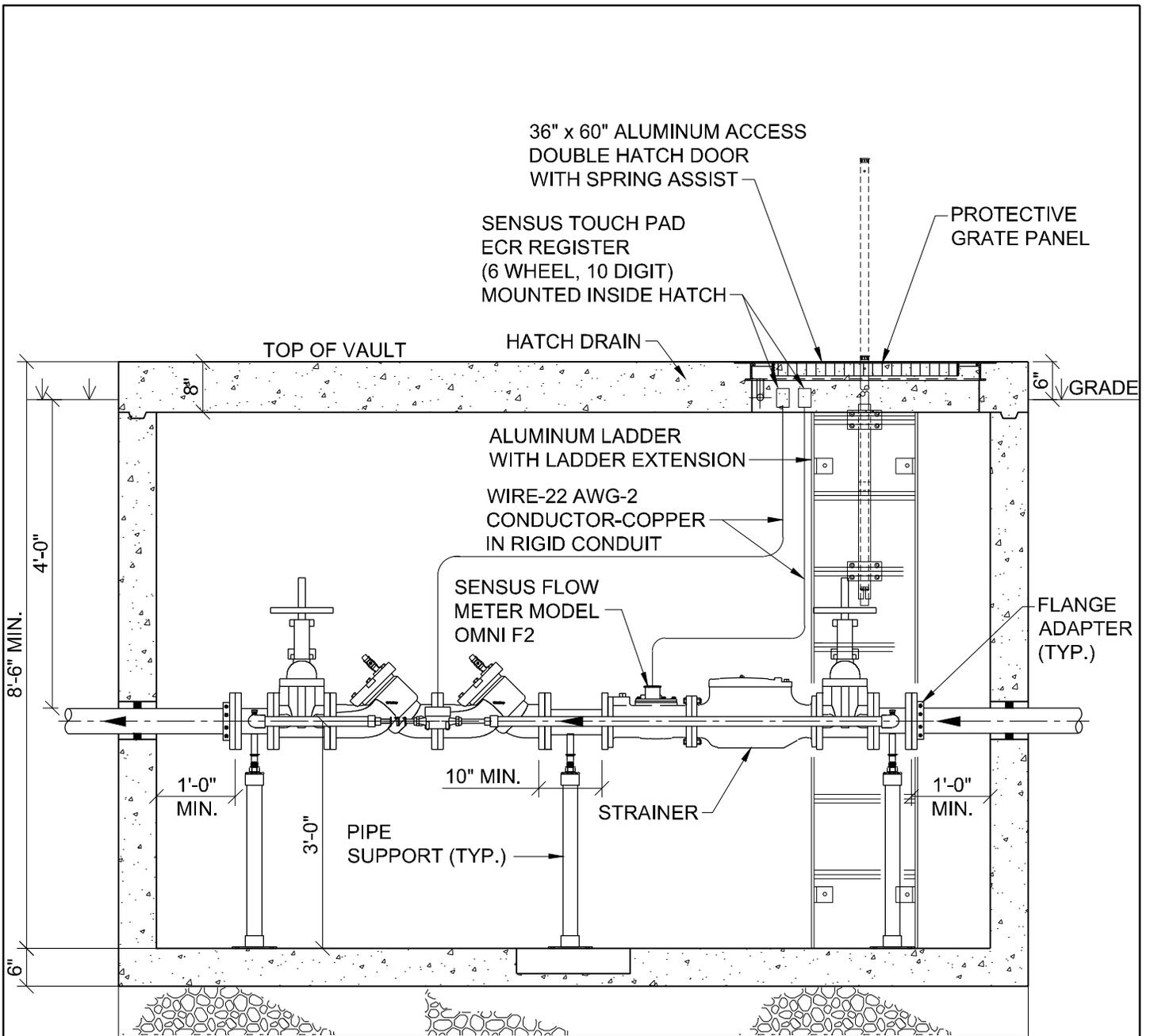


**NOTES:**

1. PRECAST CONCRETE ASSEMBLY SHALL CONTAIN XYPEX CONCRETE WATERPROOF ADMIXTURE.
2. RACEWAY LOCATED WITHIN VAULT SHALL BE SCHEDULE 80 EXTRA HEAVY PVC.

**SECTION A-A**

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>FIRE METER PIT - LOW DOMESTIC USE</b>		
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537	DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>	DRAWING NO.
	Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666 www.entecheng.com 1.800.825.1372	REV. / DATE - -	PROJECT NO. <b>4185.26</b>	<b>W19 (2 of 2)</b>
PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>		

