**INDIANA DEPARTMENT OF TRANSPORTATION**
*Driving Indiana's Economic Growth*

100 North Senate Avenue
Room N925
Indianapolis, Indiana 46204

PHONE: (317) 232-5456
FAX: (317) 232-5551

**Michael R. Pence, Governor**
**Karl B. Browning, Commissioner**

# APPROVED MINUTES

## February 20, 2014 Standards Committee Meeting

APPROVED MINUTES

MEMORANDUM

March 27, 2014

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Meeting minutes from the February 20, 2014 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow at 09:02 a.m. on February 20, 2014 in the N955 Bay Window Conference Room. The meeting was adjourned at 11:13 a.m.

The following committee members were in attendance:

Greg Pankow*, Chairman, Construction Management Director
Bob Cales, Contract Administration Division
Dave Boruff, Traffic Engineering Division
Elizabeth Phillips, Bridges Division
Derrick Hauser**, State Construction Engineer
Jim Keefer, Fort Wayne District Construction Director
Michael Prather***, Pavement Engineering
Richard Vancleave, Highway Design and Technical Support Division
Tony Zander****, Materials Management

**Proxy for* Mark Miller
***Proxy for Greg Pankow*
****Proxy for Mike Buening*
****Proxy for Ron Walker

Also in attendance were the following:

Drew Storey, INDOT
Lalit Garg, INDOT (item 04)
Lana Podorvanova, INDOT
Nayyar Siddiki, INDOT
Todd Shields, INDOT
Wendy Chiles, INDOT
Steve Fisher, INDOT
Joe Hile, Specialties Company, LLC
Athar A. Khan, INDOT
Mohammad Hajeer, FHWA
Scott Trammell, INDOT

The following items were listed for consideration.

*A. GENERAL BUSINESS ITEMS*

OLD BUSINESS

*(No items were listed)*

NEW BUSINESS

*1. Approval of the Minutes from the December 19, 2013 meeting*

DISCUSSION: Mr. Pankow requested a motion to approve the minutes from the December 19, 2013 meeting.

Motion: Mr. Boruff
Second: Mr. Cales
Ayes: 8
Nays: 0

ACTION: PASSED AS SUBMITTED

*2. ORB Update* *(Ron Heustis)*

Note: Rescheduled for a later date.

*B. CONCEPTUAL PROPOSAL ITEMS*

OLD BUSINESS

*(No items were listed)*

NEW BUSINESS

*1. Editorial revision to Standard Drawing 601-TWGT-01 W-BEAM GUARDRAIL TO THRIE BEAM GUARDRAIL TRANSITION, WGT* *(Richard Vancleave, pg 03)*

Mr. Vancleave presented and explained the editorial revisions to the standard drawing that will be effective on September 01, 2015. There were no questions or comments.

*C. STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS PROPOSED ITEMS*

OLD BUSINESS

Item No. 01 12/19/13 (2014 SS) Ms. Phillips pg 06
*738-B-XXX* *POLYMERIC CONCRETE BRIDGE DECK OVERLAY*

ACTION: PASSED AS REVISED

APPROVED MINUTES

NEW BUSINESS

| | | |
|---|---|---|
| Item No. 01 02/20/14 (2014 SS) | Mr. Walker | pg 18 |
| 207.03 | General Requirements | |
| 207.04 | Subgrade Treatments | |
| 207.06 | Basis of Payment | |

ACTION: PASSED AS REVISED

| | | |
|---|---|---|
| Item No. 02 02/20/14 (2014 SS) | Mr. Walker | pg 25 |
| 215.01 | Description | |
| 215.02 | Materials | |
| 215.03 | Testing and Mix Design | |
| 215.05 | Weather Limitations | |
| 215.07 | Spreading of Chemical Modifiers | |
| 215.09 | Compaction | |
| *215.10* | *Curing* | |
| 215.~~10~~*11* | Method of Measurement | |
| 215.~~11~~*12* | Basis of Payment | |

ACTION: PASSED AS REVISED

| | | |
|---|---|---|
| Item No. 03 02/20/14 (2014 SS) | Mr. Walker | pg 32 |
| 913.04 | Lime | |

ACTION: PASSED AS SUBMITTED

| | | |
|---|---|---|
| Item No. 04 02/20/14 (2014 SS) | Mr. Boruff | pg 35 |
| *801-T-XXXd* | *LANE ENDS WARNING SIGNS* | |

ACTION: PASSED AS SUBMITTED

cc: Committee Members
FHWA
ICA

APPROVED MINUTES

CONCEPTUAL PROPOSAL ITEM 01

REVISION TO STANDARD DRAWING 601-TWGT-01 W-BEAM GUARDRAIL TO THRIE BEAM GUARDRAIL TRANSITION, WGT

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Inconsistent showing of post at the mid-span of the WGT thrie-beam transition rail on Standard Drawing 601-TWGT-01.

PROPOSED SOLUTION: See attached markups for proposed editorial revisions to Standard Drawing 601-TWGT-01. These revisions include removal of the post at the midspan of the thrie-beam transition rail, addition of text callouts in multiple drawing views, addition of arrows to show locations of sections, addition of note 5, corrections to language in notes, corrections to drafting of various elements (posts, etc.), and update of drawing format and title blocks.

