

State of Louisiana  
Department of Transportation and Development (DOTD)  
Materials and Testing Section Approved Materials Procedure  
for

**CONCRETE ANCHOR SYSTEMS**

**MATERIAL SPECIFICATION REFERENCE:**

DOTD Standard Specifications Section 1017, Subsections 601.03.8.6, 601.03.8.8.8, 602.08, 1018.08, Supplemental Specifications and Special Provisions. For epoxy anchoring applications, the epoxy shall be evaluated by the AASHTO National Transportation Products Evaluation Program (NTPEP) and comply with ASTM C881 (with the exception of the gel time requirement) and ICC-ES AC 308.

**APPROVED MATERIAL EVALUATION SUBMITTAL:**

The manufacturer shall submit a completed Approved Materials Evaluation Submittal to the DOTD Materials and Testing Section Coordinator listed below.

**PRELIMINARY REQUIREMENTS:**

The complete submittal must include:

- Complete Approved Materials Evaluation Form
- Letter requesting evaluation of the material or system
- Product Data Sheets
- Manufacturer's specifications
- Safety Data Sheet (SDS)
- Sample
- Independent Laboratory Test Results
- AASHTO NTPEP Results

The address of the contact affiliated with AASHTO NTPEP is:

NTPEP Coordinator  
AASHTO National Transportation Products Evaluation Program  
444 N. Capitol St. N.W.  
Suite 249  
Washington, D.C. 20001  
Phone: (202) 624-3695  
Fax: (202) 624-5806  
<http://data.ntpep.org>

For detailed information, refer to the Operational Procedures of the AASHTO NTPEP available from the NTPEP Coordinator.

NOTE: Evaluation will not begin until all required items listed above are received by the Materials Laboratory

## **PRELIMINARY REQUIREMENTS CONTINUED:**

### Certifications and/or Test Reports

Prior to submitting an "Approved Materials Evaluation Form" to the Materials and Testing Section, the manufacturer shall have successfully completed the requirements of the AASHTO NTPEP for Epoxy and Resin Based Adhesive Bonding Systems. The laboratory results obtained from the AASHTO NTPEP report will be used to determine conformance to DOTD Standard Specification. Grout and mechanical concrete anchoring systems are not subject to this requirement.

The manufacturer shall provide a Certificate of Analysis (CA) from an independent laboratory showing the required physical and chemical properties for all materials or systems in accordance with LA DOTD's Standard Specifications.

Product Data Sheets shall provide all pertinent information relative to the material or system to be evaluated, including but not limited to:

- Manufacturer's specifications
- Intended use of the system
- Material or system limitations:
  - Hole diameter tolerances
  - Hole spacing limitations
  - Moisture limitations
- Anchoring instructions
- Available sizes
- Embedment depths (if applicable)
- Ultimate pull-out and shear test results of anchors installed in 4,000 psi minimum concrete

### Sample (to be furnished at no cost to the Department)

For each system to be evaluated, the manufacturer shall submit three (3) ½ inch diameter anchors and three (3) ¾ inch diameter anchors to be embedded into hardened concrete (minimum 4,000 psi) in accordance with the manufacturer's written specifications for ultimate pull-out testing.

For systems which include an anchor bolt, an additional sample of the ½ inch and ¾ inch bolts will be required.

For anchoring deformed bars or bolts using either epoxy resin or grout, the manufacturer shall submit a minimum of a one (1) quart sample of each component of epoxy or a minimum of a one (1) gallon sample of grout respectively for verification testing according to the manufacturer's data sheets. Additionally, submit three (3) No. 4 deformed bars 28 inches in length conforming to ASTM A615 threaded a minimum of 6 inches on one end with two (2) nuts and two (2) washers attached for the ultimate pull-out test.

## **PRELIMINARY REQUIREMENTS CONTINUED:**

### Concrete Slab or Block

The manufacture shall provide a concrete slab or block meeting the following requirements:

- Minimum compressive strength of 4,000 psi. verified by at least two (2) 6 inch x 12 inch or three (3) 4 inch x 8 inch concrete cylinders cast during the pouring of the slab or block.
- Shall have adequate surface area and depth to perform the ultimate pull-out tests
- Shall be located locally with access to electricity and air compressor
- The manufacturer shall provide any special tools and equipment needed for the evaluation
- Cost and disposal of the concrete slabs will be borne by the manufacturer

## **TEST REQUIREMENTS:**

### Laboratory Testing

The ½ inch bolt and ¾ inch bolt or deformed bar will be tested for tensile and chemical properties by the Materials and Testing Section. The epoxy and grout will be verified by compressive strength and chemical composition.

