

Proposed changes to current Town of Pittsboro Standard Specifications, and Details

Monday, November 09, 2015

Proposed changes to Standard Specification Section 3 Public Water Distribution Construction

Current	New
Title block (added verbiage)	Add Public
01. Materials, P. (added verbiage)	<p>P. Polyethylene Wrap shall be used on all buried ductile iron pipe, fittings, gate valves and other appurtenances that are subject to corrosion either in the soil, or surrounding condition. Shall either be painted and/or wrapped with a Columbia blue polyethylene membrane conforming to ANSI A21.5, or installed in accordance with AWWA C105. The polyethylene sheets shall be 10 mils thick, minimum.</p> <p>The Town of Pittsboro shall determine on a case by case if polyethylene wrap is required. Soil corrosion is a geologic hazard that affects buried metals and concrete that is in direct contact with soil or bedrock. Soil corrosion is a complex phenomenon, with a multitude of variables involved. Pitting corrosion and stress-corrosion cracking (SCC) are a result of soil corrosion, which leads to underground oil and gas transmission pipeline failures. The corrosivity of soils can be estimated by measuring soil resistivity. Sandy soils are high on the resistivity scale and therefore considered the least corrosive. Clay soils, especially those contaminated with saline water are on the opposite end of the spectrum. Factors that influence soil corrosion are:</p> <ul style="list-style-type: none"> <li>• Porosity (aeration)</li> <li>• Electrical conductivity or resistivity</li> <li>• Dissolved salts, including depolarizers or inhibitors</li> <li>• Moisture</li> <li>• pH</li> </ul> <p>Each of these variables may affect the anodic and cathodic polarization characteristics of a metal in soil. The most corrosive soils have high content of:</p> <ul style="list-style-type: none"> <li>• Moisture</li> <li>• Electrical conductivity</li> <li>• Acidity</li> <li>• Dissolved salts</li> </ul> <p>In cases where metallic steel and ductile iron pipelines or encasement pipes are planned for installation in close proximity to any potential sources of stray current or aggressive soils, a field analysis consisting of stray current evaluation and soil testing shall be conducted by an experienced technician, as certified by the National Association of Corrosion Engineers, (NACE), to determine the potential for external corrosion at no additional cost to the Town of Pittsboro. In cases where stray current conditions and/or aggressive soils are prevalent, a corrosion specialist certified by the NACE or other applicable certification board shall be consulted regarding the design of pipeline protection measures.</p> <p>At a minimum, all stray current protection systems should include bonded joints and sacrificial anodes with a 50-year or longer design life and test facilities in lieu of polyethylene encasement, unless otherwise approved by the Town of Pittsboro. The cathodic protection element of the pipeline design package shall be sealed by Professional Engineer licensed in the State of NC.</p> <p>Full impressed current cathodic protection shall only be utilized when extreme corrosion potential has been proven and/or as otherwise directed by the Town of Pittsboro Engineering Department and the certified corrosion engineer of record.</p>
02. Installation and execution, E (verbiage change)	<p>E. Setting Fire Hydrants: Fire hydrants shall be set where shown on approved plans. Pipe for hydrant leg shall be ductile iron regardless of pipe material used on the main. The hydrants shall be set upon a bed of compacted crushed stone at least 36 inches square by 12 inches deep. When backfilling, washed stone or pea gravel shall be placed around the hydrant and above the drain holes so that the hydrant will properly drain when not in use. The hydrant and hydrant leg gate valve shall be securely restrained to the main line using an approved MJ fitting assembly. A concrete thrust block shall be placed behind the hydrant tee and hydrant assembly. No bells allowed in section of piping between valve, and hydrant, or shall be restrained. The hydrant assembly shall include restrained with MJ fitting at the tee, gate valve and the hydrant assemble. A 6-inch gate valve shall be installed on the hydrant leg within 10 feet of the hydrant, and restrained with a thrust block.</p> <p>Fire hydrants shall be set such that the hydrant base is flush with the project final grade.</p>
02. Installation and execution, H (verbiage change, and added)	<p>Water Main Flushing: Please refer to Town Pittsboro Specification 2, paragraph's 3, and 5.</p> <p>Prior to pressure testing, disinfecting and placing any water main into service, the water mains shall flushed with adequate velocity to flush sediment from the lines as follows:</p> <p>Flushing: All mains shall be flushed with adequate velocity to remove remaining sediment. A line velocity of at least 5 feet per second must be reached to obtained adequate scour for cleaning. Discharge shall be to a suitable point that will not result in flooding, erosion or flow into the sanitary sewer system.</p> <p>The Town of Pittsboro reserves the right to have contractor employee a "pig" after three (3) failed bacteriological samples.</p>