APPLICABLE STANDARD SPECIFICATIONS: n/a

APPLICABLE STANDARD DRAWINGS: 601-TWGT-01

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: n/a

PAY ITEMS AFFECTED: n/a

Submitted By: Richard VanCleave

Title: Roadway Standards Engineer

Organization: INDOT

Phone Number: 232-5347

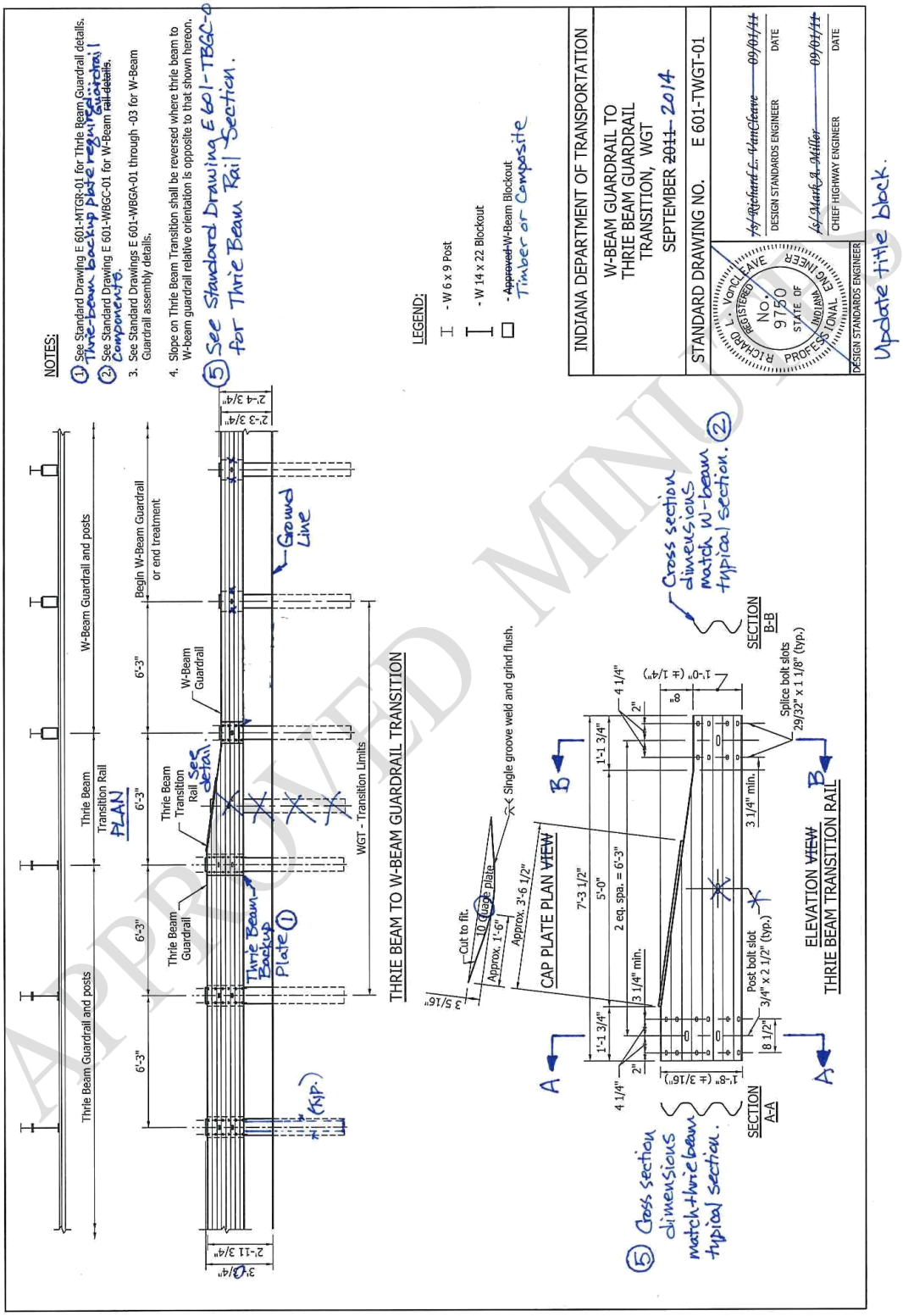
Date: Dec. 20, 2013

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

APPROVED MINUTES

CONCEPTUAL PROPOSAL ITEM 01 (continued)

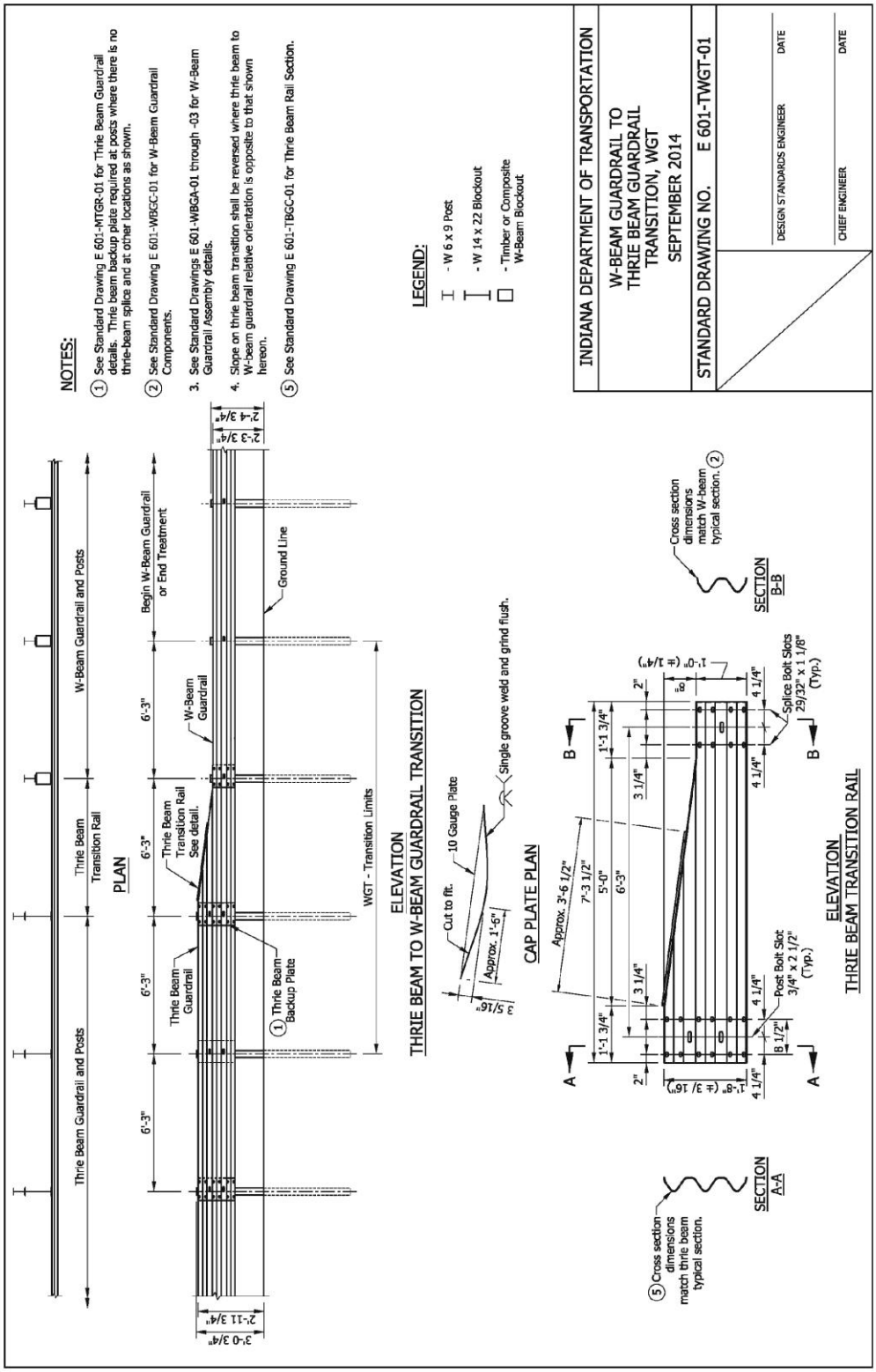
REVISION TO STANDARD DRAWING 601-TWGT-01 W-BEAM GUARDRAIL TO THRIE BEAM GUARDRAIL TRANSITION, WGT (WITH MARKUPS)




APPROVED MINUTES

CONCEPTUAL PROPOSAL ITEM 01 (continued)

REVISION TO STANDARD DRAWING 601-TWGT-01 W-BEAM GUARDRAIL TO THRIE BEAM GUARDRAIL TRANSITION, WGT (DRAFT)



SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current "thin polymeric deck overlay" spec consists of various unique special provisions. As we move forward with the Bridge and Culvert Preservation Initiative, more and more of this treatment will be done. INDOT needs a standard specification for this treatment.

PROPOSED SOLUTION: Make the unique a recurring special provision.

APPLICABLE STANDARD SPECIFICATIONS: N/A

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 72.3 - Bridge Deck Overlays

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

Submitted By: Elizabeth Phillips

Title: Bridge Standards Engineer

Organization: INDOT

Phone Number: 317-232-6775

Date: May 22, 2013

APPLICABLE SUB-COMMITTEE ENDORSEMENT?
Ad hoc - Tommy Nantung, Todd Shields, Scott Trammell, Jim Reilman, Drew Storey, Elizabeth Phillips, George Snyder, Tony Zander

APPROVED MINUTES

738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

*(Adopted XX-XX-14)*

**Description**

The polymeric concrete bridge deck overlay shall consist of an epoxy polymer that acts together with special aggregate to form an overlay system that adheres to the substrate deck concrete to prevent water and chloride intrusion. This work shall consist of preparing the surface to be treated and furnishing and placing the polymeric concrete bridge deck overlay in accordance with 105.03.

**Materials**

All material certifications shall be in accordance with 916 for the type specified and shall be submitted to the Engineer at least 14 calendar days prior to applying the materials. A Type C certification shall be submitted for the epoxy polymer and shall include the product trade name and manufacture. A Type A certification shall be submitted for the aggregate. The material requirements are as follows:

**(a) Epoxy Polymer**

The epoxy polymer used in the overlay shall be a two component system consisting of a resin base and a hardener. The epoxy polymer shall be one of the following products:

1. Pro-Poxy Type III D.O.T., manufactured by Unitex, Dayton Superior

2. E-Bond 526, manufactured by E-Bond Epoxies, Inc. with Indiana marketing rights owned by Transpo Industries, Inc.

3. Mark-163 Flexogrid, manufactured by Poly-Carb, Inc.

The Contractor shall provide technical literature with instructions on storing, mixing, applying the epoxy polymer, clean up, and disposing of excess materials. The epoxy polymer shall be stored according to the manufacturer's recommendations.

