

9600000 POST-TENSIONING COMPONENTS  
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Paul Vinik  
352-955-6686  
[paul.Vinik@dot.state.fl.us](mailto:paul.Vinik@dot.state.fl.us)

Comments: (5-27-15)

1. Should 2.2.1.4 and 2.2.1.5 be subarticles of 2.2.1.3? Also, schedule 40 pipe has a working of pressure of 150 psi and is often called class 150 pipe (ANSI B36.10). I don't think 990-2.2.1.5(4) is necessary.

→	→	→	→	<b>960-2.2.1.3 Steel Pipe:</b>
→	→	→	→	Where specified in the Contract Documents <del>and in all deviation blocks</del> , steel pipes shall be <b>Schedule 40</b> and galvanized in accordance with Section 962.
→	→	→	→	<b>960-2.2.1.4 Minimum Internal Diameter:</b>
→	→	→	→	<del>(a) 1.</del> For prestressing bars, duct shall have a minimum internal diameter of 1/2 inches larger than bar outside diameter, measured across deformations.
→	→	→	→	<del>(b) 2.</del> For prestressing bars with couplers, duct shall have a minimum internal diameter of 1/2 inches larger than largest dimension of the largest enclosed element.
→	→	→	→	<del>(c) 3.</del> For multi-strand tendons, ducts must have a minimum cross-sectional area 2-1/2 times PT steel cross-sectional area.
→	→	→	→	<b>960-2.2.1.5 Connections, Fittings, and Tolerance:</b>
→	→	→	→	<del>(a) 1. Corrugated plastic duct connections shall be from polyolefin or polypropylene material.</del>
→	→	→	→	<del>(b) Devices or methods (e.g., mechanical duct couplers, plastic heat shrink sleeves) for all duct connections (e.g., splices, joints, couplers, connection to anchorages), shall produce smooth interior alignment with no lips or kinks.</del>
→	→	→	→	<del>(c) 2. Use of tape is not permitted to join or repair duct, to make connections, or for any other purpose.</del>
→	→	→	→	<del>3. Use a reducer when adjacent sections of duct are directly connected to each other and the outside diameters vary more than plus or minus 0.08 inch.</del>
→	→	→	→	<del>4. Provide all connections with a minimum working pressure rating of 100 psi.</del>
→	→	→	→	<del>5. Use heat shrink sleeves and circular sleeve couplers made from polyolefin or polypropylene material, or duct couplers made from polyolefin or polypropylene</del>

2. **960-2.2.1.7(1) “O”-Rings:**

Should this be the thickness of the “O” ring rather than the cross section diameter? I am confused.

→	→	→	→	<b>960-2.2.1.7 “O”-Rings:</b>
→	→	→	→	<del>(a) 1. “O”-rings with cross section diameters less than or equal to 0.25 inches and compression seals for use with segmental duct couplers assemblies and segment seal mounting assemblies shall be polyolefin material or polypropylene material.</del>

Response:

3. **960-2.2.2.2 Inlets, Outlets, Drains, Valves, and Plugs:**

I recommend ¼ turn ball valves. I don't think we want to allow knife gate, plug valves, etc. These are more prone to locking up and often do not provide full volume flow without resistance like a ball valve.

→ → → **960-2.2.2.2 Inlets, Outlets, Drains, Valves, and Plugs:**  
→ → → → (a)1. Provide permanent ~~grout~~ inlets, outlets, ~~drains~~, valves, and threaded plugs made of nylon, polyolefin materials, or stainless steel.  
→ → → → (b)2. All inlets, ~~and~~ outlets, ~~and drains~~ shall have pressure rated mechanical shut-off valves or plugs.  
→ → → → (c)3. Inlets, outlets, ~~drains~~, valves, and plugs shall have a minimum pressure rating of 150 psi.  
→ → → → (d)4. Inlets and outlets shall have a minimum inside diameter of 3/4 inches for strand and 3/8 inches for single bar tendons and four-strand ducts.  
→ → → → (e)5. Drains shall have a minimum inside diameter of 3/8 inches. Locate drains, and inlets and outlets serving as drains, at the bottom of the duct cross section.  
→ → → → 6. Dual in-line mechanical shutoff valves are required for vertical ~~grouting-PT~~ systems.  
→ → → → (f)7. Specifically designate temporary items, not part of the permanent structure, on PT system drawings.

Response:

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Said I. Nour  
630-972-4025  
said.nour@dsiamerica.com

Comments: (6-30-15)

960-2.1.5 Dynamic test of unbonded anchorage. AASHTO section 10.3.2.2 requires the test to be done on a representative anchorage. It is our understanding that for multi-strand systems, one representative tendon size shall be sufficient. This is interpreted, for example, that a 19-0.6 tendon size is representative of all multi-strand tendon sizes 7-0.6 through 31-0.6 that use similar components of different sizes. Is that so?

Response:

960-2.2.1.5.5 The use of heat shrink is intended to make the connection air-tight without it. Heat shrink is expensive and labor intensive. If the proposed connection of a system is air-tight without the use of heatshrink, we believe the use of heatshrink should not mandatory. We recommend the text of the specifications be changed to... "Make all connections air-tight or use heat shrink sleeves and circular sleeve....."

Response:

960-2.2.1.5.6 Same as above, the use of heat shrink should not mandatory if the connection is air-tight. We recommend "Make all connections air-tight or use heat shrink sleeves with or without circular sleeve....."

Response:

960-2.2.1.5.8, 9, 10, 11 and 12 Regarding the use of EPDM to couple section of ducts or duct and pipe, it is our understanding that EPDM is not recommended for use with petroleum based

material according to the manufacturer. Did the department give a consideration to this issue?  
960-3.2.1.4 Is this necessary? A successful pressure test of 1.5 psi would typically ensure a system that can hold vacuum as well.

**Response:**

960-3.2.3: Much of the duct testing was written around qualifying bonded, corrugated duct of PP composition. HDPE pipe for external applications per ASTM D3035 have defined chemistries and sizes, and have been around for many years. There is little gained by having each supplier qualify the HDPE pipe specified, since it will be the same for every supplier. DSI would ask that the Department simply specify what resin should be used.

**Response:**

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