



**INDIANA DEPARTMENT OF TRANSPORTATION  
DIVISION OF MATERIALS AND TESTS**

**LABORATORY TESTING OF  
CHEMICAL ANCHOR SYSTEMS  
ITM No. 807-20**

**1.0 SCOPE.**

- 1.1 This test method covers the procedure for the laboratory testing of chemical anchor systems by installing grade 60, #7 epoxy coated deformed steel reinforcing bar and applying a tensile load equal to the yield of the reinforcing bar.
- 1.2 This ITM may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and determining the applicability of regulatory limitations

**2.0 TERMINOLOGY.** Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101, and the following:

- 2.1 Chemical anchor system. A high strength adhesive material used to chemically anchor steel reinforcing bar into concrete.
- 2.2 Proof load. The yield of a grade 60, #7 epoxy coated deformed steel reinforcing bar.

**3.0 SIGNIFICANCE AND USE.** This ITM is often used to confirm the minimum tensile load required for chemically anchored steel reinforcing bars.

**4.0 APPARATUS.**

- 4.1 Rotary Impact Hammer Drill.
- 4.2 Spacer, 10 in. thick metal plate used to raise the height of the hydraulic ram.
- 4.3 Hydraulic Ram.
- 4.4 Interface 100,000 lb Load Cell Device.
- 4.5 Air compressor or vacuum source of sufficient force to clean the concrete dust from drilled holes.
- 4.6 Plastic Bottle Washer Brush.

- 4.7 Two, grade 60, #7 epoxy coated deformed steel reinforcing bars, 36 in. in length. The top 3 in. are machine threaded to nine threads per inch.
- 4.8 High strength nut, minimum Rockwell hardness of 25, 7/8 in, threaded to nine threads per inch.

## 5.0 PREPARATION OF TEST SPECIMEN.

- 5.1 A concrete block shall be used to anchor a size #7 reinforcing bar. The block shall be at least 28 days old with a minimum compressive strength of 4000 psi and have a smooth formed surface for reinforcing bar installation.
- 5.2 Drill two holes using a rotary impact hammer drill in the concrete block. The holes are typically 1 inch in diameter and 9 inches in depth. The minimum spacing between bars and distance from the edge of the block shall be a minimum of 75% of the embedment depth.
- 5.3 Remove the concrete dust with the high pressure air hose and or a vacuum. Dislodge the debris from the sides of each hole with the plastic bottle washer brush. Once the dust and debris have been removed use the high pressure air hose and or vacuum a second time to remove remaining concrete dust. The hole is required to be completely clean to facilitate installation of the chemical anchor system.

## 6.0 PROCEDURE.

- 6.1 Chemically anchor two, grade 60, #7 epoxy coated deformed steel reinforcing bars in accordance with the manufacturer's instructions
- 6.2 Allow the chemically anchored steel reinforcing bars to cure for 7 days at room temperature
- 6.3 Place the 10 in. spacer over the steel reinforcing bar level with the concrete surface. Shims may be used to level the plate
- 6.4 Place the hydraulic ram over the steel reinforcing bar onto the top of the 10 in. spacer.
- 6.5 Place the load cell device over the steel reinforcing bar onto the top of the hydraulic ram. This action should display only the top treaded portion of the steel reinforcing bar. Additional spacers may be used, if necessary.
- 6.6 Place a washer over the steel reinforcing bar positioned between the load cell device and the high strength 7/8 in. nut.

- 6.7** Attach the high strength 7/8 in. nut to the exposed threaded portion of the steel reinforcing bar.
- 6.8** Apply a tensile load at 7,200 lbs/min until the load reaches 36,000 lbs, the yield of a #7 bar.
- 6.9** Release the load and remove the high strength nut, washers, load cell device, hydraulic ram, and the spacer(s).
- 6.10** Repeat 6.3 through 6.9 for the second steel reinforcing bar.

**7.0 Report.**

- 7.1** The proof load or the maximum load achieved if less than the proof load is reported.