**(b) Aggregate**

The aggregate shall be in accordance with 917.01, ~~904.02 table with relation to SMA soundness requirements and 904.02(c),~~*and the SMA requirements of 904.02,* with the exception that limestone or crushed gravel be from an approved polish-resistant aggregate, PRA, source, and ACBF will not be allowed. Alternate aggregate recommended by the manufacturer of the polymeric concrete bridge deck overlays may come from a non-CAPP source provided the material requirements are met and approved by the Engineer. The aggregate shall be dry to a maximum moisture content of 0.2% by weight in accordance with AASHTO T 255. All aggregate shall be delivered to the project site in sealed containers.

Aggregate gradation shall be:

APPROVED MINUTES

| Sieve Size | Passing by Weight |
|---|---|
| #4 (4.75 mm) | 100% |
| #8 (2.36 mm) | 30 to 75% |
| #16 (1.18 mm) | 5% max. |
| #30 (0.6 mm) | 1% max. |

**(c) Patching Materials**

Material for partial depth bridge deck patching shall be one of the following. The material selected shall have written approval by the manufacturer of the epoxy used for the polymeric overlay and such approval shall be prior to the patching:

1. Rapid Setting Patch material in accordance with 901.07; except that materials containing magnesium phosphate shall not be used.

2. Epoxy mortar using the same materials as the polymeric overlay and proportioned according to the instructions provided by the manufacture of the epoxy.

Material for full depth bridge deck patching shall be one of the following:

1. Rapid setting patch material meeting the same requirements as stated previously for partial depth patches.

2. Bridge deck patching concrete in accordance with 722.04.

**Construction Requirements**

**(a) Weather Limitations**

Polymeric concrete overlays will not be allowed to be applied between October 15 and April 1. Materials shall not be placed when ambient air temperatures are below 55°F or above 90°F or when deck temperature is below 60°F or above 100°F. Materials shall not be placed on a wet surface, or when other weather conditions would adversely affect the performance of the polymeric bridge deck overlay system. The level of capillary moisture in the concrete will be measured as stated in sub-section(e).

**(b) Equipment**

Equipment, at a minimum, shall consist of a polymer distribution system, aggregate spreader, application squeegee and oil-free compressed air, and a source of lighting if work will be performed at night. The distribution system, or distributor, shall blend the polymer materials at the manufacturer's required proportioning and apply the materials to the work area at the proper rate to cover the entire bridge deck. The aggregate shall be applied in a uniform manner.

The equipment used to perform the Surface Preparation Test and Final Coat Test shall be in accordance with ITM 407. The test equipment will be approved by the Engineer prior to use. Test equipment shall

APPROVED MINUTES

include all miscellaneous equipment and materials to perform the tests and clean the equipment.

**(c) Inspection and Repair of Existing Deck**

Prior to the installation of the polymeric concrete bridge deck overlay on any deck section, the Engineer will sound the entire surface. The sounding is to identify any areas of deck that are in need of repair before applying the system. These areas include any delamination in the concrete deck, spalling, and breakouts. These areas shall be properly marked and repaired using the appropriate material specified for partial or full depth patching. Full depth bridge deck repairs using concrete meeting the requirements of 722.04 shall be placed a minimum of 28 days before the polymeric treatment installation can begin. The repair shall be in accordance with 722.06.

**(d) Preparation of Concrete Surfaces**

Full depth patching and partial depth patching of the bridge floor shall be in accordance with 722.06 using the materials defined in this specification. Before placement of the polymeric concrete surface treatment, the entire concrete bridge deck shall be thoroughly cleaned by steel shot blasting to ensure proper bonding between the treatment system and concrete substrate. A final shot blast texture meeting the International Concrete Repair Institute Levels 5 through 7 shall be achieved.

The surface shall be free of asphalt material, oil, dirt, rubber, curing compounds, paint carbonation, laitance, weak surface mortar and other potentially detrimental materials, which may interfere with the bonding or curing of the treatment system. Loosely bonded patches shall be removed and repaired. Traffic marking materials within the application area shall be removed. Compressed air shall be used to remove all dust and other loose material. Mechanical brooms, without water or vacuuming, may be used in certain applications to remove any residual dust that adheres to the prepared surface after it has been blown off with compressed air. The surface must then be blown again with compressed air after brooming to remove all loose residual dust. Compressed air used for shot blasting and other surface preparation shall be moisture and oil free in accordance with ASTM D 4285.

Pretreatment for cracks per the manufacturer’s recommendation shall be incorporated in the polymeric concrete bridge deck overlay installation. The pretreatment polymer material shall be in accordance with the manufacturer’s specifications.

To provide assurance that the cleaning procedure, materials, installation procedure, and curing period provide the desired treatment system, test patches shall be installed with the same materials, equipment, personnel, timing, sequence of operations, and curing period to be used for the installation of the overlay as required by section (e), entitled application.

After completion of the test patches, the Contractor shall perform the Surface Preparation Test. Each test patch shall 1 1/2 ft. by 3 ft. in area, and shall be installed to represent each bridge span

APPROVED MINUTES

or 600 sq yds, whichever is smaller. Test patches shall be placed in wheel paths, between wheel paths or in other areas that represent the worst surface conditions as determined by the Engineer. Three pull off tests shall be performed in each test patch. The center to center distance of adjacent pull-off tests within a patch shall be at least 6 inches. The distance from the center of a pull-off test and the edge of the patch shall be at least 4 in. If the concrete cover is less than 3/4 in., pull-off testing is not to be done directly over the uppermost bar of the mat of steel reinforcement.

The pull off test shall be performed in accordance with ITM 407. Each single pull off test shall have tensile bond strength greater than or equal to 250 psi in order for the results to be considered passing. In the case of a lower tensile bond strength, the mode of failure shall be visually examined.

If it is determined that the mode of failure involves a fracture depth at least 1/4 in. into the base concrete and the fractured concrete covers at least 50% of the pull-off test area, the test will be given a pass designation. All three tensile pull off tests must pass in order for the test area to be considered passing.

The cleaning method, materials, and installation procedure will be approved if all test patches pass the surface preparation tests.

If a test patch fails, the shot blasting method shall be adjusted for the area represented by the failing test patch. Surface preparation testing shall be repeated until satisfactory results are attained. Once an acceptable shot blasting procedure is established, it shall be continued for the balance of the work. The Contractor may, with written permission of the Engineer, change the shot blasting procedure or equipment, in which case additional surface preparation testing shall be required.

If the Engineer determines that an approved cleaning method has changed prior to the completion of the job, the Contractor shall return to the approved cleaning methods and re-clean the suspect areas or verify through tests that the altered method is acceptable.

All test patches for tensile pull off must be removed by a method approved by the Engineer. All damage to the deck surface caused by removal shall be repaired by an approved method with no additional payment.

**(e) Application**

Patching and cleaning operations shall be inspected and approved prior to placing each layer of the treatment system. Any contamination of the deck or intermediate courses, after initial cleaning, shall be removed. Both courses shall be applied within 24 hours following the final cleaning and prior to opening the area to traffic.

There shall be no visible moisture present on the surface of the original deck concrete or patch material at the time of application of the polymeric concrete bridge deck overlays. The presence of capillary

APPROVED MINUTES

moisture ~~in~~ will be determined in accordance with ASTM D 4263, except that no such test is required for partial depth repairs utilizing epoxy mortar. Compressed air in accordance with ASTM D 4285 may be used to dry the deck surface.

Handling and mixing of the epoxy polymer resin and hardening agent shall be performed in a manner to achieve the desired results in accordance with these specifications, and the manufacturer's recommendations as approved or directed by the Engineer. Polymeric concrete bridge deck overlay materials shall not be placed when weather or surface conditions are such that the material cannot be properly handled, placed, spread and cured within the specified requirements of traffic control.

