

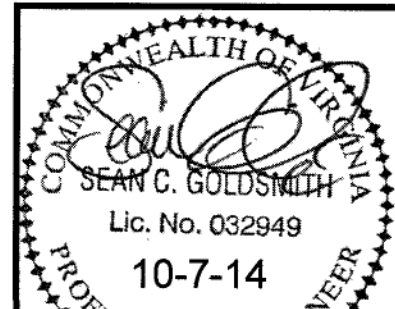
SANITARY SEWER NOTES:

1. ALL CONSTRUCTION, INSTALLATION, AND TESTING OF WATER AND SANITARY SEWER SHALL COMPLY WITH THE CURRENT EDITION OF THE BOTETOURT COUNTY WATER AND SEWER STANDARDS.
2. CONTRACTOR SHALL OBTAIN A COPY OF THE MOST RECENT EDITION OF THE BOTETOURT COUNTY WATER AND SEWER CONSTRUCTION STANDARDS & SPECIFICATIONS. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE COUNTY CONCERNING THE CONTRACTOR'S POSSESSION OF AND FAMILIARITY WITH STANDARDS AND REQUIREMENTS THEREIN.
3. CONTRACTOR SHALL SCHEDULE A PRECONSTRUCTION MEETING ONSITE TO BE ATTENDED BY NO LESS THAN THE FOLLOWING: BOTETOURT COUNTY REPRESENTATIVES, CONTRACTOR'S REPRESENTATIVE (INCLUDING SITE SUPERINTENDENT OF UTILITY INSTALLATION), DESIGN ENGINEER, ANY MATERIAL SUPPLIERS OR SUBCONTRACTORS THAT THE CONTRACTOR FEELS NECESSARY TO ATTEND.
4. MINIMUM COVER ON ALL PIPE SHALL BE 3 FEET, UNLESS OTHERWISE SPECIFICALLY INDICATED ON THESE DRAWINGS. ALL PVC PIPE SHALL BE INSTALLED WITH COATED TRACER WIRE TO FACILITATE FUTURE LOCATION OF PIPE AFTER CONSTRUCTION IS COMPLETED.
5. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE JOINT DEFLECTION OR BARREL BEND RADIUS SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDED DEFLECTION ANGLE OR BEND RADIUS.
6. NO PLANTINGS SHALL BE ALLOWED WITHIN THE SANITARY SEWER EASEMENT. NO PLANTINGS SHALL BE ALLOWED WITHIN 10' OF SANITARY SEWER SERVICE CLEANOUTS.
7. ALL SANITARY SEWER STRUCTURES & LINES SHALL BE TESTED IN ACCORDANCE WITH BOTETOURT COUNTY SEWER TESTING STANDARDS (SECTION 203.10) NOTED HEREON.
8. AS-BUILT DRAWINGS WITH BEARINGS AND DISTANCES OF ALL MAIN LINES SHALL BE PROVIDED AT COMPLETION OF CONSTRUCTION.
9. MATERIALS (REFER TO BOTETOURT COUNTY SEWER STANDARDS FOR ADDITIONAL INFORMATION):  
MAIN LINE SEWER (8" AND LARGER):  
CLASS 51 DUCTILE IRON PIPE (ANSI A21.51), CEMENT LINED, SUP JOINT;  
SDR-35 PVC (ASTM 3034-77)  
SEWER LATERALS (4" & 6"):  
SDR-35 PVC (ASTM 3034-77)  
SCH 40 PVC (ASTM 1785-76)  
MANHOLES:  
PRECAST CONCRETE SECTIONS (ASTM C478) WITH FRAMES, COVERS, AND INTEGRAL STEPS. MANHOLE SUPPLIER MUST HAVE A CURRENT VDOT APPROVED QA PROGRAM. ALL MANHOLES JOINTS SHALL BE WATER TIGHT AND MADE WITH COLD APPLIED BUTYL MASTIC SEALER. ALL CONNECTIONS TO MANHOLES SHALL BE WATERTIGHT AND MADE WITH AN INTEGRAL CAST FLEXIBLE BOOT.  
FRAMES & COVERS:  
EAST JORDAN IRON WORKS, INC. (ASTM A-48, CLASS 20) BEST QUALITY TOUGH, GRAY IRON WITH "SEWER" DESIGNATION ON TOP. FRAMES SHALL BE BOLT-DOWN TYPE SET ON MASTIC SEALER WITH ADEQUATE THREADS AND NUTS TO FACILITATE MINOR ELEVATION ADJUSTMENTS. ALL ADJUSTMENT GAPS SHALL BE FILLED WITH SMALL AGGREGATE CONCRETE.

