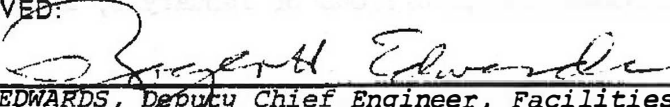


TO:	ENGINEERING INSTRUCTION NEW YORK STATE DEPARTMENT OF TRANSPORTATION	
Director SUPERSEDED BY EB 97-006 EFFECTIVE 2/14/97	SUBJECT: <i>LONGITUDINAL JOINT TIES</i> Subject Code: 7.27-2-502	
Distribution: <i>ROOM 408 BLDG.</i> <input checked="" type="checkbox"/> Main Office <input checked="" type="checkbox"/> Regions <input checked="" type="checkbox"/> Special	Code: <u>32-56</u> Date: <u>9/20/82</u>	
APPROVED:  R. H. EDWARDS, Deputy Chief Engineer, Facilities Design Division		Supersedes: EI 77-47

Investigation by the Materials Bureau indicates that some of the longitudinal joint ties failed due to corrosion. These failures are causing slab faulting and separation. In August of 1976 the Department began to allow Contractors to use corrosion resistant joint ties (epoxy coated) at their option.

It has been determined that the epoxy coatings, now specified on the corrosion resistant joint tie standard sheet, will prolong the life of cement concrete pavements at a minimal additional cost. Therefore, the following Standard Sheets and the instructions, general letters, or engineering instructions issuing them, as listed below are hereby rescinded and shall not be used in any contract commencing with the letting of December 9, 1982.

Standard Sheet 502-3, originally issued as Standard Structure Sheet 69-11 by Instruction 69-31.

Standard Sheet 502-4, originally issued as Standard Structure Sheet 69-11C by Instruction 69-49.

Standard Sheet 502-5, originally issued as Standard Structure Sheet 63-11W by General Letter 63-30.

Standard Sheet 502-6, originally issued as Standard Structure Sheet 68-11X by Instruction 68-55.

Standard Sheet 502-7R1, issued by Engineering Instruction 77-47.

Standard Sheet 502-8, issued by Engineering Instruction 76-56.

In their place, Standard Sheet 502-7R2 Longitudinal Joint Ties should be included in projects with Portland Cement Concrete pavement. This sheet depicts approved joint ties, all of which are epoxy coated and specified under pay items for Longitudinal Joint Ties and material specification 705-14 Longitudinal Joint Ties by the attached note.

PREL.	FINAL
DESIGN	LANDSCAPE
RECEIVED FACILITIES DESIGN DIVISION	
SEP 22 1982	
CIRC.	FILE

PORTLAND CEMENT CONCRETE PAVEMENT

LONGITUDINAL JOINT TIES

Make the following changes to the STANDARD SPECIFICATIONS of January 2, 1981:

Pg. 5-15

Add the following as the 10th line from the top of the page:

Longitudinal Joint Ties 705-14

Delete the 24th line from the top of the page which reads:

Corrosion Resistant Longitudinal Joint Ties

Pg. 5-19

Modify the first line to read as follows:

"...the dimensions shown on the Standard Sheets and the requirements of 705-14 - Longitudinal Joint Ties. Alternate tie bars which do not appear on the..."

In the 7 and 9 line from the top of the page delete the words:

"...expansion or..."

In the 11 line from the top of the page delete the sentence which reads:

When the expansion type is used, the tie bar shall be securely fastened.

Pg. 5-27

In the listing of payment items delete the following:

502.31 Longitudinal Joint Ties (Expansion Type) Each

705-14 - LONGITUDINAL JOINT TIES

SCOPE: This specification covers the requirements for Longitudinal Joint Ties (LJT) used in portland cement concrete pavements.