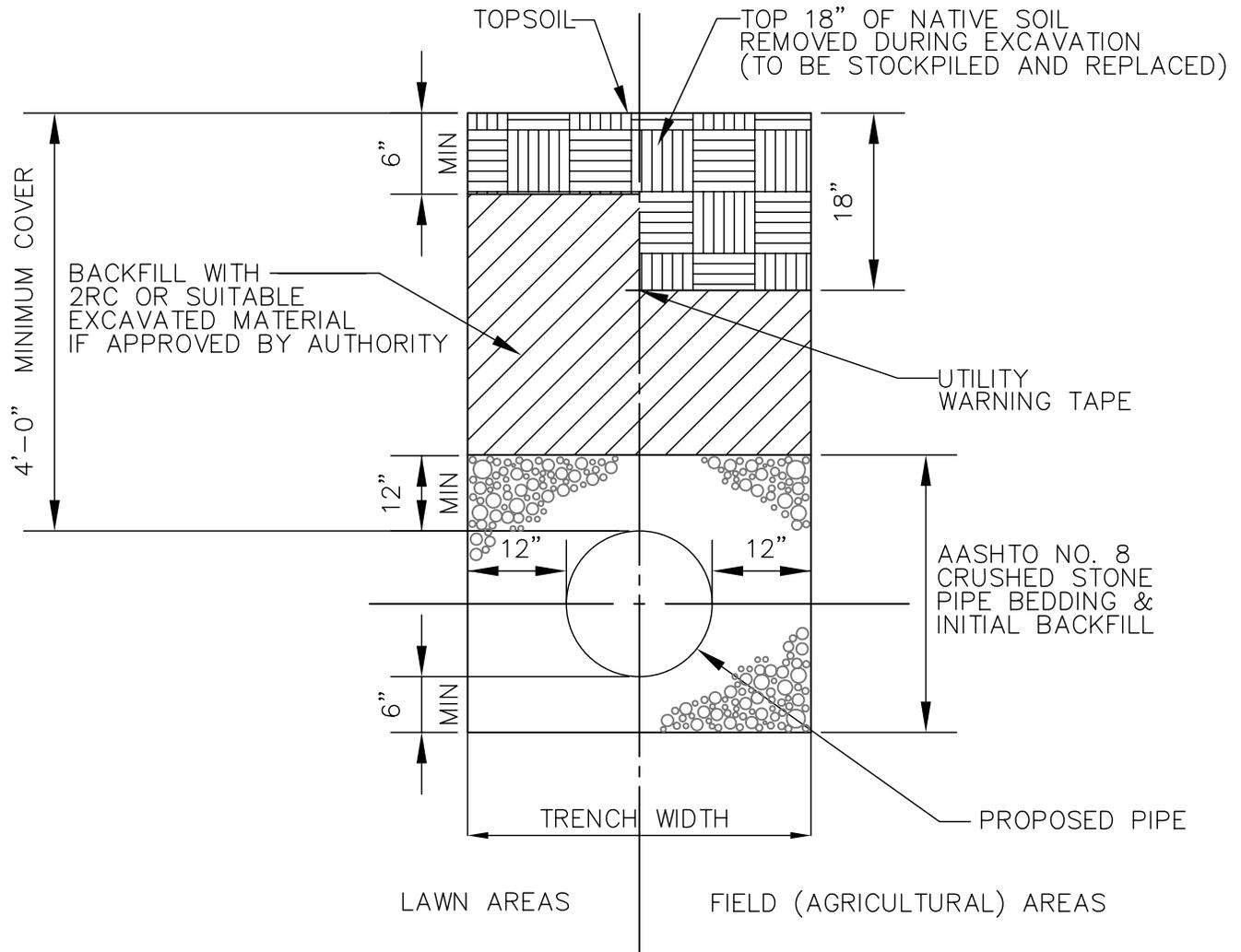


**NOTES:**

1. PRECAST CONCRETE ASSEMBLY SHALL CONTAIN XYPEX CONCRETE WATERPROOF ADMIXTURE.
2. RACEWAY LOCATED WITHIN VAULT SHALL BE SCHEDULE 80 EXTRA HEAVY PVC.

**SECTION A-A**

	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction		<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543		
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537		<b>STANDARD DETAIL</b> <b>COMBINATION DOMESTIC &amp; FIRE METER PIT</b>		
Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666		DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>	DRAWING NO.	
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PREPARED BY <b>MAL</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SER</b>			



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**TRENCH RESTORATION LAWN / FIELD AREAS DETAIL**

DATE:  
APRIL 2009

SCALE:  
N.T.S.

DRAWING NO.

REV. / DATE  
- -

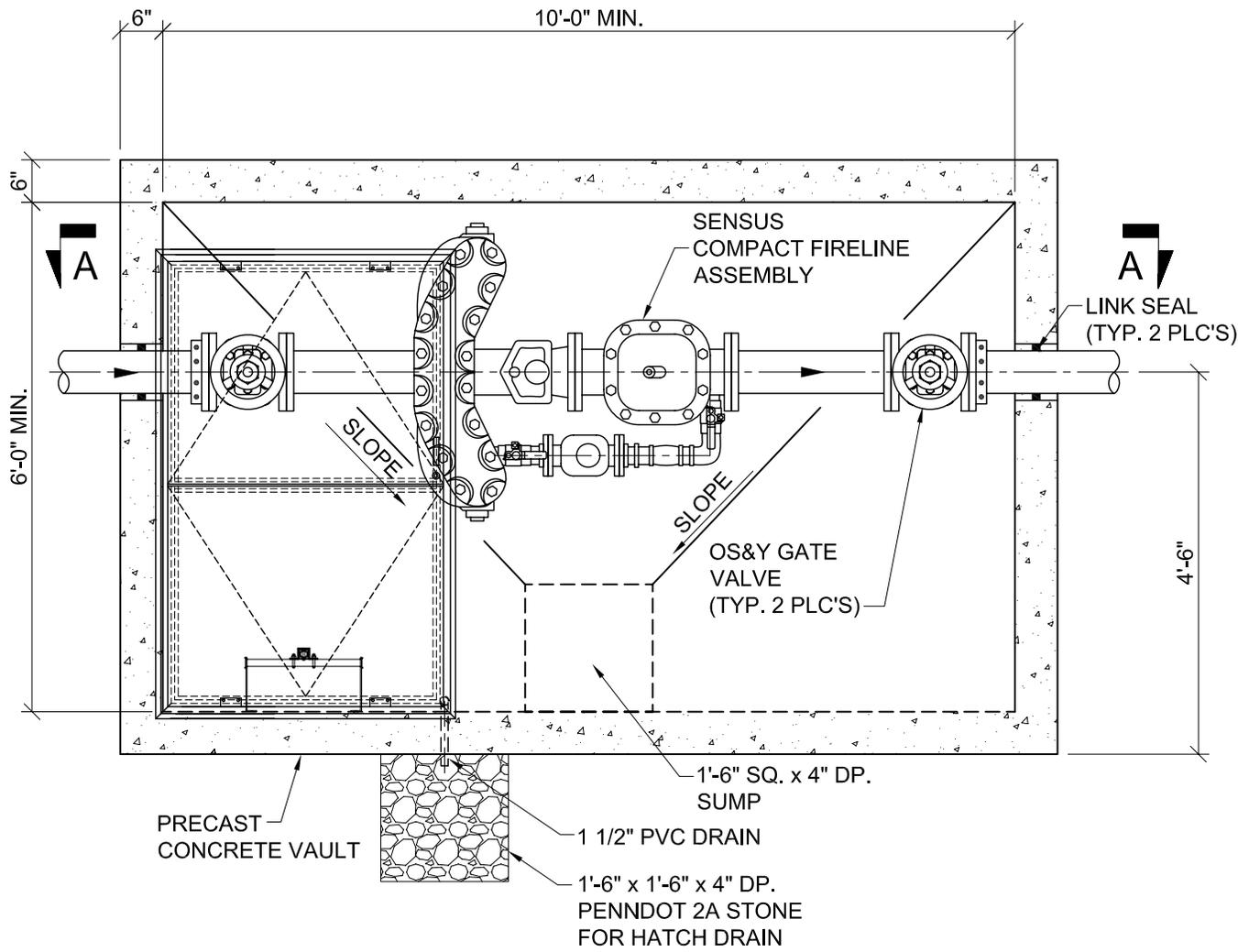
PROJECT NO.  
4185.26

**W2**

PREPARED BY  
BAM

CHECKED BY  
JDB

APPROVED BY  
SMC



**PLAN**



**Entech Engineering, Inc.**  
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Corporate Office:  
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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**FIRE METER PIT - HIGH DOMESTIC USE**

