9600201 Post-Tensioning Components
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

D4

Comment: (11-9-12) D4 Const. has the following comment. If I understand, by this spec. change we are looking for a 3/8" passage to facilitate the use of the endoscope without having to drill at a later date. If this is the idea, I suggest you add text such that the alignent of the opening in the anchor cap and wedge plate will facilitate the use of the endoscope. This will insure you don't have the 3/8" openings in random locations.

Response: The proposed 3/8" hole is not intended to be used for inspection purposes with the grout cap in place, it is mainly intended to allow for better flow of grout from the duct into the grout cap. Thus no alignment criteria between the cap and wedge plate hole is required. If the grout cap were to be removed, the hole could be used for inspection however. No Change Made.

Drew Micklus

Comment: (11-9-12) 960-2.1 (a) FDOT should not specify anchorage materials. This material, A536 is a ductile-as-cast iron commonly used for bearing plates/trumplates and sometimes for wedge blocks. We use A536 Gr 80-55-06 for larger anchorage trumplates and our 4F15, A48 Cl 35B for smaller trumplates, but for our anchor blocks (wedge blocks) we manufacture by machining from steel bar AISI C1045/C1050 with a min 90ksi tensile. We do not use cast materials for our wedge plates since we have a more compact strand pattern and flatter wedge angle which after extensive testing we do not have sufficient safety/quality control with cast parts. As far as I know all suppliers machine their wedges from alloy steel bar with specific heat treat processes. Cast material is not suitable for wedges. For some applications (thread bars for example) nuts are machined from hex bar stock, bearing plates fabricated from Gr 36, 42 or 50 steel plate, etc. The exact materials should be left to the supplier to specify for the proper performance of his system, shall be clearly shown on the drawings and verified thru testing and quality control in production. Also, if FDOT specifies the material and there should be a failure, you may be exposed to some shared liability.

Response: Text has been revised as follows: Change Made.
(a) Construct anchorages from ferrous metal ~~per ASTM A536 Grade 65-45-12 minimum~~.

960-2.1 (c) Add that the average bearing stress is applicable for plate anchorages. and that Special Anchorage Devices (aka multi-plane anchorages) shall be qualified as such by test (AASHTO)

Response: This is already current and accepted practice thus no change is needed.

960-2.1 (f): please revise: For 7-strand tendon sizes and larger, secondary passageways shall be provided to allow grout to flow into the grout cap. The minimum area of the secondary passages way shall be $0.098in^2$ and may be shall be provided by no more than two passageways. NOTE: No need to specify how the passage is provide since we may have to slot the bearing plate if we cannot find enough room in the wedge plate. The suggested 0.098 comes from the sum of two ¼" diameter holes. Comment: Is this issue of foaming grout observed when there is a sufficiently large outlet located very close to the anchorage? I can understand if the venting is done entirely

through the wedges that the grout will be pushed thru at tremendous speed, but if there is a large diameter grout outlet at the anchorage I would not expect to see this high speed grout being force thru the wedges unless the large diameter outlet is closed (inadvertently?/blocked) or not provided at all. Would like to discuss this a little more with you before making this change

Response: The requirement for the use of a 3/8" diameter vent hole through the wedge plate is based on satisfactory grouting results from a recent project. On that project, an FDOT approved PT system and the current FDOT construction specifications for grout material and grouting practices were utilized. The approved PT system had a 3/8" diameter vent hole through the wedge plate and post grouting inspections revealed that the grout caps were consistently full or very nearly full of solid grout. On another recent project the same grout material and grouting specifications but a different PT system which does not have a vent hole through the wedge plates were utilized. On that project, post grouting inspection consistently revealed foamed or frothy grout in the grout caps. Based on these limited results, FDOT believes that one of the major factors contributing to the successful grouting of grout caps is the presence of a 3/8" minimum diameter vent hole through the wedge plate. FDOT would consider the use of a combination of two smaller round vent holes drilled through the wedge plate or two rectangular notches cut into the edge of the wedge plate, the sum of the areas of which approximate or exceed that of a single 3/8" diameter vent hole. Strength testing will be required to assure proper strength of the wedge plate for all vent hole configurations. Grouting performance testing will be required for any proposed alternate vent hole configuration. For a proposed alternate vent hole configuration to be approved, the results of grouting performance testing must conclusively show that full grouting of the cap can be achieved comparable to that seen when a 3/8" vent hole through the wedge plate is present. No Change Made.

960-2.2.2.1 Revise to require 3/8” min diameter vent hole for 7-strand tendon sizes and larger… Smaller holes to sufficiently vent 4 strand tendon anchorage caps are acceptable.

Response: Text has been revised as follows:
(f) Geometry of grout outlets must facilitate access for endoscope inspection directly behind wedge plate using a straight 3/8 inch diameter drill bit. For all PT systems other than 4 strand flat configurations, p*lace vent hole(s) of 3/8 inch minimum diameter through wedge plate to allow for passage of grout and inspection.*

960-2.4.3 We believe the correct bolt spec is **F**593, not **A**593

Response: Agree, the ASTM reference has been changed to **F**593.

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