GENERAL: All Longitudinal Joint Tie systems not appearing on the standard sheets shall be tested and subject to approval before their use is allowed for Department work. Application for approval of such LJT systems shall be made to the Director, Materials Bureau. Systems found suitable shall be detailed by the Department on the appropriate standard sheet. Approved epoxy coatings, and epoxy coating applicators shall be listed on the Department's List of Approved Products. All requirements of this specification and any directives shown on the standard sheets or List of Approved Products shall apply.

MATERIAL REQUIREMENTS

- A. Longitudinal Joint Tie Material - All components of LJT systems shall be made of steel. Each component shall be capable of complying with the requirements stated in the following formula when the minimum numerical values for the steel used to manufacture the LJT in question are substituted in the formula:

$$F \times A \geq 10,000 \text{ pounds}$$

where: F = Minimum yield strength of the LJT component (psi)

A = Minimum cross sectional area of the LJT component (in²)

If the numerical values of the parameters fail to satisfy the requirement of the formula, the LJT system shall be rejected.

- B. Epoxy Coating Material - Epoxy coatings meeting the applicable requirements of Subsection 709-04 - EPOXY COATED BAR REINFORCEMENT, GRADE 60 and which appear on the Department's Approved List titled "Epoxy Coatings for Steel Reinforcing Bars" are acceptable. Epoxy coatings not tested under Subsection 709-04 shall be tested in accordance with this specification, and if found suitable will be approved and placed on the Department's Approved List titled "Epoxy Coatings for Longitudinal Joint Ties".
- C. Corrosion Inhibitive System For Threaded Ties - Approved corrosion inhibitive coatings for threaded portions of multiple piece LJTs shall comply with one of the following NYSDOT specifications:
1. Section 702 - BITUMINOUS MATERIALS:
Materials Designations 702-3201, 702-3301 or 702-3401 as defined in TABLE 702-5 ASPHALT EMULSIONS, MEDIUM SETTING.
 2. Subsection 708-03 - DULL ORANGE PRIMER.

Corrosion inhibitive coatings shall be applied to the threads when the LJT's are installed. The coating shall be applied in such a manner that an unbroken seal is formed to protect the ties from corrosion.

COATING APPLICATION REQUIREMENTS - All LJT systems supplied to the Department shall comply with all requirements listed below.

- A. Coating Applicator - The facilities of the coating applicator and the method of application for the epoxy shall be subject to approval by the Director, Materials Bureau. Upon approval, the complete name and address of the coating applicator will be placed on the Department's List of Approved Products titled "Epoxy Coatings for Longitudinal Joint Ties", or "Epoxy Coatings for Steel Reinforcing Bars".
- B. Surface Preparation of Metal - All surfaces of the LJT or its components shall be completely blast cleaned in accordance with Steel Structures Painting Council - Surface Preparation Specification No. 10 (SSPC-SP10), Near White Blast Cleaning. After blast cleaning, the cleaned surfaces of the LJT or its components shall be defined by, and comply with, SSPC-Vis 1, Pictorial Standards ASa 2½, BSa 2½, or CSa 2½, as applicable. The approved epoxy coating shall be applied to the cleaned surfaces as soon as possible after cleaning and before visible oxidation occurs. In no case shall more than eight (8) hours elapse between cleaning and coating.
- C. Coating Application - The coating shall be applied in accordance with the recommendations of the coating manufacturer and as approved by the Director, Materials Bureau.
- D. Coating Thickness - The epoxy coating shall be applied in a smooth uniform coat. After curing, the coating thickness shall be 7 ± 2 mils unless otherwise approved by the Director, Materials Bureau and published on the Department's List of Approved Products titled "Epoxy Coatings for Longitudinal Joint Ties". Coating thickness shall be determined and controlled by the coating applicator by taking measurements on a representative number of bars from each production run. Coating thickness measurements shall be conducted by the method outlined in ASTM G12.
- E. Continuity of Coating -
 1. The epoxy coating shall be visually checked for continuity after cure. It shall be free of holes, voids, contamination, cracks and damaged areas.
 2. The coating shall not have more than two holidays (pinholes not visible to the naked eyes) in any linear foot of coating length. A holiday detector shall be used, in accordance with the manufacturer's instructions, to check for holidays on a representative number of bars in each production run.