DATE:  
APRIL 2009

SCALE:  
N.T.S.

DRAWING NO.

REV. / DATE  
- -

PROJECT NO.  
4185.26

**W20 (1 of 2)**

PREPARED BY  
BAM

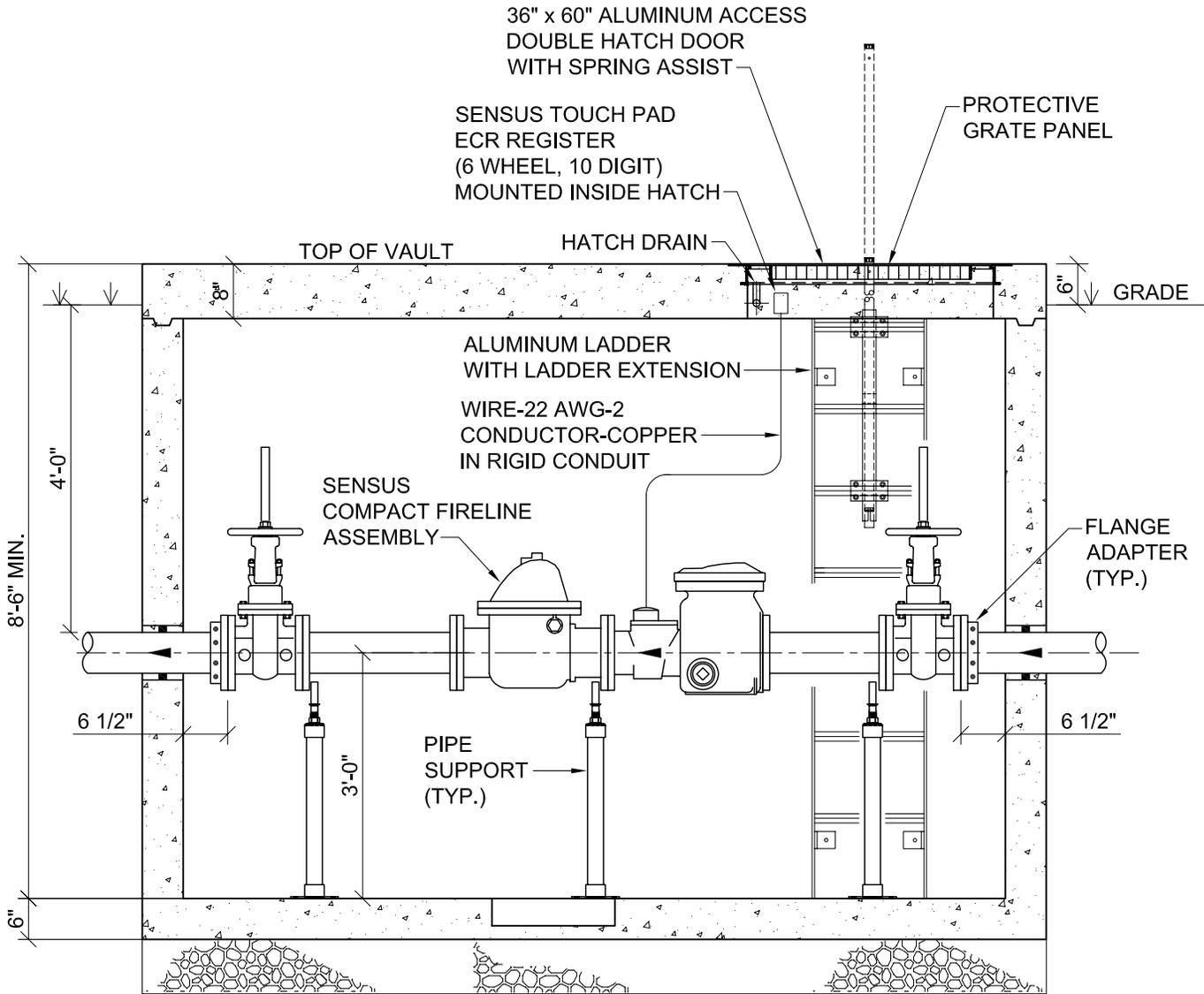
CHECKED BY  
JDB

APPROVED BY  
SMC

**ENTECH**

# DELETED

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543		
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537	<b>STANDARD DETAIL</b> <b>FIRE METER PIT - HIGH DOMESTIC USE</b>		
	Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666	DATE: APRIL 2009	SCALE: N.T.S.	DRAWING NO.
PREPARED BY MAL	CHECKED BY JDB	APPROVED BY SER	REV. / DATE 1 AUG. 2013	PROJECT NO. 4185.26
				<b>W20 (1 of 2)</b>



