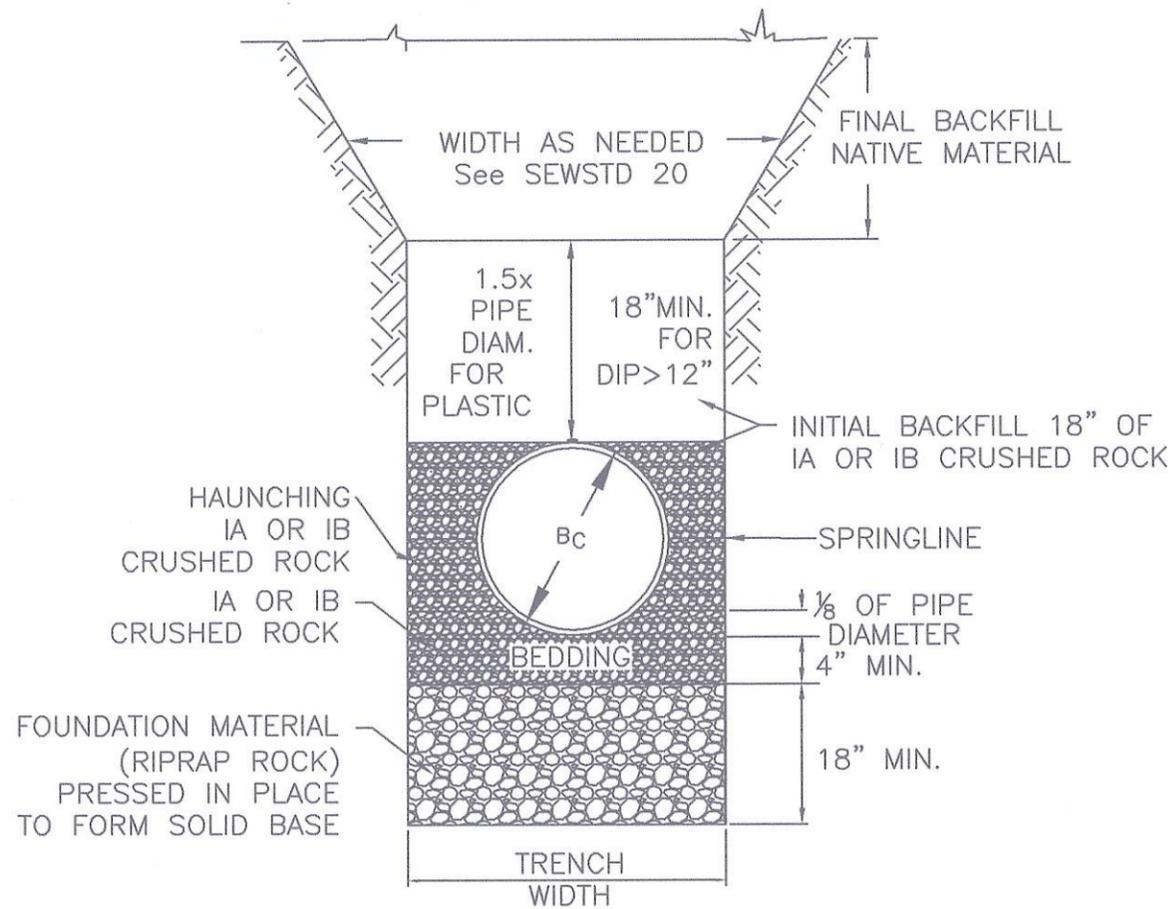
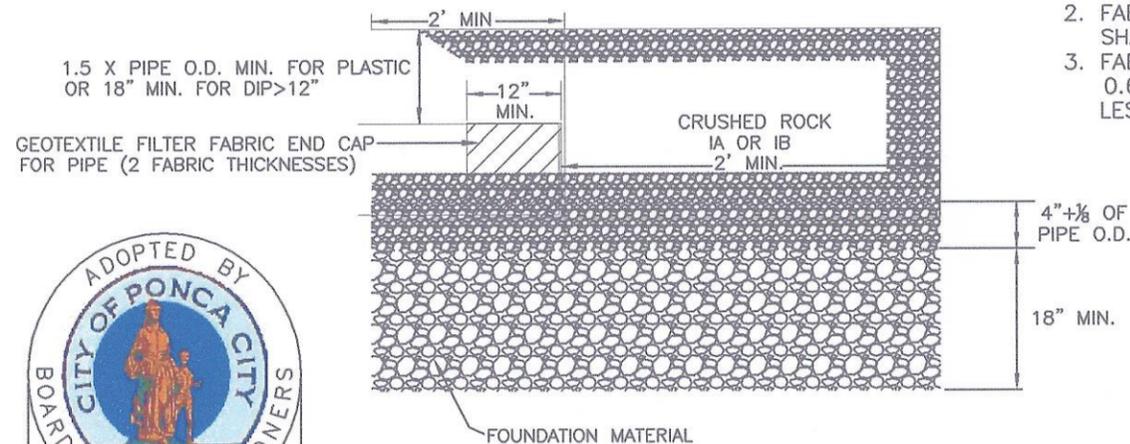