BOTETOURT COUNTY SEWER TESTING:

- 203.10 Acceptance Tests: Sewers will be inspected to determine if any deviation from line and grade has occurred. Pipe alignment will be checked by the mandrel test. If pipe shows poor alignment, displaced pipe, or any defect, including a visible leak, defect shall be corrected before leak testing of the pipe. All sewer lines are subject to internal inspection and testing by closed circuit TV by the Engineering/Utility Department based upon inspection results at the developer's expense.
- Air testing shall be used; test methods and acceptability criteria shall be in accordance with ASTM F1417 and the Uni-Bell low-pressure air test. Air testing of gravity lines shall be required for all types of pipe and materials.
- A. Manhole Acceptance Tests as per ASTM C1244.
1. Manholes, including frame, shall be tested by vacuum testing from the top of the frame. Inflatable stoppers shall be used to plug all lines into and out of the manhole being tested including any vent line. The stoppers shall be positioned in the lines far enough from the manhole to insure testing to those portions of the lines not air tested. Vacuum tests shall be made with a vacuum of 10" Hg. The time for the vacuum to drop from 10" to 9" of Hg must be greater than 60 seconds.
2. Contractor shall furnish weirs, stand pipes, pipe plugs, water, pressure gauges, stop watches, air compressor, vacuum pump, hose and such materials and assistance as required to perform these tests. Contractor shall conduct all acceptance tests in the presence of the project engineer or a County Inspector. All testing shall be documented by the project engineer.
3. Acceptance tests shall not be made until sanitary sewer, manholes and proposed sewer service connections, as shown on the approved sewer plans, have been installed, the sewer trenches (including manholes and cleanout stacks) backfilled and compacted to finished sub-grade.
4. Contractor shall schedule all acceptance tests with the project engineer and county inspector at least forty-eight (48) hours in advance. Each section of completed sewer shall be tested from manhole to manhole. No sewers or sewer service connections are to be excluded from this testing procedure.
- B. Sewer Pipe Testing Procedures as per ASTM F1417
1. Whenever it is necessary to construct underdrains or place gravel under pipe lines in order to dewater trench during construction of sewers, acceptance test will not be made until any pumps, which have been used in dewatering process, have been disconnected or drains have been taken out of service.
2. Contractor shall schedule all acceptance tests with the project engineer and the Engineering/Utility Department at least forty-eight (48) hours in advance. Each section of completed sewer shall be tested. Generally, sewers will be tested from manhole to manhole. No sewer or sewer service connection is to be excluded from this testing procedure.
3. Low Pressure Air Testing Procedure: - The test procedure shall be conducted in the following manner: (Vacuum test of manholes is generally inverse of low pressure air test of sewer lines)
- a. Contractor shall thoroughly clean and remove all debris, silt, earth or other materials from the sewer prior to acceptance testing.
- b. Proper test plugs shall be supplied and installed by Contractor. Test gauges used in air test procedure shall have a range of 0-10 psi and shall be calibrated in divisions of 0.10 psi with an accuracy of +/- one percent. Test gauges shall be calibrated at least once a year and the date and results displayed on the equipment including date of calibration. Calibrations shall be certified by an independent testing lab. Test gauges shall be located outside of manhole during testing.
- c. If pipe to be tested is expected to be below ground water table, Contractor shall either: - Install a small diameter perforated vertical pipe from invert elevation of the sewer to the surface prior to backfilling; or - Insert a pipe probe by boring or driving into the backfilling material adjacent to the invert elevation of the pipe, and determine the depth of the ground water level above the pipe invert immediately prior to acceptance testing the sewer.
- All gauge pressures for test shall be increased by the amount of this back pressure due to ground water over the invert of the pipe.

