



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

**REINFORCING BAR, DOWEL BAR, AND
WELDED WIRE REINFORCEMENT
CERTIFICATION PROGRAM
ITM No. 301-19**

1.0 SCOPE.

1.1 The Indiana Reinforcing Bar, Dowel Bar and Welded Wire Reinforcement Certification Program is a program in which the reinforcing bar and dowel bar manufacturer, welded wire reinforcement fabricator, and the fusion bonded epoxy coater are responsible for the compliance of their product in accordance with contract requirements. The Department monitors the manufacturer, fabricator, and epoxy coater certifications by random verification sampling and testing.

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 prior to use.

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

2.1 Certified Mill Analysis. A document provided by the manufacturer which lists all chemical and physical test results as required by the applicable specifications. The manufacturer name and address, type and grade for reinforcing bar, diameter and grade for dowel bars, heat number, and any other data deemed necessary by the manufacturer shall be included.

2.2 Manufacturer. Reinforcing bar or dowel bar rolling mill

2.3 Coater. Fusion bonded, epoxy applicator plant

2.4 Manufacturer Classification. The manufacturer shall be either Certified or Non-Certified.

2.5 Coater Classification. The coater shall be Certified or Non-Certified.

2.6 Certified Manufacturer. A manufacturer that has met the requirements for certification and is allowed to supply reinforcing bar and dowel bars to Department contracts.

- 2.7 Non-Certified Manufacturer. A manufacturer that does not meet certification requirements or has been removed from certification status
 - 2.8 Certified Coater. An applicator plant of epoxy coating that is certified by the Concrete Reinforcing Steel Institute (CRSI)
 - 2.9 Non-Certified Coater. An applicator plant of epoxy coating that does not meet certification requirements or has been removed from certification status
 - 2.10 NTPEP. The AASHTO National Transportation Product Evaluation Program
 - 2.11 CRSI. The Concrete Reinforcing Steel Institute
 - 2.12 Fabricator. Facility which welds wire materials to form WWR. A fabricator may also produce drawn wire or use wire produced elsewhere.
 - 2.13 WWR. Welded Wire Reinforcement as defined by the Wire Reinforcing Institute.
- 3.0 **SIGNIFICANCE AND USE.** The Reinforcing Bar, Dowel Bar and Welded Wire Reinforcement Certification Program is a program whereby the Producer takes responsibility for the production and coating of quality reinforcing and dowel bars and welded wire reinforcement in accordance with specification requirements and the Department monitors the Producer quality control procedures.
- 4.0 **CERTIFICATION PROCEDURE FOR MANUFACTURERS AND FABRICATORS.**
- 4.1 **General.** Certification shall be based on satisfactory completion of the applicable audit program administered by NTPEP for rolling mills and WWR fabricators, satisfactory comparison of test results between the manufacturer laboratory and the laboratory designated by NTPEP, and satisfactory compliance to stated conditions for random samples taken from materials at the job-site. Test data from the laboratories shall compare within the limits specified.
 - 4.2 **Manufacturer Certification.** To be considered as a Certified Manufacturer of reinforcing bars and dowel bars, the mill shall meet the following criteria:
 - 4.2.1 A letter requesting certification shall be submitted to the Division of Materials and Tests.
 - 4.2.2 The manufacturer shall have satisfactorily completed two consecutive NTPEP audits

- 4.2.3** The results between the manufacturer and NTPEP testing facility shall be within the following tolerances for companion samples.

Test	Difference in Test Results
Unit Weight	1 %
Yield*	10 %
Tensile	10 %
Elongation	4%

* Yield requirements will be waived for coiled reinforcing steel due to cold working when straightening

If more than 90 percent of comparable test values are within the limits for unit weight, yield, tensile, elongation, and deformation height, the manufacturer shall pass the laboratory comparison requirements. This requirement applies to individual test results only.

The manufacturer will be allowed a maximum of one average test result per heat to be less than the Department Standard Specification minimum requirements as tested at either laboratory. No test sample shall fail the bend test.

- 4.2.4** The manufacturer shall submit to the Department a legible image in electronic format depicting the producing mill designation in accordance with the CRSI Manual of Standard Practice Section for Identification Marks. The Materials Services Engineer will determine if the electronic format provided is suitable for Department needs. Alternately, the mill may submit identification markings in accordance with NTPEP requirements.

- 4.3 Fabricator Certification.** To be considered as a Certified Fabricator of WWR, the fabricator shall meet the following criteria:

- 4.3.1** A letter requesting certification shall be submitted to the Division of Materials and Tests.
- 4.3.2** The fabricator shall have satisfactorily completed two consecutive NTPEP audits.
- 4.3.3** The results between the fabricator and NTPEP testing facility shall be within the following tolerances for companion samples.

