Florida Department of Transportation

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Tallahassee, FL 32399-0450

STEPHANIE KOPELOUSOS
SECRETARY

August 11, 2008

Dr. Leslie McCarthy, PhD, P.E.
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section 416
Proposed Specification: 4160600-Installing Adhesive-Bonded Anchors and Dowels for Structural Applications

Dear Dr. McCarthy:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.
Please review and transmit your comments, if any, within four weeks. Comments should be sent via Email to ST986RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4110.

Sincerely,

Rudy Powell, Jr., P.E.
State Specifications Engineer

RP/dm
Attachment
cc: Gregory Jones, General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer

**INSTALLING ADHESIVE-BONDED ANCHORS AND DOWELS FOR STRUCTURAL APPLICATIONS.**
**(REV 7-8-08)**

ARTICLE 416-6 (page 414) is deleted and the following is substituted.

**416-6 Testing of Anchors or Dowels.**

Field test installed anchors and dowels for traffic railing barrier applications using Type HSHV adhesives. The Engineer may also require testing of installed anchors and dowels for other applications. ~~Testing must be conducted by an Independent Testing Agency approved by the Engineer~~.

**416-6.1 Field Testing:** Provide a*n* ~~qualified professional~~ Independent Testing Agency to perform field testing of the installed anchors and dowels ~~in accordance with the applicable sections of ASTM E 488 and ASTM E 1512, in the presence of the Engineer~~ *under the direction of a Professional Engineer registered in the State of Florida*. *Submit test reports for each LOT signed and sealed by the Professional Engineer.* Perform restrained static tension tests to prevent damage to the surrounding concrete. *A restrained test is defined as a test conducted in accordance with ASTM E 488 except that the test equipment support clearance requirements of ASTM E 488 do~~*n*~~ *not apply. The reaction base shall be approximately equal to the drilled hole diameter for the anchor to preclude concrete or masonry failure, but allow bond failure.* Displacement measurement for field testing is not required. Test individual anchors and dowels by proof loading in tension to 85% of the Specified Bond Strength in Section 937, based on the nominal anchor or dowel diameter and embedment depth, but not more than 90% of the yield strength of the anchor or dowel~~. *However, the pulling force (lbs.) for proof loading of base plate anchor bolts in Design Standard Index No. 470, Traffic Railing (Thrie-Beam Retrofit), and for Dowel bars in Design Standard Index No. 480, Traffic Railing (Vertical Face Retrofit), shall be as specified under Adhesive-Bonded Anchors and Dowels of the Traffic Railing Notes*~~, unless otherwise shown in the Contract Documents.*

Divide the anchors and dowels into LOTs for testing and acceptance. Each LOT must contain a maximum of 100 anchors or dowels, of the same diameter, embedment length and Adhesive Bonding Material System. Randomly select four of the anchors and dowels in each LOT for testing, except if there are three or less in the LOT, in which case, test all anchors ~~*in accordance with ASTM E 488*~~, unless otherwise directed by the Engineer. If three consecutive LOTs have no failing tests, sample the next three LOTs at a 2% rate and if these LOTs have no failing tests, sample at a rate of 1% for the remaining LOTs unless there is a failure; however, regardless of LOT size, sample at ~~less~~ *least* one dowel per LOT. For every failed field test, perform two additional field tests on adjacent untested anchors or dowels within the LOT. Continue additional field tests until no more test failures occur, or all anchors and dowels within the LOT are tested. For the next LOT after a failed LOT, the sampling rate must be 4% but not less than one dowel per LOT and conform to the sampling rate procedure above including rate reductions as appropriate. ~~Determine failure of the field test~~ *Test the anchors and dowels* ~~in accordance with ASTM E 488. Submit certified test reports from the Independent Testing Agency to the Engineer for each LOT.~~

**416-6.2 Removal & Replacement of Failed Test Specimens:** Remove all anchors and dowels that fail the field test, without damage to the surrounding concrete. Redrill holes to remove adhesive bonding material residue and clean in accordance with 416-4. Reinstall new anchors and dowels in accordance with 416-5. Do not reuse the failed anchors and dowels unless approved by the Engineer. Assign reinstalled anchors into new LOTs only containing reinstalled anchors or dowels of the same diameter, embedment length and adhesive bonding material system, and field test in accordance with 416-6.1.

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**416-6.1 Field Testing:** Provide an Independent Testing Agency to perform field testing of the installed anchors and dowels under the direction of a Professional Engineer registered in the State of Florida. Submit test reports for each LOT signed and sealed by the Professional Engineer. Perform restrained static tension tests to prevent damage to the surrounding concrete. A restrained test is defined as a test conducted in accordance with ASTM E 488 except that the test equipment support clearance requirements of ASTM E 488 do not apply. The reaction base shall be approximately equal to the drilled hole diameter for the anchor to preclude concrete or masonry failure, but allow bond failure. Displacement measurement for field testing is not required. Test individual anchors and dowels by proof loading in tension to 85% of the Specified Bond Strength in Section 937, based on the nominal anchor or dowel diameter and embedment depth, but not more than 90% of the yield strength of the anchor or dowel, unless otherwise shown in the Contract Documents.

Divide the anchors and dowels into LOTs for testing and acceptance. Each LOT must contain a maximum of 100 anchors or dowels, of the same diameter, embedment length and Adhesive Bonding Material System. Randomly select four of the anchors and dowels in each LOT for testing, except if there are three or less in the LOT, in which case, test all anchors, unless otherwise directed by the Engineer. If three consecutive LOTs have no failing tests, sample the next three LOTs at a 2% rate and if these LOTs have no failing tests, sample at a rate of 1% for the remaining LOTs unless there is a failure; however, regardless of LOT size, sample at least one dowel per LOT. For every failed field test, perform two additional field tests on adjacent untested anchors or dowels within the LOT. Continue additional field tests until no more test failures occur, or all anchors and dowels within the LOT are tested. For the next LOT after a failed LOT, the sampling rate must be 4% but not less than one dowel per LOT and conform to the sampling rate procedure above including rate reductions as appropriate.

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