- In lieu of the above water depth determination, Contractor may add three (3) psi to the gauge pressure in the test.
- d. Contractor shall add air slowly to the portion of the pipe under test until the internal air pressure is raised to 4.0 psi gauge plus the ground water table pressure.
- e. As a safety precaution, no one shall be allowed in manhole after air pressure is increased in the sewer line. If the inspector suspects that the test plug may be leaking, pressure shall first be relieved before any adjustments are made to eliminate air leakage at the plug.
- f. Contractor shall allow air temperature to stabilize for at least two (2) minutes with the pipe subjected to an internal pressure of 4.0 psi by adding only the amount of air required to maintain the pressure.
- g. After temperature stabilization, the test will begin. If the internal air pressure decreases, the time required for the pressure to drop from 3.5 to 2.5 psi gauge will be observed and recorded. The time interval shall be compared with the established standards in accordance with details BCI SS-2728 for time and length of test section for various diameters of the sewer. All pipes 15 inches or less shall be tested for a pressure drop of 1.0 psi gauge.
- h. Pipe which fails to maintain the stipulated pressure for a period equal to or greater than the holding time shown in Table I shall be deemed to have failed the low pressure air test and is unsatisfactory for acceptance by the County. Any sewer that fails to pass this test shall be replaced by the Contractor at his expense.