1. INSTALLATION SHALL CONFORM TO ASTM D2321, EXCEPT FOR MORE STRINGENT REQUIREMENTS BELOW.
2. CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR TRENCH SETTLEMENT & MAINTAIN TRENCH FREE OF DEPRESSIONS AT SURFACE, THROUGH THE MAINTENANCE BOND PERIOD.
3. A COVER DEPTH OF 18" WITH WASHED CRUSHED STONE CONFORMING TO ASTM D2321 CLASS IA OR IB. IS REQUIRED IMMEDIATELY AFTER LAYING PIPE. A COVER DEPTH OF 1.5 PIPE DIAMETER IS USUALLY CONSIDERED NECESSARY TO PREVENT FLOATING THE MINIMUM COVER DEPTH TO PREVENT FLOATATION MAY BE REDUCED UPON SUBMISSION AND APPROVAL OF ENGINEERING CALCULATIONS.
4. WHERE PIPE TRENCH IS IN DRAINAGE DITCH, RE-GRADE DITCH FROM CULVERT INVERT TO CULVERT INVERT TO DRAIN & CLEAN & MAINTAIN CULVERTS FREE OF SILT UNTIL SODDING IS COMPLETE.
5. BEDDING MATERIAL SHALL CONFORM TO ASTM D2321 CLASS IA OR IB (GRAVEL BEDDING) ODOT AGGREGATE SIZE 57 OR 67 SATISFIES THIS REQUIREMENT.
6. FOUNDATION MATERIAL SHALL BE RIPRAP SIZED FOR 12" THICKNESS CONFORMING TO ODOT SECTION 713, BUT SHALL BE PLACED AND PRESSED INTO TRENCH BOTTOM TO CREATE A STABLE BASE, BUT SHALL NOT BE LESS THAN 18" BELOW BEDDING THE REFERENCED ODOT STANDARD REQUIRES A MAXIMUM SIZE ROCK OF 150 LBS. (ABOUT 14.4"), AN AVERAGE SIZE BETWEEN 30-50 LBS. (ABOUT 8.4"-10"), AND NO MORE THAN 20% LESS THAN 20 LBS. (ABOUT 7.5"). ASTM C33 SIZE 1 AGGREGATE (1.5"-3.5") IS ALSO ACCEPTABLE FOUNDATION MATERIAL.
7. CONTRACTOR SHALL PUMP AND DRAIN WATER BELOW FLOWLINE OF PIPE UNTIL INITIAL BACKFILL GRAVEL TO MINIMUM COVER DEPTH IN 3 ABOVE IS IN PLACE.
8. GRAVITY SEWER PIPE SHALL BE CLEANED & TESTED FOR INFILTRATION AS PER SEWSTD 10 FOR PLASTIC PIPE AND SEWSTD 20 FOR DIP.
9. DEFLECTION TEST (FOR PLASTIC PIPE) SHALL BE AS PER SEWSTD 10 & 11.
10. IT IS RECOGNIZED THAT TRENCHES WILL BE UNSTABLE AND VERY DIFFICULT TO MAINTAIN, THUS, MINIMUM TRENCH WIDTHS NEED ONLY BE HELD UNTIL INITIAL BACKFILL IS IN PLACE, TRENCH WIDTHS AND DEPTHS SHALL BE AS PER SEWSTD 10 OR 20.
11. MATERIAL EXCAVATED FROM TRENCH & PIPE BEDDING MATERIAL SHALL NOT BE PLACED ON ASPHALT OR CONCRETE PAVING, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER IN WRITING.
12. WITH PRIOR WRITTEN APPROVAL BY ENGINEER GROUNDWATER ONLY (WITHOUT SILT) MAY BE DRAINED TO SANITARY SEWER SYSTEM. AT ALL TIMES, PREVENT SURFACE OR RUNOFF WATER FROM ENTERING THE TRENCH. REMOVE WATER OR SEWAGE FROM DAMAGED UTILITY OR SERVICES LINES RUNNING INTO TRENCH AND GROUNDWATER. PUMP OR DRAIN TO REMOVE ANY WATER IN TRENCH AT NO ADDITIONAL COST TO OWNER. SEWAGE MUST BE DRAINED TO THE CITY SANITARY SEWER.
13. PIPE SHALL BE LAID WITH BELLS FACE UPSTREAM.
14. GEOTEXTILE FILTER FABRIC END CAP SHALL BE IN-PLACE ON THE OPEN END OF PIPES AT THE END OF DAILY CONSTRUCTION.
15. PIPE SHALL BE FREE FROM FOREIGN DEBRIS AND SILT.
16. ALL GROUNDWATER DRAINS SHALL BE PERMANENTLY PLUGGED AFTER INFILTRATION TESTING, AND THERE SHALL BE NO VISIBLE LEAKAGE.
17. THE DETERMINATION THAT QUICK OR UNSTABLE CONDITIONS EXIST (AND USE OF PAYMENT ITEMS IS WARRANTED) REQUIRES WRITTEN CONCURRENCE OF ENGINEER IN ADVANCE.