The polymeric overlay system shall be applied in two separate courses in accordance with the following rate of application, and the total of the two applications shall not be less than 7.5 gal./100 sq ft.

| **Course** | **Rate, Gal./100 sq ft** | **Aggregate, lbs/sq yd*** |
|---|---|---|
| 1 | No less than 2.5 | No less than 10 |
| 2 | No less than 5.0 | No less than 14 |

* Application of aggregate shall be of sufficient quantity to completely cover the epoxy.

After the epoxy polymer mixture has been prepared for the polymeric concrete bridge deck overlay, it shall be immediately and uniformly applied to the surface of the bridge deck with a squeegee. The temperature of all epoxy polymer components shall be 70°F or above at the time of application. The treatment system materials shall not be applied if the air temperature is expected to drop below 55°F within 8 hours after application, or the gel time is less than 10 minutes.

The dry aggregate shall be applied in such a manner as to cover the polymer mixture completely within 5 minutes. Each course of polymeric overlay system shall be cured until vacuuming or brooming can be performed without tearing or damaging the surface.

Traffic or equipment shall not be allowed on the treatment system surface during the curing period. After the first course curing period, all loose aggregate shall be removed by vacuuming or brooming and the next treatment system course applied to completion.

The minimum curing periods shall be as follows:

| **Course** | **~~Average~~ *Minimum* temperature of deck *surface*, ~~polymer and aggregate components,~~ °F** | | | | | |
|---|---|---|---|---|---|---|
| | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | >85 |
| 1 | 4 hours | 3 hours | 2.5 hours | 2 hours | 1.5 hours | 1 hour |
| 2 | 6.5 hours* | 5 hours | 4 hours | 3 hours | 3 hours | 3 hours |

* Course 2 shall be cured for 8 hours if the air temperature drops below 60°F during the curing period.

APPROVED MINUTES

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

The Contractor shall plan and prosecute the work to provide the minimum curing periods as specified herein, or other longer minimum curing periods as prescribed by the manufacturer prior to opening to public or construction traffic, unless otherwise allowed. The first course applications shall not be opened to traffic.

Unless otherwise specified by the Engineer, the polymeric concrete bridge deck overlay shall not be applied over the expansion joints of a bridge deck. The expansion joints shall be coated with a bond breaker or covered using an approved tape that can adequately seal the joints from the polymer. Duct tape may also be used to delineate application areas. All taped areas or bond breakers shall be removed before the polymer fully cures.

In the event the operation damages or mars the epoxy treatment system, damaged areas shall be removed by saw cutting in rectangular sections to the top of the deck surface and replacing the course in accordance with this specification.

For all materials provided, the Contractor shall maintain and provide records including but not limited to, the following:

1. Batch numbers and sizes;
2. Location of batches as placed on deck, referenced by stations;
3. Batch time, gel time; temperature of the air, deck surface, polymer adhesive components, including aggregates;
4. Loose aggregate removal time; and time open to traffic.

Prior to construction of the polymeric concrete bridge deck overlay, the Contractor shall submit to the Engineer for approval a QCP for constructing the treatment system. The QCP shall include, but not be limited to, the materials, equipment, procedures and minimum and maximum air and deck surface temperatures; anticipated schedule for traffic control, patching, crack repair, surface preparation, and placement of the treatment system; and test reports, documentation, explanation, and justification to support the proposed QCP. The QCP shall also meet the approval of the manufacturer of the polymer materials. Any deviations from the application prescribed by this specification shall be explained to, and approved by, the Engineer before such deviation.

The Contractor shall plan and prosecute the work to provide the minimum curing periods as specified herein, or other longer minimum curing periods as prescribed by the manufacturer prior to opening to public or construction traffic.

**(f) Final Coat Testing**

Tensile Bond Pull-Off Tests in accordance with ITM 407 shall be performed after the final coat of the polymeric concrete surface treatment is cured and excess aggregate is removed to verify adequate bond strength of the epoxy to the cover aggregate and concrete substrate. Locations of the tensile pull-off test will be determined by

APPROVED MINUTES

the Engineer and shall be spaced at intervals of 75 lft for polymeric treatment widths of 24 ft. Final coat testing shall be performed prior to opening to traffic. Tensile pull-off testing shall not be performed when the surface temperature is at or above 90°F.

Damage resulting from the tensile bond pull-off testing shall be repaired using a small amount of the epoxy and aggregate used in the polymeric concrete bridge deck overlay.

All individual tensile bond pull-off tests which do not achieve a passing designation as previous defined for surface preparation shall have further testing performed according to the type of failure. Additional testing will determine the limits of further remedial action. If the pull off assembly does not achieve a load of 250 psi and detaches from the treated surface at the adhesive-aggregate interface, the test will not be valid. In such a case, the Contractor shall perform additional tests at 1 ft intervals until a valid test result, either pass or fail, is determined. In the case of a failing tensile pull off test, additional testing shall be performed to determine the limits of further remedial action under the following conditions.

1. Concrete failure. If the mode of failure for the tensile pull-off test involves a fracture depth at less than 1/4 in. into the base concrete or the fractured concrete covers less than 50% of the test area, the tensile pull off test will be given a failing designation. Additional tensile pull-off tests shall be conducted at 1 ft intervals in each direction from the failing result to determine the length and width of remedial action. The deficient area shall be repaired in accordance with the Construction Requirements (d) with the exception that a test patch is not required. Once the area is repaired and the polymeric concrete bridge deck overlay is applied, final coat testing will be performed on the repaired area.

2. Epoxy or Aggregate failure. Separation of the polymeric concrete surface treatment from the concrete surface or pull-off of the aggregate from the epoxy will be considered a failure. The Contractor shall perform at least two additional pull-off tests. One test shall be performed between 10 ft and 15 ft back from the failing test and one test shall be performed between 10 ft and 15 ft ahead of the failing test. The polymeric concrete surface treatment shall be removed and replaced at the Contractor's expense. The limits of polymeric surface treatment removal shall be defined 1/2 the distance back and 1/2 the distance ahead of the adjacent passing tests for the entire width of original placement.

**(g) Pavement Markings**

Heat bonded pavement markings shall not be allowed on the polymeric concrete bridge deck overlay.

APPROVED MINUTES

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

**Method of Measurement**

The accepted quantities of the polymeric concrete bridge deck overlay will be measured by the square yard. Full depth patching and partial depth patching will be measured in accordance with 722.14. The bridge deck patching concrete used in full depth or partial depth patching will not be measured.

**Basis of Payment**

Full depth patching and partial depth patching will be paid for in accordance with 722.15. Polymeric concrete bridge deck overlay will be paid for at the contract unit price per square yard.

Payment will be made under:

| **Pay Item** | **Pay Unit Symbol** |
|---|---|
| Polymeric Concrete Bridge Deck Overlay..... | SYS |

The cost of hand-chipping, removal of unsound concrete, preparation of cavity surfaces, furnishing and applying bond coat or epoxy resin adhesive as required, furnishing and placing patching material, and necessary incidentals shall be included in the cost of bridge deck patching, full depth, or bridge deck patching, partial depth.

The cost of all re-cleaning suspect areas or verification through tests that the altered cleaning method is acceptable shall be included in the cost of the polymeric concrete bridge deck overlay pay item.

All costs of cleaning the bridge deck by shot blasting or other approved methods, the tensile bond pull-off tests, removal of any crack sealants, removal of excess aggregate, test patch removal, removal and disposal of all waste materials, and furnishing all equipment, labor, materials, and incidentals to perform the work described herein shall be included in the cost of the polymeric concrete bridge deck overlay pay item.