Test	Difference in Test Results
Unit Weight (deformed wire)	5 %
Wire Diameter (smooth wire)	5 %
Tensile	10 %

If 90 percent or more of comparable test values are within the limits for unit weight, wire diameter, and tensile, the fabricator shall pass the laboratory comparison requirements.

The fabricator will be allowed a maximum of one average test result per set of samples to be less than the Department Standard Specification minimum requirements as tested at either laboratory. No test sample shall fail the bend test or weld shear test.

4.4 **Provisional Certification.**

A Manufacturer or Fabricator may apply for provisional certification after successfully completing one NTPEP audit. In addition, specimens shall be submitted to the Department as follows:

- 4.4.1** Manufacturers shall submit nine specimens to include three specimens each from three different heats and diameters as shown in the table below. No more than one heat shall be the same as those specimens sampled for NTPEP audit comparison testing. The Department will choose which diameters will be sampled.

Sample No.	Specimen Dia. A	Specimen Dia. B	Specimen Dia. C
1	Heat no. 1	Heat no. 2	Heat no. 3
2	Heat no. 1	Heat no. 2	Heat no. 3
3	Heat no. 1	Heat no. 2	Heat no. 3

Each Manufacturer specimen shall be 12 ft in length, consisting of two 6 ft pieces. One piece shall be tested by the Manufacturer and one piece will be tested by the Department. Each of the nine Manufacturer specimens shall be marked with a different identifying label which shall be the same for the adjacent pieces divided for testing by the Manufacturer and the Department.

- 4.4.2** The Manufacturer shall enter test results on the Reinforcing Bar Manufacturer Certification Form (Attachment A) and submit the completed form to the Department with the specimens for testing. Test results between the Manufacturer and Department laboratories shall be in accordance with 4.2.3.
- 4.4.3** Fabricators shall submit three specimens, each with a different longitudinal wire diameter. The horizontal diameter shall also vary among the specimens, if available. No more than one specimen shall be the same as those sampled for NTPEP audit comparison testing. Each Fabricator specimen shall be a minimum of 3 ft wide with no fewer than 4 longitudinal wires and shall be a minimum of 3 ft in length. Two specimens shall be provided. One specimen shall be tested by the Fabricator and one specimen will be tested by the Department.

Each of the specimens shall have the longitudinal wires marked with a different identifying label which shall be the same for continuing wires for both the Fabricator and Department specimens. (Fabricators may refer to the WWR sampling diagram in the NTPEP Reinforcing Steel and WWR work plan for wire designation.)

The Fabricator shall enter test results on the Welded Wire Reinforcement Fabricator Certification Form (Attachment B) and submit the completed form to the Department with the specimens for testing. Test results between the Department and Fabricator laboratories shall be in accordance with 4.3.3.

Provisional Certification shall be maintained as indicated in 4.5 and will be removed once the Manufacturer or Fabricator satisfactorily completes a second consecutive NTPEP Audit.

- 4.5 Maintaining Certification.** The Manufacturer or Fabricator is required to satisfactorily complete a NTPEP audit and comparison testing on an annual basis.

Samples of material may be obtained randomly for verification at the source or at the point of incorporation into the work. Manufacturers or Fabricators are subject to unannounced audits by the Department to verify continual compliance of the requirements of the NTPEP Audit Program Work Plan.

The Manufacturer or Fabricator shall provide written notification of any changes, revisions or updates of the Quality Management System (QMS), SDS, name, address, producing mill designation, or contact person to the Division of Materials and Tests.

- 4.6 Non-certification status.** A Manufacturer or Fabricator may be placed in non-certification status for, though not limited to, the following reasons:

- 4.6.1** Test failures determined by verification sampling
- 4.6.2** Failure to satisfactorily complete annual NTPEP audits
- 4.6.3** Failure to take corrective action for non-compliance following Department audits
- 4.6.4** Performance of product no longer meets the intended purpose
- 4.6.5** Failure to submit QMS revisions or other changes noted in 4.5 to the Division of Materials and Tests
- 4.6.6** Test reports which fail to meet the comparison requirements of 4.2.3 or 4.3.3

A non-certified Manufacturer or Fabricator may resubmit for certification with documentation indicating the quality improvements made to the manufacturing or fabrication process to improve the quality of the product. A surveillance audit performed by NTPEP or the Department may be required at the Manufacturer or Fabricator expense to verify the improvements. If satisfactory improvements are made, the Manufacturer or Fabricator will be placed in Provisional Certification until two consecutive satisfactory NTPEP audits have been completed. Section 4.2 or 4.3 requirements will be waived, unless they are necessary to determine if improvements are satisfactory.