**NOTES:**

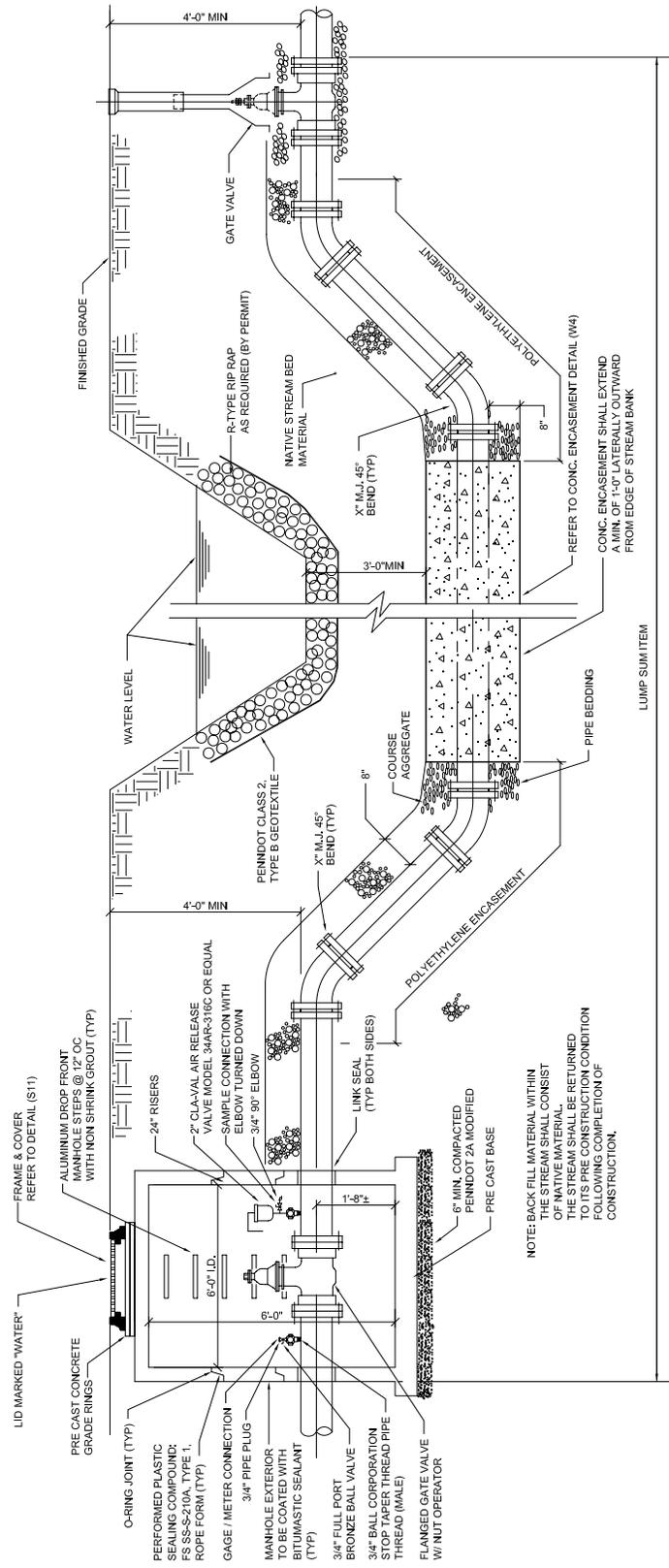
1. PRECAST CONCRETE ASSEMBLY SHALL CONTAIN XYPEX CONCRETE WATERPROOF ADMIXTURE.
2. RACEWAY LOCATED WITHIN VAULT SHALL BE SCHEDULE 80 EXTRA HEAVY PVC.

**SECTION A-A**

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537 Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666 www.entecheng.com 1.800.825.1372		<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>FIRE METER PIT - HIGH DOMESTIC USE</b>		
	PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>	DATE: <b>APRIL 2009</b>	SCALE: <b>N.T.S.</b>
			REV. / DATE - -	PROJECT NO. <b>4185.26</b>	

# DELETED

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	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537	<b>STANDARD DETAIL</b> <b>FIRE METER PIT - HIGH DOMESTIC USE</b>		
	Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666	DATE: APRIL 2009	SCALE: N.T.S.	DRAWING NO.
PREPARED BY MAL	CHECKED BY JDB	APPROVED BY SER	REV. / DATE 1 AUG. 2013	PROJECT NO. 4185.26
				<b>W20 (2 of 2)</b>



NOTE: BACK FILL MATERIAL WITHIN THE STREAM SHALL CONSIST OF NATIVE MATERIAL. THE STREAM SHALL BE RETURNED TO ORIGINAL CONDITION FOLLOWING COMPLETION OF CONSTRUCTION.



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**WATER MAIN STREAM CROSSING DETAIL**

PREPARED BY  
**BAM**

CHECKED BY  
**JDB**

APPROVED BY  
**SMC**

DATE:  
**APRIL 2009**

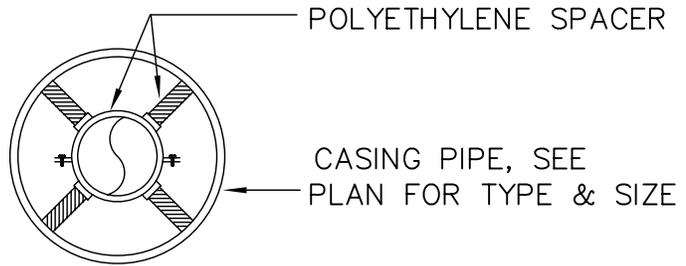
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SCALE:  
**N.T.S.**