APPROVED MINUTES

## 72-3.01 Bridge Deck

### 72-3.01(01) *Indiana Design Manual* Reference

Chapter 404 provides an in-depth discussion on the design of the deck for a new bridge. Many of the design and detailing principles provided in the Chapter also apply to deck rehabilitation. Therefore, the designer should review Chapter 404 to determine its potential application to a bridge rehabilitation project.

### 72-3.01(02) Typical Department Practices [Rev. May 2013, Feb 2014]

The Department has adopted the following typical practices for bridge-deck rehabilitation.

1. Bridge Deck Overlay.

   a. Patching. Patching the bridge deck should be considered a temporary measure to provide a reasonably-acceptable riding surface until a more-permanent solution can be applied.

   b. Latex-Modified Concrete (LMC) Overlay. This rigid overlay is typically applied in conjunction with deck patching. Since the early 1970s, the latex-modified overlay has been the most-common bridge-overlay technique used, and it has provided an average service life of 15 - 20 years.

   c. Polymeric Overlay. This flexible overlay consists of an epoxy polymer combined with a special aggregate. The wearing surface, deck, superstructure and substructure must each have a bridge inspection rating of 5 or higher in order to qualify as a candidate for a polymeric overlay. The Department has not yet compiled service life data. An average service life of 10 – 15 years is commonly used.

   d. Microsilica Concrete. A microsilica-concrete overlay may be used if providing a low diffusivity concrete overlay is desirable. This method has been used since the early 1990s.

APPROVED MINUTES

e. Asphalt Overlay with Sheet Membrane. This method was used in the 1960s and early 1970s with limited success. The difficult construction tolerances for surface preparation, membrane discontinuities, and application temperature have caused poor results.

A damaged waterproofing system is counterproductive in that it retains salt-laden water and continues supplying it to the deck which, thus, never dries out. Also, rain water or washing efforts cannot remove the salt. Due to its low reliability, INDOT no longer uses this rehabilitation technique.

f. Low-Slump Concrete. A dense low-slump concrete overlay, of 2¼-in. depth, has been specified as an alternative to a latex-modified overlay for over 25 years. This option has been seldom used. Because this product has the same characteristics as the latex-modified overlay and is more expensive, it is no longer specified.

g. Second Overlay. It is acceptable to remove an existing overlay and replace it with a new one. Department policy is to not allow a new overlay to be placed over an existing bridge deck overlay, because it is counterproductive and in the case of an LMC overlay adds to the dead weight of the structure. The placement of a polymeric overlay on an existing LMC overlay requires the approval of the Bridges Division Director.

2. Joints. The Department recognizes that the service life of bridge-deck expansion joints is much shorter than that of the bridge. Leaking and faulty joints represent a hazard for the deck and the main structural components. Therefore, the standard procedure is to eliminate all expansion joints as part of a bridge-rehabilitation project where practical. The elimination of joints may require substantial alterations and may have structural implications which should be investigated. Where applicable, the bridge-deck rehabilitation should be consistent with the criteria described in Chapter 404-2.0 relative to the design of bridge-deck expansion joints.

Compression seals (type BS joints) are not permitted on a bridge-deck rehabilitation project. Therefore, all such existing joints should be removed.

3. Minimum Patching Quantities. The quantity summaries for a bridge-rehabilitation project only include an estimate of the percent of bridge-deck patching. The exact amount of patching needed is determined in the field during construction. However, the minimum amount of bridge-deck patching shown in the quantities summary will be either 5% of the bridge deck area, or 300 $ft^2$, whichever is greater.

APPROVED MINUTES

COMMENTS AND ACTION (OLD BUSINESS ITEM)

PROPOSED NEW 738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

DISCUSSION: Ms. Phillips introduced and presented this item explaining the reasons behind making the current unique special provision a recurring special provision. The presented provision is as revised during the last meeting and as revised by the sub-committee with regard to the discussion and comments from the standards committee members. Ms. Phillips led the group through the revisions that were incorporated since the initial submission of this item.

Mr. Zander, sitting in for Mr. Walker, expressed some editorial revisions to be made, which were incorporated and are shown in these minutes.

Ms. Phillips revised her motion.

APPROVED MINUTES

| | |
|---|---|
| Motion: Ms. Phillips<br>Second: Mr. Cales<br>Ayes: 8<br>Nays: 0 | Action:<br>_____ Passed as Submitted<br>__X__ Passed as Revised<br>_____ Withdrawn |
| Standard Specifications Sections affected:<br>Proposed new<br><br>Recurring Special Provision possibly affected:<br><br>Proposed new<br><br>Standard Sheets affected:<br><br>NONE<br><br>Design Manual Sections affected:<br><br>CHAPTER 72.3<br><br>GIFE Sections cross-references:<br><br>NONE | _____ 2016 Standard Specifications Book<br>_____ Revise Pay Items List<br><br>__X__ Create RSP (No.738-B-297)<br>Effective May 01, 2014 Letting<br>RSP Sunset Date: TBD<br><br>_____ Revise RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>Standard Drawing Effective _____<br>_____ Create RPD (No. _____)<br>Effective _____ Letting<br>_____ Technical Advisory<br><br>GIFE Update Req'd.? Y ___ N __X__<br>By _____ Addition or _____ Revision<br><br>Frequency Manual Update Req'd? Y___N___<br>By _____ Addition or _____ Revision<br><br>Received FHWA Approval? YES |

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

1. ITM 507 and 510 requirements need to be followed for calcium/magnesium carbonate tests and sulfate content determination respectively for subgrades.

2. Instructions for determining subgrade treatments in 207.04 require further revision and several methods (Type IA, and Type IIIA) need to be deleted. The Contractor should be allowed to request from the Engineer a change in subgrade treatment (from Type IB to IC) due to the location(s) of shallow utilities.

PROPOSED SOLUTIONS:

1. Sulfate tests and calcium/magnesium test methods are added to 207.03

2. The types of subgrade treatments are revised

3. Allows the Contractor to request a change in the subgrade treatment if shallow utilities are encountered

APPLICABLE STANDARD SPECIFICATIONS: 207

APPLICABLE STANDARD DRAWINGS: Yes

APPLICABLE DESIGN MANUAL SECTION: Yes

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Nayyar Siddiki for Ron Walker

Title: Geotechnical Construction and Technical Support Engineer

Organization: INDOT

Phone Number: 317-610-7251 x 228

Date: January 17, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee with Soils Industry

APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 207 - SUBGRADE

The Standard Specifications are revised as follows:8i

SECTION 207, BEGIN LINE 1, INSERT AND DELETE AS FOLLOWS:

## SECTION 207 – SUBGRADE

**207.01 Description**

This work shall consist of the construction of the subgrade in accordance with 105.03.

## MATERIALS

**207.02 Materials**

Materials shall be in accordance with the following~~.~~:

Chemical Modifiers
- Fly Ash.....901.02
- Lime.....913.04(b)
- Portland Cement, Type I.....901.01(b)

Coarse Aggregate, Class D or Higher, Size No. 11, 12, 53, or 73 .....904
Geogrid, Type IB .....918.05(a)
Water.....913.01

Recycled concrete pavement meeting the requirements of coarse aggregate size No. 53 may be used when crushed stone size No. 53 is specified.

## CONSTRUCTION REQUIREMENTS

**207.03 General Requirements**

The subgrade shall be constructed uniformly transversely across the width of the pavement including shoulders or curbs unless shown otherwise on the plans, by one of the following methods:

(a) chemical modification in accordance with 215;

(b) aggregate No. 53 in accordance with 301;

(c) geogrid in accordance with 214 placed under aggregate No. 53 in accordance with 301, or

(d) soil compaction to 100% of maximum dry density.

Longitudinally, the treatment may vary depending on the method of construction.