### Field Testing

The manufacturer may elect to choose a private, local laboratory or ready mix plant to perform the preliminary tests required by the Department. The DOTD Coordinator and manufacturer's representative will coordinate a date and time to be present to witness the installation of the system. Prior to the evaluation, special adaptors or other tools which may be required for the installation shall be delivered to the testing site. The manufacturer's representative is responsible for the installation of the anchor system, hydraulic jack calibration, schedule and pertinent information for the DOTD Coordinator's review. The manufacturer's representative shall ensure proper installation and handling of the material or system.

Concrete anchoring systems will be anchored in a concrete slab or block conforming to the requirements listed above and ultimate pull-out testing will be conducted in accordance with the manufacturer's specifications. The ultimate pull-out strength obtained from the field test will be compared to and verified with the manufacturer's ultimate pull-out strength data provided. All anchors will be tested for ultimate pull-out resistance individually. The ultimate load carried by each anchor will be reported as well as the mode of failure. The yielding or fracture of any component of the anchor system or failure of the bond between the anchor and test slab regardless of the pull-out loads obtained will be considered a valid test.

Acceptance of the anchor system will be subject to the following:

- Conformance of the anchor bolt's tensile and coating properties with the manufacturer's specifications.
- Conformance of the Materials and Testing Section's pull-out tests with a minimum of 90% of the manufacturer's ultimate pull-out results for ½ inch and ¾ inch installed anchors.

### **TEST REQUIREMENTS CONTINUED:**

The mode of failure may occur by one or a combination of the following:

- Failure of the concrete test slab.
- Bond failure between the anchor and test slab.
- The yielding or fracture of any component of the anchor system.
- Failure the ½ inch anchor, ¾ inch anchor or deformed bar will result in rejection of the system.

During the ultimate pull-out tests, failure of the concrete test slab or block at loads less than 90% of the manufacturer's ultimate strengths will render the test invalid, and the results will be discarded. If all three pull-out tests are invalid for any one size, a retest of three additional pull-out tests per size will be allowed.

#### Evaluation Time (3 Months)

### **GENERAL:**

Upon completion of the evaluation, the submitter will be notified in writing concerning the results of the evaluation and whether the material or system will or will not be added to the Approved Materials List (AML). The DOTD Materials and Testing Section Coordinator shall be notified in writing of any change from the original material or system submittal. The Department reserves the right to re-evaluate any material or system at any time. A Certificate of Analysis (CA) of the material or system shall be submitted every two (2) years to the DOTD Materials and Testing Section Coordinator to remain on the AML.

It is also the manufacturer's responsibility to supply the contact information of the representative responsible for the material to the Materials Section Coordinator to remain on the AML. This is done by completing the Approved Materials Evaluation Form every two (2) years or when there is a change in the manufacturing representative responsible for the material.

### **PROJECT ACCEPTANCE REQUIREMENTS:**

The inclusion of any material or system on the AML is not blanket approval for its use. All systems, regardless of prior approval, shall be sampled in accordance to the Materials Sampling Manual.

### **DISQUALIFICATION AND REMOVAL:**

Any material or system may be removed from the AML at any time. Causes for removal from the AML may include, but are not limited to:

- Non-conformance with specifications
- Performance requirements
- Failure to notify the Department of any change in material or system formulation
- Failure of the supplier to provide proper certifications as required by this procedure
- Failing test results obtained by the Materials Section of project verification samples
- Failure to supply current contact information for the material representative in accordance with this procedure

**REQUALIFICATION:**

Any material or system which has been disqualified and/or removed from the AML will be considered for re-evaluation only after submission of a formal request along with acceptable evidence that the problems causing the disqualification and/or removal have been resolved.

**DOTD MATERIALS AND TESTING SECTION COORDINATOR:**

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Approved 05/24/17

A handwritten signature in black ink, appearing to read "B. Owens", is positioned below the approval date.

BRIAN OWENS, P.E.  
DOTD MATERIALS ENGINEER ADMINISTRATOR