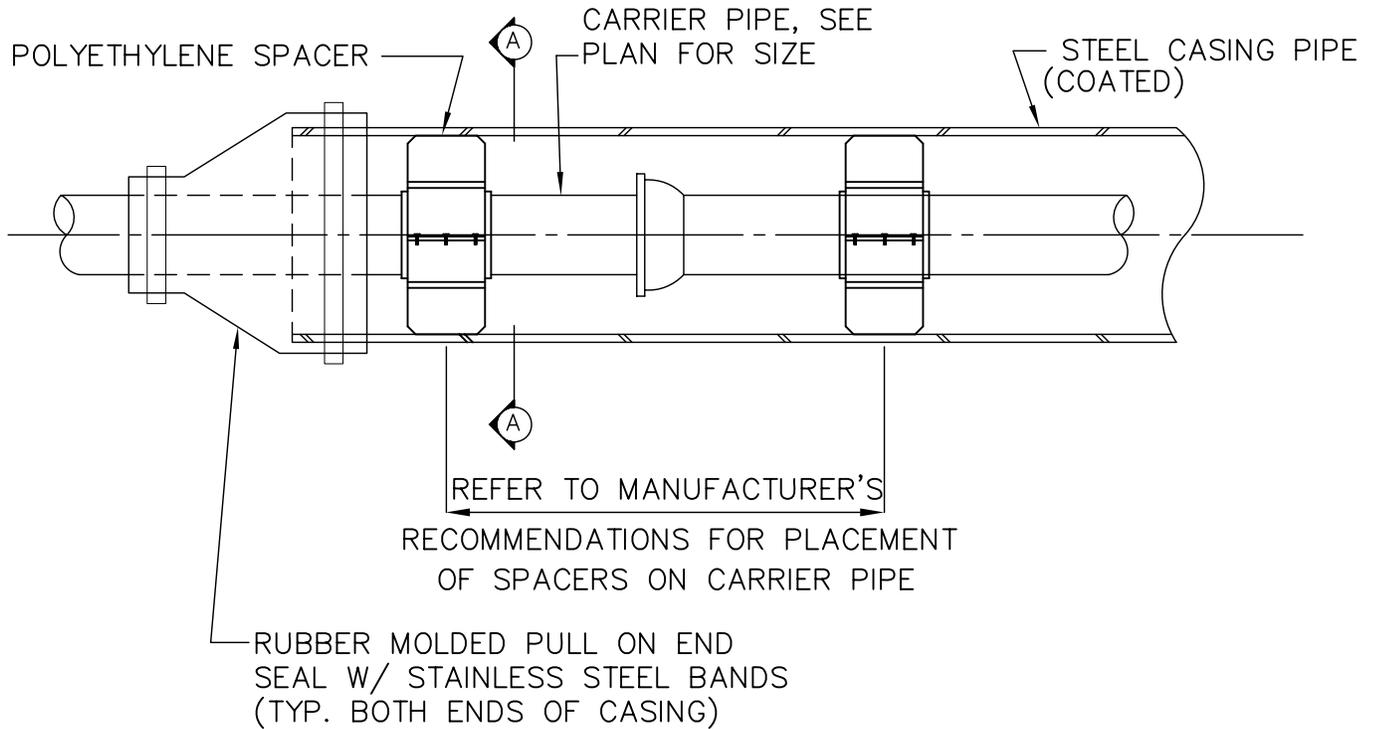
PROJECT NO.  
**4185.26**

DRAWING NO.

**W21**



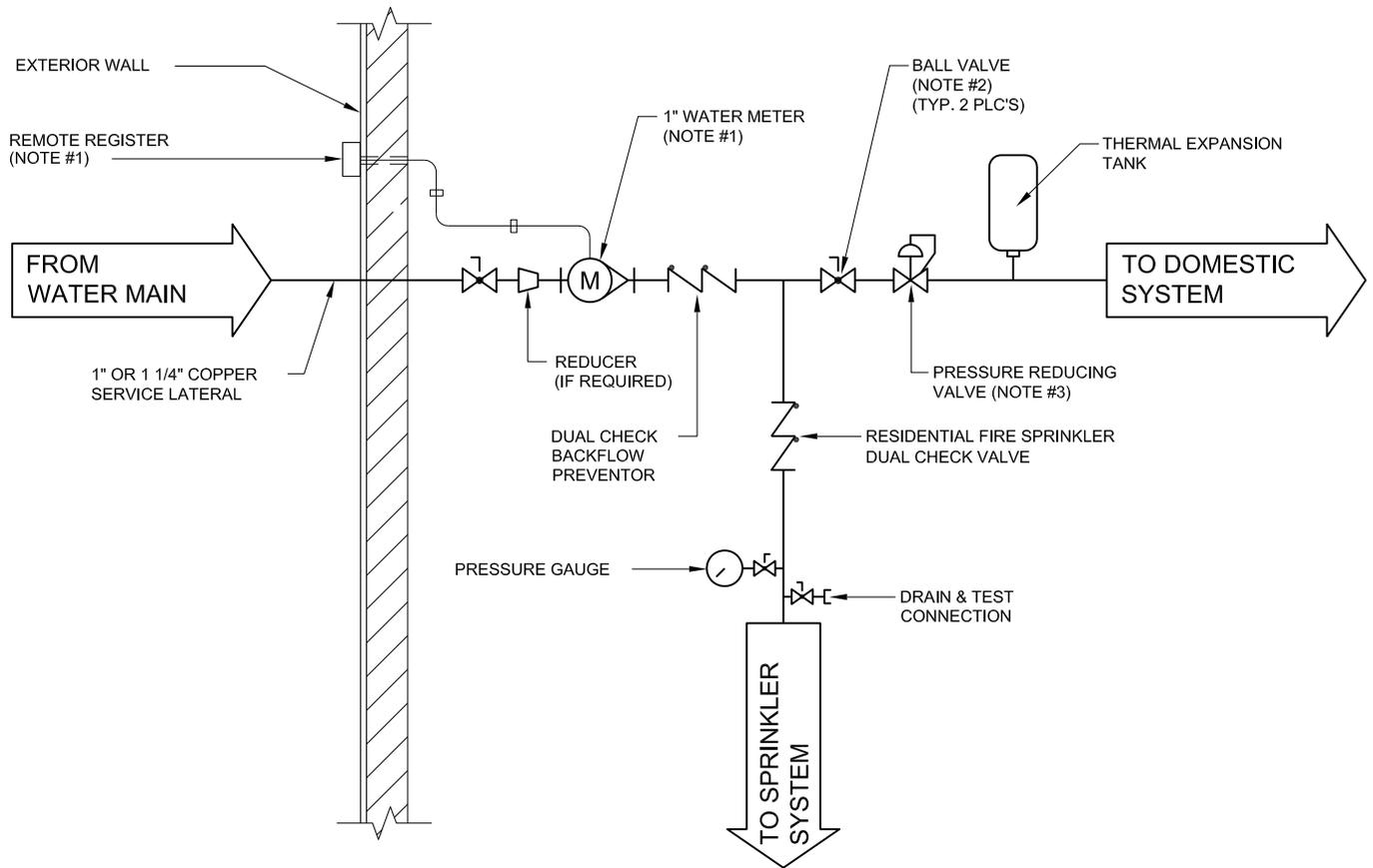
SECTION A-A



CASING NOTES:

1. DESIGN ENGINEER IS RESPONSIBLE FOR PROPER SIZING OF THE CASING PIPE TO HOUSE CARRIER PIPE AND TO WITHSTAND LOADING DEMANDS.