Pressure Testing Water Mains: Hydrostatic Testing: Town inspections staff must be present for all pressure tests. Pressure testing may be made before or after backfilling, but backfilling must be completed before allowance testing. If the pipe is center-loaded, a visual inspection for leaks may be made along the pipe line while the test section is under test pressure, and all visible leaks repaired. However, if mechanical compaction is to be used in the backfilling operations as spelled out in AWWA C-600, the tests shall not be made until the backfilling is completed and compacted. Backfill and compaction for the full distance encompassed by restrained/welded joints shall be completed prior to testing. All connections, blow offs, hydrants and valves shall be tested with the main as far as is practicable. Hydrostatic testing shall not begin until the pipe has been filled with water for at least 24 hours to allow for air venting.

Pressure Testing: Unless otherwise noted in the contract documents, the minimum prescribed test pressure shall be at least 200 psi for lines smaller than 16 inches and 150 psi for lines 16 inches or larger, not to exceed 5 psi over the minimum prescribed test pressure, as measured at the lowest end of the section under test. The duration of each pressure test shall be at least 2 hours, during which time the test section shall not drop below the minimum prescribed test pressure. If the pressure in the pipe test section has not stabilized by the end of the testing period, a hydrostatic retest will be required. Each section of a new line between sectionalizing valves or between the last sectionalizing valve and the end of the project shall be tested separately as required in AWWA C-600, and/or as modified in these specifications, except that any such section less than 500 feet in length may be tested with the adjacent section, if both sections of line have the same pipe class rating. No section greater than 1/2 mile in total pipe length shall be tested without special written permission of the Engineer.

Testing Allowance/Makeup Water: Makeup water volume shall be determined after the pressure test has been satisfactorily completed and all backfilling and compaction has been completed to top of trench. Testing allowance shall be defined as the maximum quantity of makeup water necessary to be supplied into the pipe line section under test to restore the ending test pressure to the beginning test pressure, after the pipe line has been filled with water and all air expelled. The Contractor shall furnish the necessary apparatus and assistance to conduct the test.

The duration of each makeup water test shall be at least 2 hours. To pass the allowance testing, the quantity of makeup water from the pipe line shall not exceed the makeup water quantity allowed by the following formula, from AWWA C-600:

$$M = \frac{SDVP}{148,000}$$

M = testing Allowance (makeup water), in gallons per hour.

S = length of pipe tested, in feet

D = nominal diameter of pipe, in inches.

P = test pressure of the pipe being tested, per 610.15 (A)

Should the test on any section of the pipe line require more makeup water than allowed by the above formula, the Contractor shall locate and repair the defective pipe, fittings, or joint until the makeup water volume is within the specified allowance. All repairs and retests, if required, shall be made at the Contractor's expense. Connections to the existing pipelines or existing valves shall not be made until after that section of new construction has satisfactorily passed the hydrostatic tests.

Ductile iron pipe used in conjunction with ACP will be tested to the ACP standards, unless otherwise directed by the Engineer of Record.

High pressure systems of all ductile iron pipe will be tested in accordance with AWWA C-600, Section 4.1. Pressure tests will not be considered acceptable and will not be approved without a representative of the Town of Pittsboro present. 48-hour notice shall be given to the Town inspector prior to pressure testing.

The Contractor shall pre-test all water mains before requesting pressure test observation from the Town of Pittsboro with a minimum 48 hour notification. No pressure tests will be observed without the Contractor's first pre-testing the water mains.

Excessive site visits will not be tolerated. In the event that more than two site visits are required for a segment of water main to pass pressure testing, the Town of Pittsboro shall bill the Owner for the additional visits at a rate of \$105 per hour.

02. Installation and execution, I. Pressure Testing Water Mains  
(verbiage change)

02. Installation and execution, K. Bacteriological Sampling (changed  
NCDENER)

NCDEQ