3. LJT's with uncoated areas within 2 inches from the ends of the ties due to handling during fabrication will be acceptable. The cross-sections of the ends of the fully assembled LJT systems may be uncoated.
- F. Coating Cure - Before shipment from the applicator's facilities, the coating applicator shall check each production run to determine that the LJT systems have fully cured coatings. The LJT's shall not be shipped until the epoxy coatings are fully cured.
- G. Shop Repair of Damaged Coatings - Epoxy coated LJT's that do not meet the requirements for Coating Thickness, Continuity of Coating, or Coating Cure shall not be repaired. Instead, LJT's with these defects shall be replaced or, alternatively, stripped of epoxy coating, re-cleaned and recoated in full conformance with the requirements of this specification.
- H. Field Repair of Damaged Coatings - LJT's with coating breaks, due to handling, that exceed 1/4" in any dimension shall not be incorporated into the pavement. Uncoated areas as defined in E.3. above are not cause for rejection and do not require repair.

The contractor shall set aside such damaged units and may effect a field repair. Coating breaks that exceed 1/4" in any dimension may be repaired with a patching material supplied by the epoxy coating manufacturer. The patching material shall be an epoxy compatible with the epoxy coating and inert in concrete. The repair material shall be applied only to the general area requiring repair. Dipping of the tie in repair material or liberal coating of undamaged areas shall not be allowed.

TESTING

- A. Quality Control - The coating applicator shall be responsible for performing quality control and tests. This will include inspection for compliance with the requirements of Coating Thickness, Continuity of Coating, and Coating Cure.
- B. Laboratory Testing - Unless otherwise stated, the following laboratory tests will be performed by the Materials Bureau on all LJT systems not appearing on the standard sheets and for epoxy coating systems not appearing on the Department's List of Approved Products.
 1. Pullout Test - Each epoxy coated LJT component, as well as the fully assembled and coated LJT system shall be capable of withstanding a minimum pullout force of 10,000 pounds without yielding. The pullout test shall be conducted in accordance with NYSDOT test method 705-E1 - LONGITUDINAL JOINT TIE TEST METHOD.

2. Corrosion Test - LJT epoxy coating systems shall be tested for corrosion resistance in accordance with the CORROSION TESTING procedure (Section VIII) of NYSDOT test method 705-E1 - LONGITUDINAL JOINT TIE TEST METHOD. The epoxy coating system shall survive a minimum of 25 freeze-thaw (FT) cycles. When viewed under 5 power magnification, the degree of corrosion observed shall be a rust grade of 10, or better, when rated in accordance with ASTM D610 EVALUATING DEGREE OF RUSTING ON PAINTED STEEL SURFACES.

For purposes of this testing, the LJT supplier shall provide the Director, Materials Bureau with three neat, clear, legible 8½X11" shop drawings depicting the LJT system. Twelve (12) LJT samples with epoxy coating shall be submitted for testing. Upon receipt of the samples and corresponding shop drawings, the samples will be examined and compared for dimensional conformance with the dimensions shown on the shop drawings. Any discrepancy shall be cause for rejection of the ties and no further testing shall be conducted.

BASIS OF ACCEPTANCE - Epoxy coated longitudinal joint ties shall be accepted by the Engineer at the contract site on the basis of the following:

1. The epoxy coating manufacturer's certification that the coating material is the same as that approved by the Materials Bureau.
2. The coating applicator's certification that the LJT's have been coated and tested and that they conform to the requirements of this specification.
3. The Longitudinal Joint Tie manufacturer's certification that the metal used conforms to the requirements of this specification. The ASTM Designation and Grade shall be included.
4. The appearance of the LJT system on the appropriate standard sheet or as approved by the Director, Materials Bureau.
5. The appearance of the name of the coating applicator and epoxy coating material on the Department's Approved List of Products.