	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction		<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543 <b>STANDARD DETAIL</b> <b>WATER MAIN PIPE CASING DETAIL</b>		
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  www.entecheng.com 1.800.825.1372		DATE:	SCALE:	DRAWING NO.
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BAM	JDB	SMC	- / -	4185.26	



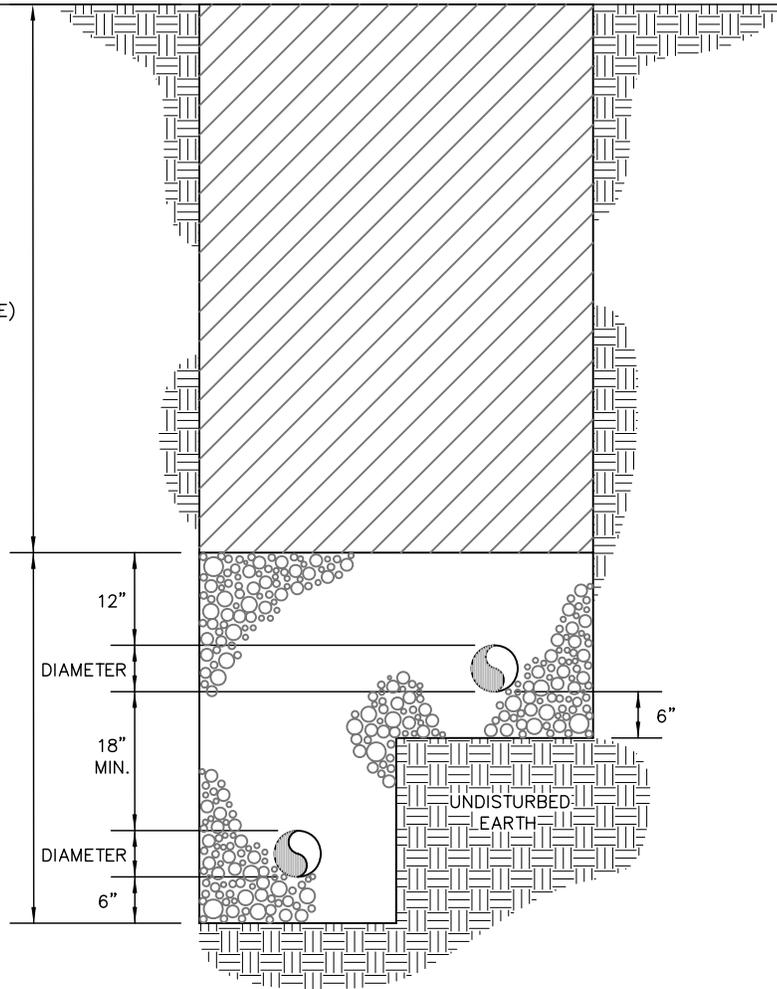
## GENERAL METER INSTALLATION NOTES

1. METER SPUD, METER, REMOTE REGISTER AND ROM CABLE WIRE PROVIDED BY WARWICK TOWNSHIP MUNICIPAL AUTHORITY (WTMA) CUSTOMER SHALL PROVIDE ENOUGH LAYING LENGTH TO ACCOMODATE METER. METER INSTALLATION, ROUTING, TERMINATION OF ROM CABLE AND METER AND SEALING WIRE SHALL BE BY THE AUTHORITY.
2. ISOLATION VALVES SHALL BE BRONZE FULL PORT BALL VALVES WITH THREADED ENDS.
3. PROVIDE PRESSURE REDUCER WHERE SYSTEM PRESSURE EXCEEDS 80 PSI
4. PROVIDE COPPER PLATED PIPE SUPPORTS ANCHORED FROM STRUCTURE
5. MAINTAIN ADEQUATE CLEARANCE AROUND METER INSTALLATION TO FACILITATE FUTURE MAINTENANCE BY WTMA.

 <b>ENTECH</b>	<b>Entech Engineering, Inc.</b> Engineering Architecture Construction	<b>WARWICK TOWNSHIP MUNICIPAL AUTHORITY</b> 315 CLAY ROAD, LITITZ, PA 17543			
	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537  Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666  <a href="http://www.entecheng.com">www.entecheng.com</a> 1.800.825.1372	<b>STANDARD DETAIL</b> <b>COMBINED RESIDENTIAL DOMESTIC / SPRINKLER SERVICE DETAIL</b>			
PREPARED BY <b>BAM</b>	CHECKED BY <b>JDB</b>	APPROVED BY <b>SMC</b>	DATE: <b>MAY 2011</b>	SCALE: <b>N.T.S.</b>	DRAWING NO.  <b>W23</b>
			REV. / DATE <b>- -</b>	PROJECT NO. <b>4185.26</b>	

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

ASSHTO NO.8 CRUSHED STONE PIPE BEDDING AND INITIAL BACKFILL



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**COMBINED WATER / SEWER TRENCH**

**ENTECH**

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**BAM**

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**JDB**

APPROVED BY  
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DATE:  
**APRIL 2009**

