

9430100 INDUSTRY REVIEW COMMENTS

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Paul Harkins

Taking this excerpt from your language, ensure that the pipe joints have been hystostatically tested at the plant at the specified pressure, does reference need to be made to 430-4, which provides required pressure for each type of application, or could this be suggesting that the engineer specify the required joint performance for the specific site?

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Doug Holdener - Rinker Materials

Per the above referenced proposed specification change, the State of Florida appears to be reducing the standard of hydrostatic joint performance for steel and aluminum pipe and arch governed by Sections 943 and 945 (hereby referred to as metal pipe). The proposed specification seemingly ignores the potential for point load distortion pipe and pipe profile variation and misalignment at the vicinity of the joint. Additionally, the proposed specification produces an advantageous opportunity for metal pipe with respect to polyvinyl chloride (PVC) pipe, steel-reinforced concrete pipe (RCP), fiber cementitious pipe (FCP), and high-density polyethylene pipe (HDPE).

If you recall the March 15 meeting of the Florida Transportation Builders Association (FTBA) contractors at District 7, the Concrete Pipe Division of Rinker Materials requested justification from the Department for this apparent relaxation in metal pipe joint performance in plant testing. At that meeting, both you and the State Structures Design Engineer, William Nickas, requested that we submit a written request for justification from the Department on this issue. We appreciate this opportunity to submit comments to the Department.

**Straight Alignment of Pipe Joint Hydrostatic Plant Test**

Per both the current and proposed specifications Sections 430, 449, and 948, all pipe types are to be hydrostatically tested with joints in straight alignment at the respective manufacturing facility. For RCP and FCP, the test requirements are per ASTM C443. For PVC, HDPE, and metal pipe, the test requirements are per ASTM D 3212.

**Deflected Joint Hydrostatic Plant Test (Current FDOT Specification)**

Per the current Sections 430, 449, and 948, all pipe types are to be hydrostatically tests with joints in a deflected position. RCP and FCP pipes are tested per ASTM C443 with the joint deflected. PVC, HDPE, and metal pipe are to be tested per ASTM D3212, which requires that the pipe be deflected to 5 percent of its diameter at a prescribed distance from the end of the pipe (per Figure 2. Shear Deflection Test of ASTM D 3212).

**Proposed Hydrostatic Test for Metal Pipe**

The proposed deflected joint hydrostatic test procedures for PVC, HDPE, RCP, and FCP pipe will remain unchanged from the current specifications. However, the proposed hydrostatic joint test procedure for metal pipe no longer requires that the pipe joint be tested in a deflected position, as is the case for all other pipe types. In the proposed metal pipe specification, sections

7.3 and 7.4 of ASTM D3212 are excluded and an alternate test methodology to that of section 7.4 (depicted in Figure 2 of ASTM D3212) is proposed.

The proposed hydrostatic test for metal pipe does not deflect the pipe joint, but instead applies a parallel plate load longitudinally along the pipe and spanning the pipe joint. The Department is proposing to follow testing methods of ASTM D 2412 (Determination of External Loading Characteristics for of Plastic Pipe by Parallel-Plate Loading) in the application of the longitudinal load.

The Department is mis-applying ASTM D 2412 for the purpose of hydrostatic joint testing of metal pipe. ASTM D 2412 clearly states in sections 1 (Scope) and 5 (Significance and Use) that “the test method covers the determination of load-deflection characteristics of plastic pipe...” and that “properties of plastic pipe obtained by this test method are used for ... stiffness of the pipe ... load-deflection characteristics ... compare the characteristics of various plastics ... study the interrelations of dimensions and deflection properties of plastic pipe ... and ... measure the deflection and load-resistance at...significant events...during the test.” There is no mention of joint hydrostatic performance in ASTM D 2412.

By applying the proposed parallel-plate load across the metal pipe joint, instead of behind the joint per ASTM D 3212, the Department is lowering the standard of joint performance requirements for metal pipe. Flexible pipe, including metal pipe, can be subjected to point load distortions, and it is conceivable that such point loads occur at the vicinity of a metal pipe joint. It is possible that bedding behavior during or after construction impact the alignment of pipe either along its barrel or at its joint. It is also inherent behavior of metal pipe to deflect, and such deflection could occur at various degrees adjacent to the joint (as opposed to uniformly along the barrel and spanning the joint).

The proposed joint test procedure for metal pipe seemingly ignores the potential of point loads or alignment shift at the joint because it applies only a continuous longitudinal load that spans the joint. If the proposed amendment to section 943 is approved, the joint performance standards for RCP, FCP, PVC, and HDPE pipe will be more stringent because of their continued requirement to hydrostatically test the pipe joint in a misaligned, deflected position per ASTM C 443 or D 3212 as appropriate.

Furthermore, if approved, the Department will be mis-representing, and potentially over-stating, the capabilities of the metal pipe joint without placing limitations on where metal pipe can be installed.

### **FDOT Justification Requested**

Based on these comments and supporting information above, the Concrete Pipe Division of Rinker Materials respectfully requests the Department to justify the relaxation of the deflected joint testing requirement of ASTM D 3212 for metal pipe and the intended use of ASTM D 2412 for the metal pipe test procedure.

It is our position that the current application and enforcement of joint hydrostatic tests in the plant (straight and deflected alignments) based on ASTM C 443 and D 3212, as appropriate, provides the Department with a more equitable and scientifically justifiable protocol.