APPROVED MINUTES

Soils containing greater than 3% by dry weight calcium~~,~~/magnesium carbonate or organic material, or with a maximum dry density of less than 100 lb/cu ft, or with liquid limit of greater than 50, *or with a soluble sulfate content greater than 1000 ppm,* will not be allowed within the specified thickness of the subgrade treatment in cut sections and will not be allowed within 24 in. of the finished subgrade elevation in fill sections. Density ~~shall~~*will* be determined in accordance with AASHTO T 99 *or AASHTO T 272* and loss of ignition ~~shall~~*will* be determined in accordance with AASHTO T 267. Liquid limits ~~shall~~*will* be determined in accordance with AASHTO T 89. *Calcium/magnesium carbonate will be determined in accordance with ITM 507. Sulfate content will be determined in accordance with ITM 510.*

Coal within the specified thickness of the subgrade shall be excavated if directed, and disposed of in accordance with 202.05. Coal or coal blossoms that are allowed to remain shall be mixed thoroughly with subgrade soils and compacted in accordance with 207.04.

All rock greater than 6 in. shall be removed or broken off at least 6 in. below the *specified* subgrade surface. Holes or depressions resulting from the removal of unsuitable material shall be filled with an acceptable material and compacted to conform with the surrounding subgrade.

During subgrade preparation, adequate drainage shall be provided at all times to prevent water from standing on the subgrade.

Even though the subgrade has been previously accepted, the condition of the subgrade *shall be in accordance with 105.03 and 207.04* at the time paving material is placed ~~shall be in accordance with 105.03 and 207.04.~~ Just prior to placing the base course on the subgrade, proofrolling in accordance with 203.26 shall be completed. Undue distortion of the subgrade shall be avoided. If limits of the work make mechanical preparation of the subgrade impractical, appropriate hand methods may be used.

The grade and cross section of the subgrade shall be finished within a tolerance of 1/2 in. from the true subgrade. Finishing within this tolerance by blading or other mechanical means without the use of side forms will be allowed. If these methods do not finish within this tolerance, side forms shall be used.

**207.04 Subgrade Treatments**

The subgrade treatment type shall be as specified on the contract plans. *If required, the subgrade foundation shall be* ~~*improved*~~*corrected as directed by the Engineer prior to the subgrade treatment.*

~~Within each of the following subgrade treatment types, the Contractor shall choose from the listed options for each type.~~

APPROVED MINUTES

Type I ~~14 in. chemical soil modification, 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53, or by~~ 24 in. of soil compacted to density and moisture requirements.

~~Type IA 14 in. chemical soil modification or 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53.~~

Type IB 14 in. chemical soil modification.

Type IC 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53.

Type II ~~8 in. chemical soil modification,~~ 6 in. of the subgrade excavated and replaced with coarse aggregate No. 53~~, or 12 in. of soil compacted to density and moisture requirements~~.

Type IIA 8 in. chemical soil modification ~~or 6 in. of the subgrade excavated and replaced with coarse aggregate No. 53~~.

Type III. 6 in. of soil compacted to the density and moisture requirements~~, or 6 in. of subgrade excavated and replaced with coarse aggregate No. 53~~.

~~Type IIIA 6 in. of subgrade excavated and replaced with coarse aggregate No. 53.~~

Type IV 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53 on Type IB geogrid.

Type V 3 in. of subgrade excavated and replaced with 3 in. coarse aggregate No. 53.

*In areas where shallow utilities are encountered or chemical modification ~~may~~ is not ~~be done~~allowed, the Contractor may submit a request to the Engineer to substitute Type IC for Type IB.*

Where the density and moisture control option is used, compaction of embankment areas shall be in accordance with 203.23. In cut and transition areas, the top lifts shall be removed, and the bottom 6 in. compacted in-place to comply with the specified density and moisture requirements. The excavated material shall then be replaced and compacted in 6 in. lifts to comply with the specified density and moisture requirements. Removal of the ~~upper~~ lifts may be waived and only the upper 6 in. treated in accordance with 207.03 when it is determined, through testing in accordance with 203.24, that the lower lifts comply with the specified density and moisture requirements.

APPROVED MINUTES

In sections where shale or shale and rock mixtures are encountered, these materials shall be undercut 12 in. below the subgrade elevation and replaced with coarse aggregate No. 53 or No. 73 and compacted in accordance with 301.06. All irregularities and holes shall be graded to provide positive drainage. Where necessary, finishing to subgrade elevation shall be accomplished using No. 11 or No. 12 crushed stone.

The existing railroad ballast and railroad bed material shall be excavated to the depth specified for subgrade treatment, ~~t~~*T*ype V and graded as shown on the plans, or as directed by the Engineer, in order to provide the subgrade width required for the proposed pavement section, including side slopes. Excavation and grading of the ballast and bed material shall include any cuts and fills necessary to account for erosion or degradation of the ballast in localized areas. Cuts and fills shall be balanced within sections approximately 300 ft in length along the profile of the pavement. The graded ballast and bed material shall be compacted in accordance with the applicable provisions of 203 prior to placement of the coarse aggregate No. 53. The 3 in. compacted aggregate as part of the subgrade treatment ~~t~~*T*ype V shall be compacted to 100% prior to the placement of the pavement.

When conditions are encountered below the specified subgrade treatment depth that prevent*s* achieving the specified subgrade compaction, such conditions shall be ~~treated~~*corrected* as directed.

**207.05 Method of Measurement**

Subgrade treatment will be measured in both cut and fill areas by the square yard per type. Chemicals for modification, excavation, aggregates, and geogrid materials will not be measured.

The undercutting of rock, where encountered, will be measured in accordance with 203.27(b).

**207.06 Basis of Payment**

The accepted quantities of subgrade treatment will be paid for at the contract unit price per square yard per type, complete in place. *In areas where shallow utilities are encountered or the Contractor elects to use Type IC for Type IB, payment will be made at the price of Type IB.* ~~*Payment for treating high sulfate content will be based on the method of treatment or paid as Extra Work in accordance with 104.03.*~~

The undercutting of rock, where encountered, will be measured in accordance with 203.27.

Payment will be made under:

| **Pay Item** | **Pay Unit Symbol** |
|---|---|



APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 207 - SUBGRADE

Subgrade Treatment, Type _____ ..... SYS

The cost of subgrade treatments including testing, sampling, aggregates for cut or at-grade areas, chemicals for modification, geogrid, water, and the excavation required for the methods chosen by the Contractor shall be included in the cost of the pay item for subgrade treatment, type.

The cost of excavation and grading of existing railroad ballast and railroad bed material shall be included in the cost of subgrade treatment, ~~t~~*T*ype V.

~~Compacted aggregate used for subgrade treatment in fill areas will also be measured and paid for as either embankment or as borrow, as appropriate, in accordance with 203.27 and 203.28.~~

Where conditions exist below the specified subgrade compaction depth that prevent achieving the specified compaction, payment for correcting such conditions will be made based on the directed method of treatment.

APPROVED MINUTES

COMMENTS AND ACTION

SECTION 207 - SUBGRADE

DISCUSSION: This item was introduced by Mr. Zander, sitting in as proxy for Mr. Walker, and was presented by Mr. Siddiki, who explained the proposed revisions to 207 as detailed on the proposal sheet and as shown above.

Further explanations were presented by Mr. Siddiki and Mr. Khan, with additional input from Mr. Hile from Specialties Company, LLC.

The paragraph concerning payment for compacted aggregate was struck out after a lengthy discussion by several members of the committee, and Mr. Hile concurred.

Ms. Phillips offered further revision to 207.04, which was approved by the committee and is shown above.

This item will be revisited prior to inclusion in the 2016 Standard Specifications.