- 4.7 Department Responsibility.** The Engineer will make a comparison between the bar identification marks, the Type B Certification provided by the bar fabricator or the manufacturer, and the invoice. All reinforcing bar and dowel bar materials shipped to Department contracts shall be accompanied by a certified mill analysis for each heat in the shipment. Under certified manufacturer status, reinforcing bars and dowel bars will be accepted based on these requirements. Periodic verification testing of random samples from the job-sites will be done.

Manufacturer plant facilities, witnessing of testing, and test records shall be accessible to the Department representative during normal working hours. The manufacturer shall be responsible for supplying material identification, certified mill analysis for all heats, and invoices to make identification of the materials sent to Department contracts.

5.0 CERTIFICATION PROCEDURE FOR COATERS.

- 5.1 General.** Certification shall be based on satisfactory compliance of epoxy coated reinforcing bars and dowel bars with specification requirements and satisfactory compliance to stated conditions for random samples taken from materials arriving at the job-site. The major consideration is the comparison of test data to specified product test limits. The methods of tests and specification requirements shall be in accordance with the applicable contract documents. The coater shall provide a list of source mills for the reinforcing steel to be coated as well as the coating material to be used. . Certified Coaters shall use reinforcing steel and coating material from the respective Department approved list.
- 5.2 Certification.** Under certified coater status, coated reinforcing bars and coated dowel bars will be accepted based on the coater's acceptance number issued by the Department. The coater shall be previously certified by the CRSI and in good standing at the time of acceptance. Proof of CRSI certification shall be provided to the Engineer. Certified coaters shall maintain all testing records for at least three years.
- 5.3 Department Responsibility.** All coated reinforcing bars, coated dowel bars

and coated WWR shipped to Department contracts shall be accepted by a Type A certification from the coater including the coating thickness and the adhesion tests and by a Type B certification for the reinforcing and dowel bars and for the WWR provided by the manufacturers or fabricators for each shipment. A Type C certification from the coater shall be furnished identifying the coating material used and stating that the coating material is from the Approved List of Epoxy Coatings for Steel. The Engineer will review all certification information and test results to assure that the submittal complies with contract specifications. Periodic verification testing of random samples from the job-sites will be done.

The Coater plant facilities, witnessing of testing, and test records shall be accessible to the Department representative during normal working hours. The coater shall provide all the documentation required for the reinforcing steel bars, dowel bars, and WWR and all of the coater documentation for each shipment.

5.4 Non-certification status. A Coater may be placed in non-certification status for, though not limited to, the following reasons:

5.4.1 Test failures determined by verification sampling

5.4.2 Failure to meet the CRSI audit requirements

5.4.3 Failure to take corrective action for non-compliance following field inspection of material

5.4.4 Performance of product no longer meets the intended purpose

5.4.5 Certifications provided in accordance with 5.3 indicate failing test results

A Coater that has been designated as non-certified may re-apply for certified status provided they demonstrate proof to the Department that the causes of the designation as non-certified have been corrected.

5.5 Maintaining Certification. The Coater is required to satisfactorily complete the CRSI Certification process on an annual basis.

Samples of material may be obtained randomly for verification at the source or at the point of incorporation into the work. Coaters are subject to unannounced audits by the Department to verify continual compliance of the requirements of the CRSI Certification Program.

The Coater shall provide written notification of any changes, revisions or updates of the coating material, SDS, name, address, producing mill designation, or contact person to the Division of Materials and Tests.

**INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS
REINFORCING BAR MANUFACTURER CERTIFICATION FORM**

Manufacturer Name: _____

Location: _____

Heat No.: _____ Type: _____ Grade: _____ Date: _____

PRODUCER TEST RESULTS				
Identification No.				Average
Designation No.				
Sample Weight, lb				
Sample Length, in.				
Unit Weight, lb/ft				
Yield Load, lbf				
Yield Strength, psi				
Maximum Load, lbf				
Tensile Strength, psi				
Elongation in, 8 in. %				
Bend Test, P/F				
Deformation Height, in.				

Manufacturer's Signature: _____

Testing Facility Signature: _____

Name of Testing Facility: _____

**INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS
WELDED WIRE REINFORCEMENT FABRICATOR CERTIFICATION FORM**

Fabricator Name: _____

Location: _____

Lot No./Production Run Designation: _____ Type: _____ Date: _____

PRODUCER TEST RESULTS					
Indicate Units	Include wire identification as necessary				Average
Sheet Size Designation					
Longitudinal Tensile, psi					
Transverse Tensile, psi					
Longitudinal Unit Wt., lb/ft					
Transverse Unit Wt., lb/ft					
Longitudinal Diameter, in.					
Transverse Diameter, in.					
Weld Shear, lbf					
Bend Test, P/F					

Manufacturer's Signature: _____

Testing Facility Signature: _____

Name of Testing Facility: _____