September 19, 2002

MEMORANDUM

TO: District Structures Design Engineers
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         District and Central Office Construction Engineers
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FROM: William N. Nickas, State Structures Design Engineer

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SUBJECT: Temporary Design Bulletin C02-12
         Strategy 2 – Fully Grouted Tendons
         (Reference: New Direction for Florida Post-Tensioned Bridges – Corven
         Engineering, Inc)
         Effective 8/1/02

To emphasize the importance of the Department's new directions for post-tensioned structures which increase the durability and level of performance of these structures, the Department of Transportation is issuing Temporary Design Bulletins C02-11 thru 15.

Because of the corrosion found on insufficiently grouted tendons, the Department is issuing new policies that will assure fully grouted tendons during construction. These policies are outlined below and affect the Contractor's Shop Drawings, the Contractor's Grouting Plan, and the inspection of anchorage and tendon high points. The document containing each these requirements is listed in [] after each requirement.

1. Contract Plans and Details shall be consistent with new FDOT Standards and Specifications. [SDG 1.6]

2. The Contractor shall submit a complete grouting plan that shall include, but is not limited to: [Section B460]

    a. Type, quantity, and brand of materials used for grouting including all certifications required.
    b. Type of equipment furnished, including capacity in relation to demand and working condition, as well as back-up equipment and spare parts.
    c. General grouting procedure.
    d. Duct pressure test and repair procedures.
    e. Method to be used to control the rate of flow within ducts.
    f. Theoretical grout volume calculations.
    g. Types and locations of inlet and outlet pipes consistent with plan requirements.
    h. Duct cleaning methods prior to grouting (if required).
    i. Mixing and pumping procedures.
    j. Direction of grouting.
    k. Grouting process for each tendon on project including injection locations (low points), vent closure sequence, and time delayed grout phasing.
    l. Sequence of use of the inlets and outlet pipes.
    m. Procedure for handling blockages.
    n. Procedures for possible post-grouting repair.

3. Contractor's Shop Drawings shall conform to the requirements of Section B460 (Section 462 beginning July 2003) and shall include, but is not limited to the following: [B460]

    a. Post-tensioning systems to be used.
    b. Layout showing locations and geometry of ducts.
    c. Duct spacing and supports.
    d. Inlet and outlet locations.
    e. Stressing sequence.
    f. Inspection details.

4. Grout pumping rates and pressures shall be at a rate of 16 linear feet to 50 linear feet of duct per minute and shall not exceed 145 psi at the grout inlet. [Section B460]

5. A fluidity test using a minimum of 2 gallons of discharged grout from the grout outlet shall be performed using a flow cone. The grout efflux time shall not be less than the efflux time measured at the pump or the minimum acceptable efflux time. [Section B460]

6. Inspection for voids shall be performed at all tendon high points and anchorages using probes or endoscopes. Voids shall be repaired using vacuum grouting and the tendon shall be sealed using epoxy grout pour-backs and permanent grout caps. [Section B460]

7. All grout inlets and outlets shall be sealed with threaded plugs and shall be rated for a minimum pressure of 150psi. Grout inlets, outlets, valves, and plugs shall conform to the Specifications. [Section B460]

WNN/ph