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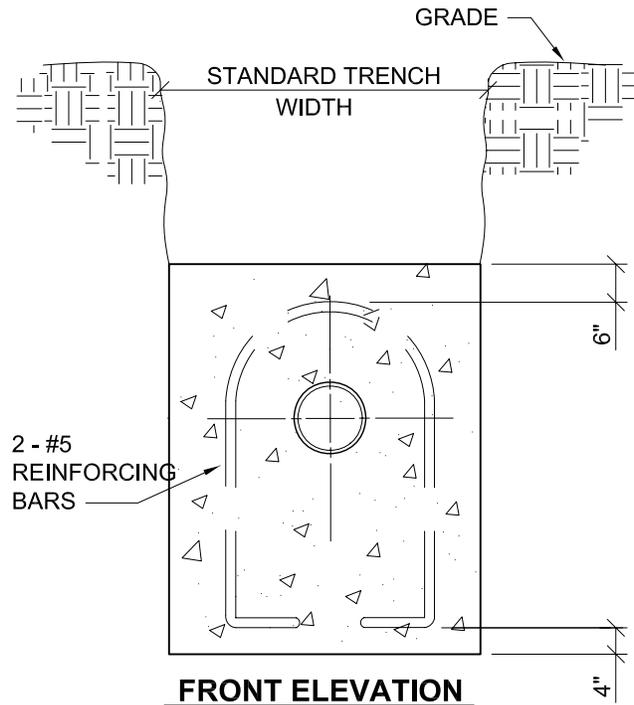
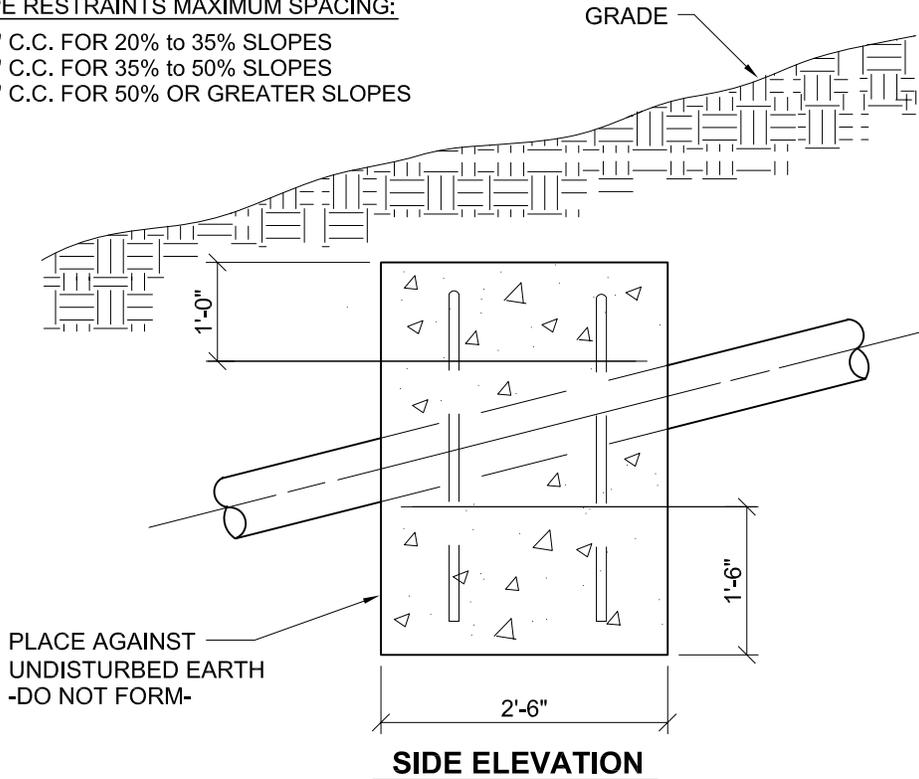
PROJECT NO.  
**4185.26**

**W3**



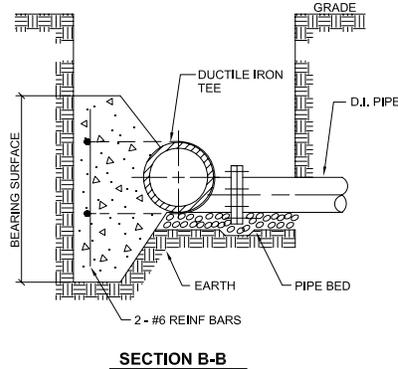
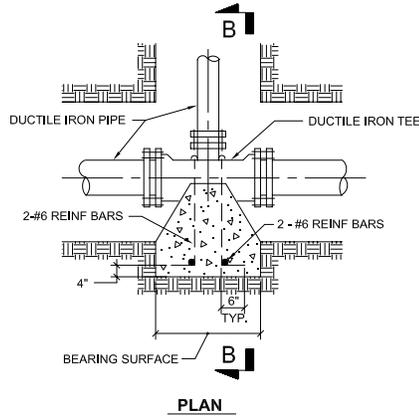
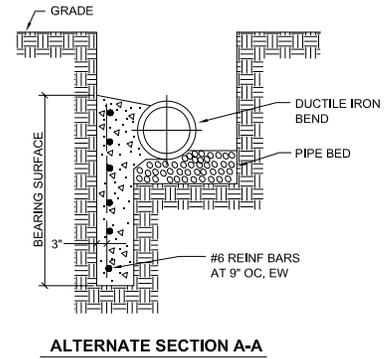
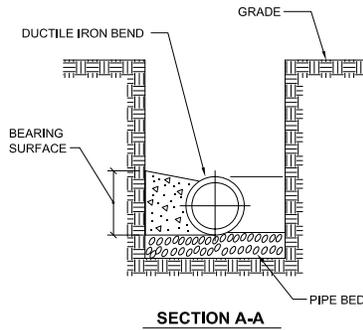
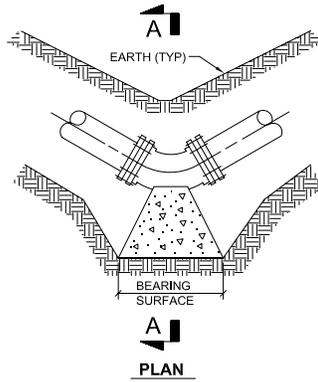
**PIPE RESTRAINTS MAXIMUM SPACING:**

- 36' C.C. FOR 20% TO 35% SLOPES
- 24' C.C. FOR 35% TO 50% SLOPES
- 16' C.C. FOR 50% OR GREATER SLOPES



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	Corporate Office: 4 S. Fourth Street Reading, PA 19602 ph: 610.373.6667 fx: 610.373.7537		<b>STANDARD DETAIL</b> CONCRETE SLOPE COLLAR ANCHOR DETAIL		
<b>ENTECH</b>	Pottsville, PA ph: 570.628.5655 Mountaintop, PA ph: 570.868.0275 Lititz, PA ph: 717.626.6666		DATE:	SCALE:	DRAWING NO.
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**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"			
	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	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"			
	DEGREE BEND OR DEFLECTION			
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	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:**