Design Memo will be issued by Ms. Phillips, with assistance from Mr. Siddiki.

| | |
|---|---|
| Motion: Mr. Zander<br>Second: Mr. Keefer<br>Ayes: 8<br>Nays: 0 | Action:<br>_____ Passed as Submitted<br>__X__ Passed as Revised<br>_____ Withdrawn |
| Standard Specifications Sections affected:<br><br>SECTION 203 pg 144; 207 pg 194 thru 197.<br><br>Recurring Special Provision possibly affected:<br><br>NONE<br><br>Standard Sheets affected:<br><br>NONE<br><br>Design Manual Sections affected:<br><br>NONE<br><br>GIFE Sections cross-references:<br><br>NONE | __X__ 2016 Standard Specifications Book<br>_____ Revise Pay Items List<br><br>__X__ Create RSP (No.207-R-616)<br>Effective Sept. 01, 2014 Letting<br>RSP Sunset Date: Sep. 01, 2015<br><br>_____ Revise RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>Standard Drawing Effective _____<br>_____ Create RPD (No. _____)<br>Effective _____ Letting<br>_____ Technical Advisory<br><br>GIFE Update Req'd.? Y _ N _X<br>By _____ Addition or _____ Revision<br><br>Frequency Manual Update Req'd? Y___N___<br>By _____ Addition or _____ Revision<br><br>Received FHWA Approval? YES |

APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 215 – CHEMICAL MODIFICATION OF SOILS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

215.02: Calcium carbonate/magnesium determination testing (ITM 507) needs to be added. Sulfate test is changed from AASHTO to ITM 510
215.03: Lime by-products mix designs shall not be submitted to the Geotechnical Services
215.05: Exposed chemically modified subgrade may be damaged due to weather
215.07: Mixing problems during the slurry spreading over the grade
215.09: Compaction, mixing and moisture content methods need further clarification
215.10: Moisture content requires clarification when mixing with quicklime or hydrated lime
215.11: Additional mix design measurements need to be added
215.12: Additional mix design needs to be paid by change order method

PROPOSED SOLUTIONS:

Make appropriate revisions to Section 215

APPLICABLE STANDARD SPECIFICATIONS: 215

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Nayyar Siddiki for Ron Walker

Title: Geotechnical Construction and Technical Support Engineer

Organization: INDOT

Phone Number: 317-610-7251 x 228

Date: January 17, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc Committee with Soils Industry

APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 215 - CHEMICAL MODIFICATION OF SOILS

The Standard Specifications are revised as follows:

SECTION 215, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

## SECTION 215 – CHEMICAL MODIFICATION OF SOILS

### 215.01 Description

This work shall consist of the modification of soils by uniformly mixing portland cement, fly ash, lime, or a combination of the materials with soil to aid in *strength gain and* achieving the workability of soils having ~~an~~ excessive moisture content.

## MATERIALS

### 215.02 Materials

Materials shall be in accordance with the following:

Fly Ash .....901.02
Lime .....913.04(b)
Portland Cement, Type I .....901.01(b)
Water .....913.01

*Quicklime or ~~P~~portland cement may be used dry or as a slurry.*

Soils containing greater than 6% by dry weight calcium~~,~~/magnesium carbonate, or organic material, or having a maximum dry density of less than 95 pcf, or with a soluble sulfate content greater than 1,000 ppm shall not be used in the subgrade. The density shall be determined in accordance with AASHTO T 99, the loss on ignition shall be determined in accordance with AASHTO T 267, *the calcium/magnesium carbonate shall be determined in accordance with ITM 507,* and the sulfate content shall be determined in accordance with ~~AASHTO T 290~~ *ITM 510.*

## CONSTRUCTION REQUIREMENTS

### 215.03 Testing and Mix Design

The Contractor shall be responsible for all tests required to determine the chemical modifier type and optimum chemical modifier content for modification of the soils. The modifier selection, laboratory testing, and mix design shall be performed by an approved geotechnical consultant in accordance with the Department's Design Procedures for Soil Modification or Stabilization.

The quantities for hydrated lime, quicklime, or p~~P~~ortland cement shall be based on 4.0 ~~± 0.5~~% ~~by dry unit weight~~ *of the maximum dry density* of the soils. The quantities for lime *by-products* shall be based on 5.0 ~~± 1.0~~% ~~by dry unit weight~~ *of the maximum dry density* of the soils. The quantities for fly ash class C shall be based on 12.0 ~~± 2.0~~% ~~by dry unit weight~~ *of the maximum dry density* of the soils. Class F fly ash shall not be used except in combination with lime or cement.

APPROVED MINUTES

If hydrated lime, quick lime, *lime by-products* or p~~P~~ortland cement are used, test results and the geotechnical consultant recommendations shall be submitted to the Engineer prior to use. If fly ash, ~~lime by-products,~~ or any combination of chemical modifiers are used, the test results and the geotechnical consultant recommendations shall be submitted to the Engineer and to the Office of Geotechnical Services for approval at least five business days prior to use. If the modifier as bid is not appropriate for the soils encountered, p~~P~~ortland cement shall be used. Portland cement, fly ash, ~~and~~ lime, *and lime by-products* shall be from the Department's list of approved sources.

The quantity of chemical modifier may be adjusted for different soil types. However, the source or type of chemical modifier shall not be changed during the progress of the work without approval. A change in source or type shall require a new mix design.

**215.04 Storage and Handling**

The chemical modifier shall be stored and handled in accordance with the manufacturer's recommendations.

**215.05 Weather Limitations**

The chemical soil modification shall be performed when the soil has a minimum temperature of 45°F, measured 4 in. below the surface, and with the air temperature rising. The chemical modifier shall not be mixed with frozen soils or with soil containing frost. ~~*The chemically modified soil shall be limited to the area that may be covered by the pavement*~~ *Chemical soil modification shall only be performed in areas which are going to be paved during the same construction season.*

**215.06 Preparation of Soils**

The soils shall be prepared in accordance with 207.03. All aggregates which are larger than approximately 3 in. encountered before or after mixing the soils and chemical modifiers shall be removed.

**215.07 Spreading of Chemical Modifiers**

Where type A-6 or A-7 soils are used or encountered, the surface shall be scarified ~~or disked~~ to the specified depth prior to distribution of the chemical modifier. If a combination of modifiers is used, ~~it~~ *the modifiers* shall be mixed mechanically prior to being incorporated. The chemical modifier shall be distributed uniformly by a cyclone, screw-type, or pressure manifold type distributor. *If a slurry is used, the surface shall be scarified prior to the distribution of the slurry.* The chemical modifier shall not be applied when wind conditions create problems in adjacent areas or create a hazard to traffic on any adjacent roadway. The spreading of the chemical modifier shall be limited to an amount which can be incorporated into the soil within the same work day. If weather causes stoppage of work or exposes the chemical modifier to washing or blowing, additional chemical modifier may be spread when the work resumes.

APPROVED MINUTES

**215.08 Mixing**

The chemical modifier, soil, and water when necessary, shall be thoroughly mixed by rotary speed mixers or a disc harrow. The mixing shall continue until a homogenous layer of the required thickness has been obtained. One hundred percent of the material, exclusive of rock particles, shall pass a 1 in. (25 mm) sieve and at least 60% shall pass a No. 4 (4.75 mm) sieve. The mixing depth shall be 14 in.

**215.09 Compaction**

~~The moisture content of the mixture shall be at the optimum moisture content or above the optimum moisture content as determined by the mix design in accordance with 215.03. Moisture content will be determined in accordance with ITM 506. Aeration or drying by further mixing, or the addition of water and further mixing, may be done to obtain the required moisture content.~~

Compaction of the mixture shall begin as soon as practicable~~*practical*~~ after mixing *and shall be in accordance with 203 or 207.03 as applicable*. Compaction after mixing shall be as follows:

(a) For p~~P~~ortland cement modified soils, mixing shall be completed within ~~30 min~~ *1 h* of p~~P~~ortland cement placement and *grading and final* compaction shall be completed within 3 h after mixing.

(b) Fly ash modified soils shall be compacted within 4 h.

(c) Lime modified soils shall be compacted within 24 h.