TYPICAL GRAVITY SEWER PIPE INSTALLATION
IN UNSTABLE SOIL OR QUICKSAND
SCALE: N.T.S.



DEWATERING DETAIL BY OPEN PIPE
SCALE: N.T.S.

SLOPE OF SANITARY SEWERS
The slope shall be as needed to transport peak hourly flow using a Manning's coefficient of 0.013, but the velocity must exceed 2 feet/sec.

Pipe Size, inches	Minimum Slope, feet/100 feet
4	1.00
6	0.50
8	0.40
10	0.29
12	0.22
14	0.17
15	0.15
16	0.14
18	0.12
20	0.10
21	0.10
24	0.08
27	0.066
30	0.057
36	0.045

- GEOTEXTILE FILTER FABRIC SHALL CONFORM TO AASHTO M288 CLASS A FOR SUBSURFACE DRAINAGE.
1. FABRIC PERMEABILITY (cm/sec) SHALL BE GREATER THAN SOIL PERMEABILITY. FABRIC PERMEABILITY = PERMITTIVITY X NOMIAL THICKNESS
 2. FABRIC APPARENT OPENING SIZE (AOS) FOR FABRIC END CAP SHALL BE LESS THAN 0.6 mm.
 3. FABRIC APPARENT OPENING SIZE (AOS) FOR ENVELOPE SHALL BE LESS THAN 0.6 mm. IF NATIVE SOIL HAS LESS THAN 50% BY WEIGHT PASSING 200 MESH, OR LESS THAN 0.297 mm. IF NATIVE SOIL HAS MORE THAN 50% PASSING 200 MESH.



GRAVITY SANITARY SEWER PIPE STANDARD FOR UNSTABLE OR QUICK CONDITIONS

THE CITY OF
PONCA CITY, OKLAHOMA

CITY ENGINEERING DEPT. * 516 E. GRAND * P. O. BOX 1450 * PONCA CITY, OK. * (580)767-0326, FAX-0325

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			SEWSTD 30