Revisions By	Date
1-WTR & SWR RVSN	10/7/14



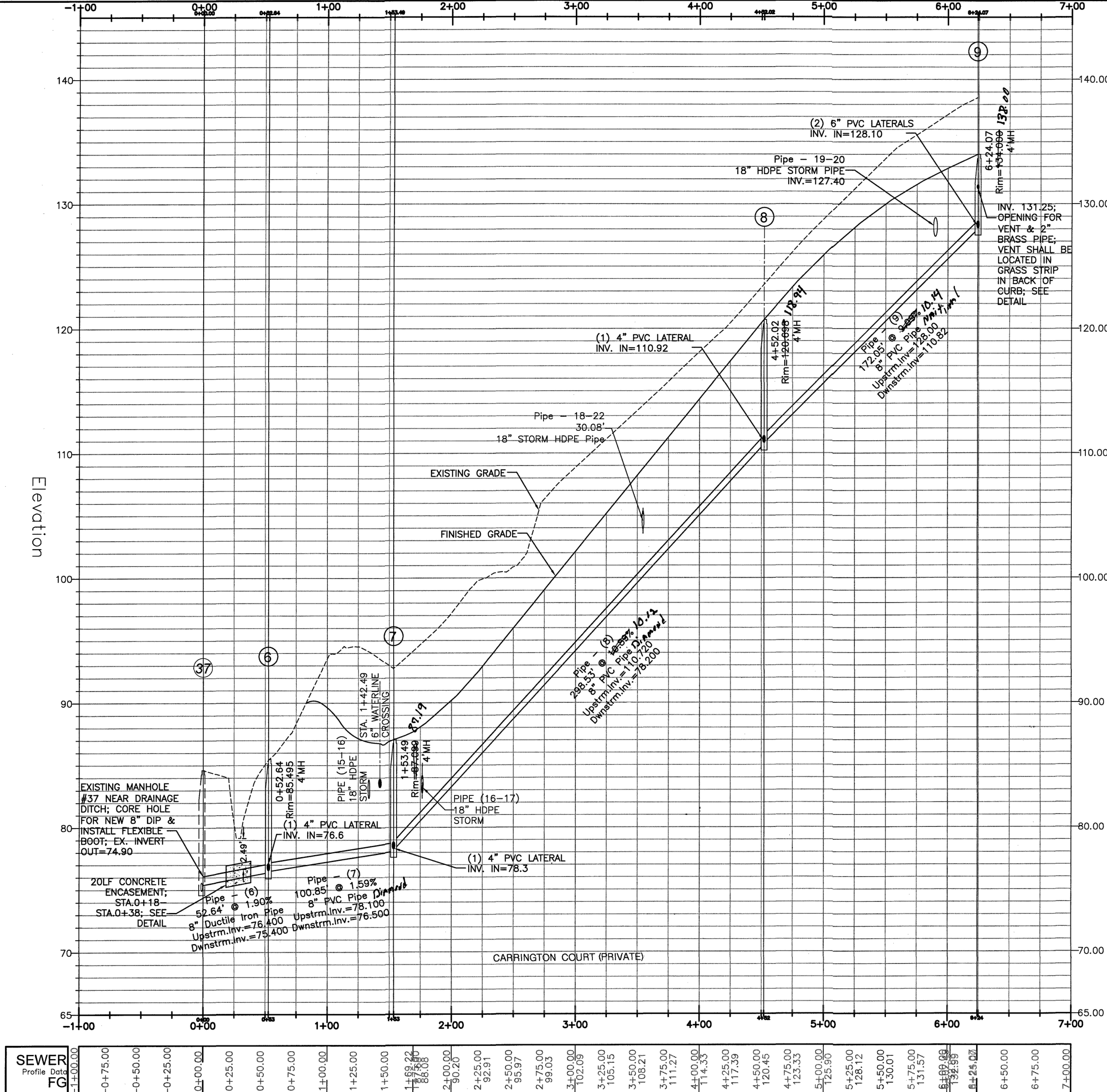
SANITARY SEWER PROFILE 6-9 & NOTES

PHASE 1 - EX. MH37 - PVT. RD.3  
CARRINGTON COURT (PRIVATE)  
COTTAGES OF STEEPLECHASE  
BOTETOURT COUNTY, VIRGINIA

Scale: H:1"=50' V:1"=5'  
Date: 8/13/14  
Design By: SCG  
CAD By: SCG  
Checked By:  
Project No.: 12052

Sheet No.

C10



Pipe Diameter (in.)	Min. Time (min.)	Length for Min. Time (ft.)	Specified Time for Length (L) Shown (min./sec)						
			100 ft.	150 ft.	200 ft.	250 ft.	300 ft.	350 ft.	400 ft.
4	3.46	587	3.46	3.46	3.46	3.46	3.46	3.46	3.46
6	5.40	398	854 L	5.40	5.40	5.40	5.40	5.40	5.42
8	7.34	298	1,520 L	7.34	7.34	7.34	7.36	8.52	10.08
10	9.29	238	2,374 L	9.29	9.29	9.53	11.52	13.51	15.49
12	11.20	199	3,418 L	11.20	11.20	11.24	14.15	17.05	19.55
15	14.10	159	5,342 L	14.10	17.48	22.15	28.42	31.09	35.38
18	17.00	133	7,892 L	17.00	19.13	25.38	32.03	38.27	44.52
21	19.50	114	10,470 L	19.50	26.10	34.54	43.37	52.21	61.00
24	22.49	99	13,674 L	22.47	34.11	45.34	56.58	68.22	79.46
27	25.30	88	17,306 L	26.51	43.16	57.41	72.07	86.32	100.57
30	28.20	80	21,366 L	35.37	53.25	71.13	89.02	106.50	124.38
33	31.10	72	25,852 L	43.95	64.38	88.10	107.43	129.16	150.43
36	34.00	66	30,766 L	51.17	76.55	102.34	128.12	153.50	179.29

MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q=0.0015

Pipe Diameter (in.)	Min. Time (min.)	Length for Min. Time (ft.)	Specified Time for Length (L) Shown (min./sec)						
			100 ft.	150 ft.	200 ft.	250 ft.	300 ft.	350 ft.	400 ft.
18	8.30	133	3,846 L	8.30	12.49	16.01	19.14	22.26	25.38
21	9.55	114	5,235 L	9.55	13.05	17.27	21.49	26.11	30.32
24	11.20	99	6,937 L	11.24	17.57	22.48	28.30	34.11	39.53
27	12.45	88	8,653 L	14.25	21.38	28.51	36.04	43.16	50.30
30	14.10	80	10,683 L	17.48	26.43	35.37	44.31	53.25	62.19
33	15.35	72	12,920 L	21.33	32.19	43.56	53.25	64.38	75.24
36	17.00	66	15,394 L	25.39	38.28	51.17	64.06	76.55	89.44

MINIMUM SPECIFIED TIME REQUIRED FOR A 0.5 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q=0.0015



BOTETOURT COUNTY  
PUBLIC FACILITIES & PROGRAMS  
30 WEST BACK STREET, NUMBER 4  
FINCESVILLE, VA 24060  
PH: 540-473-8314  
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CONSTRUCTION STANDARDS  
PRESSURE-DROP-TABLES

DATE	REVISIONS

- NOTES:
1. DUCTILE IRON PIPE - TEST SHALL BE IN ACCORDANCE WITH ASTM C924 AND C928.  
2. PVC AND PE PIPE - TEST SHALL BE IN ACCORDANCE WITH ASTM F1417 & F2205.

- NOTES:
1. DUCTILE IRON PIPE - TEST SHALL BE IN ACCORDANCE WITH ASTM C924 AND C928.  
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