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS.
3. INSTALL CONCRETE THRUST BLOCKS AT EACH ELBOW, TEE AND CAPPED OR VALVED END FITTINGS LOCATED IN THE HORIZONTAL PLANE.
4. PAINT ALL EXPOSED STEEL WITH TWO COATS OF ASPHALT PAINT.
5. NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
6. ALL-THREADS WITH PIPE STRAPS MAY BE USED IN PLACE OF REINFORCING BARS.
7. ALL THRUST BLOCKS SHOWN ARE INTENDED AS A GUIDE AND SHALL WITHSTAND THE REQUIRED PRESSURE.
8. RETAINER GLANDS REQUIRED ON ALL MECHANICAL JOINT FITTINGS.
9. CERTAIN SITUATIONS MAY WARRANT THE USE OF TIE RODS, AUTHORIZED BY THE AUTHORITY ONLY.
10. PIPING SHALL BE WRAPPED WITH POLYETHYLENE PRIOR TO PLACEMENT OF CONCRETE.
11. FOR SOIL BEARING VALUES LESS THAN 1 TON / SQ. FT., CONSULT WITH AUTHORITY ENGINEER FOR RECOMMENDATION.



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**HORIZONTAL THRUST BLOCKING DETAIL**

DATE:  
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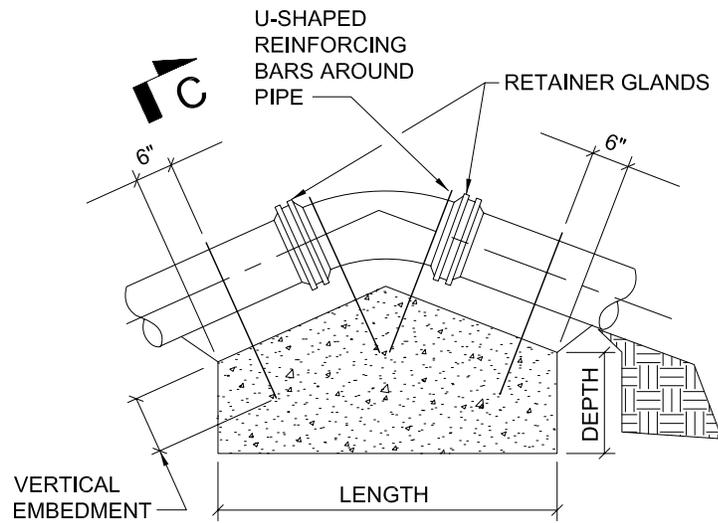
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**W7**

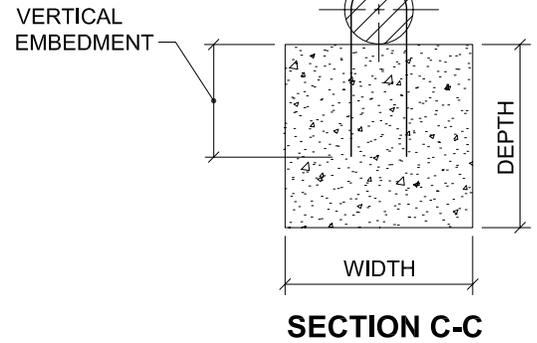
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EACH U-SHAPED BAR SHALL BE CONSIDERED AS ONE BAR FOR COMPUTING CROSS SECTIONAL AREAS



**VERTICAL THRUST UPWARD**

### 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. <sup>2</sup> 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"



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**WARWICK TOWNSHIP MUNICIPAL AUTHORITY**

315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**VERTICAL THRUST BLOCKING DETAIL**

DATE:  
**APRIL 2009**

SCALE:  
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**W8**

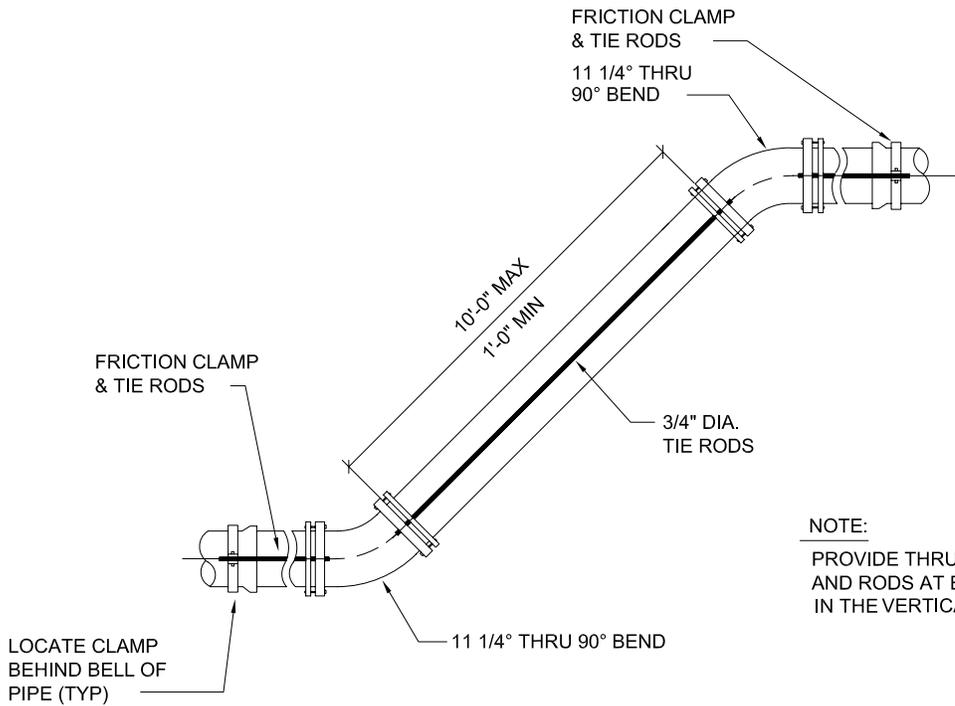
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**NOTE:**

PROVIDE THRUST CLAMPS WITH LUGS AND RODS AT EACH ELBOW LOCATED IN THE VERTICAL PLANE.



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315 CLAY ROAD, LITITZ, PA 17543

**STANDARD DETAIL**

**THRUST CLAMPING DETAIL**

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