~~Compactive efforts shall be in accordance with 203 or 207.03 as applicable.~~

Acceptance ~~testing for compaction~~ of chemically modified soils will be ~~performed on the finished grade~~ *determined by measuring the compaction* with a Dynamic Cone Penetrometer, DCP, in accordance with ITM 509. ~~The chemically modified soil lift shall meet the following requirements for compaction:~~ *Testing of the chemically modified soils will begin 24 hours after compaction.*

*Three random test locations will be determined in accordance with ITM 802 for each 1,500 lft of chemically modified soil for each 2-lane pavement section. The average of the blow counts obtained at the three random locations will be the DCP blow count representing the 1,500 lft section. Blow counts of 15 and above will be used to determine the average for the top 6 in. of a 14 in. lift. Blow counts of 14 and above will be used to determine the average for the bottom 8 in. of a 14 in. lift. Blow counts of 18 and above will be used to determine the average for the 8 in. lift. Locations with test results less than the specified minimum blow counts will be retested and shall be reworked if the minimum blow count is not obtained.*

APPROVED MINUTES

*The chemically modified soil lift shall meet the following requirements for compaction:*

(a) ~~A minimum~~ *The average* DCP blow count *will not be less than* ~~of~~ 17 for the top 6 in. of a 14 in. lift.

(b) ~~A minimum~~ *The average* DCP blow count *will not be less than* ~~of~~ 16 for the bottom 8 in. of a 14 in. lift.

(c) ~~A minimum~~ *The average* DCP blow count *will not be less than* ~~of~~ 20 for an 8 in. lift.

~~(d) A minimum of one passing test for each 1,500 lft of chemically modified soil for each 2-lane pavement.~~

*Moisture tests for chemically modified soils mixture will be performed every 4 hours during chemical and soils mixing. One gradation test in accordance with 215.08 will be performed for each 2,500 lft of chemically modified soil for each 2-lane pavement section.*

*Construction traffic or equipment will not be allowed on the treated soils until the soil meets the DCP test requirements.*

~~Construction traffic or equipment shall not be on the treated soils within 72 h after compaction.~~

***215.10 Curing***

*The moisture content of the mixture shall be at the optimum moisture content or above the optimum moisture content as determined by the mix design in accordance with 215.03. Moisture content will be determined* ~~*during*~~ *in accordance with ITM 506. Moisture content shall be maintained above the optimum moisture content for the first 48 h after mixing with quicklime or hydrated lime.*

**215.~~10~~*11* Method of Measurement**

The accepted quantity of chemically modified soils will be measured by the square yard, complete in place. All ~~excavation~~*removal and replacement* required to modify the soils below the specified depth will be measured in accordance with 203.27(b).

**215.~~11~~*12* Basis of Payment**

The accepted quantity of chemically modified soils will be paid for by the square yard complete in place. ~~*The cost of two mix designs shall be included in the Pay Items. Additional mix designs will be paid in accordance with 104.03*~~. All ~~excavation~~*removal*

APPROVED MINUTES

*and replacement* required to modify the soils below the specified depth will be paid for in accordance with 203.28.

Adjustment of materials for chemical modification that exceeds the limits of 215.03 will be included in a change order for materials only and paid for as chemical modifier adjustments. If mix design test results show that the chemical modifier as bid by the Contractor is not appropriate and the strength of the modified soil cannot be achieved, a price adjustment will be made for the use of *a* p~~P~~ortland cement, The price adjustment will be calculated at a cost equal to the difference in the invoice cost of the chemical modifier found to be appropriate for use and the invoice or quoted delivered cost of the chemical modifier as bid by the Contractor. This adjustment will be included in a change order and will be paid for as chemical modifier adjustments. Payment for chemical modifier adjustments will be made for direct delivered material costs incurred by the Contractor and shall not include any other markups.

Payment will be made under:

| **Pay Item** | **Pay Unit Symbol** |
|---|---|
| Chemical Modification, Soils..... | SYS |

The cost of performing ~~*two mix designs*,~~ the laboratory tests, providing an approved geotechnical consultant, scarification of the subgrade, spreading and mixing of the chemical modifier and soil, compaction of the resultant mixture, shaping the subgrade, work required due to adjustments of modifier proportioning, additional modification required due to weather conditions, correction of deficient areas, water required for the modification process, modified subgrade trimming, and all operations needed to meet the requirements of this specification shall be included in the cost of the pay items of this section.

APPROVED MINUTES

COMMENTS AND ACTION

SECTION 215 - CHEMICAL MODIFICATION OF SOILS

DISCUSSION: This item was introduced by Mr. Zander and presented by Mr. Siddiki, who explained the proposed revisions to 215 as detailed on the proposal sheet and as shown above.

Mr. Keefer inquired about the struck out language in 215.01, and Mr. Siddiki agreed that it should remain.

Further edits were made to the added language in 215.05, following much discussion. Additional editorial revisions were made to 215.11 and 215.12. Editorial revisions to the proposed added language was made to 215.05, outside of the meeting, for clarification.

Much discussion ensued concerning payments for testing and additional testing. Mr. Pankow suggested leaving it the way it was. The committee agreed and the revisions were removed.

Mr. Zander revised his motion.

| | |
|---|---|
| Motion: Mr. Walker<br>Second: Mr. Keefer<br>Ayes: 8<br>Nays: 0 | Action:<br>_____ Passed as Submitted<br>__X__ Passed as Revised<br>_____ Withdrawn |
| Standard Specifications Sections affected:<br><br>SECTION 215 pg 214 thru pg 218.<br><br>Recurring Special Provision possibly affected:<br><br>NONE<br><br>Standard Sheets affected:<br><br>NONE<br><br>Design Manual Sections affected:<br><br>NONE<br><br>GIFE Sections cross-references:<br><br>NONE | __X__ 2016 Standard Specifications Book<br>_____ Revise Pay Items List<br><br>__X__ Create RSP (No.215-R-615)<br>Effective May 01, 2014 Letting<br>RSP Sunset Date: Sep. 01, 2015<br><br>_____ Revise RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>Standard Drawing Effective _____<br>_____ Create RPD (No. _____)<br>Effective _____ Letting<br>_____ Technical Advisory<br><br>GIFE Update Req'd.? Y _X_ N ___<br>By _____ Addition or _____ Revision<br><br>Frequency Manual Update Req'd? Y___N___<br>By _____ Addition or _____ Revision<br><br>Received FHWA Approval? YES |

APPROVED MINUTES

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: 913.04(b)2(c): Specifications permit the use of lime by-products which may have a high sulfate content that may cause heaving of the subgrade.

PROPOSED SOLUTIONS: Add a limit for soluble sulfate for lime by-products

APPLICABLE STANDARD SPECIFICATIONS: 913

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Nayyar Siddiki for Ron Walker

Title: Geotechnical Construction and Technical Support Engineer

Organization: INDOT

Phone Number: 317-610-7251 x 228

Date: January 17, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc Committee with Soils Industry

APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 913 – SOIL TREATMENT MATERIALS
913.04 LIME

The Standard Specifications are revised as follows:

SECTION 913, BEGIN LINE 31, DELETE AND INSERT AS FOLLOWS:

**913.04 Lime**

Lime shall be a hydrated lime when used in masonry or a hydrated lime, quicklime, or lime by-product when used for soil modification.

**(a) Hydrated Lime for Masonry**

Hydrated lime used in masonry shall be in accordance with ASTM C 207, Type N.

**(b) Lime for Soil Modification**

Hydrated lime, quicklime, or lime by-product used for soil modification shall be approved in accordance with ITM 806, Procedure P and shall meet the following requirements.

**1. Hydrated Lime and Quicklime**

Hydrated lime and quicklime shall be in accordance with AASHTO M 216.

**2. Lime By-Products**

Lime by-products shall be hydrated lime or quicklime by-products in accordance with ASTM C 25 having the following requirements.

a. The lime by-products shall contain a minimum of 60% total calcium and magnesium oxides (non-volatile basis).

b. Available calcium hydroxide plus magnesium oxide calculated as calcium hydroxide shall be a minimum of 30%.

*c. Soluble ~~sulphate~~ sulfate shall not be more than 5%.*

~~c~~*d.* Sieve analysis shall be performed in accordance with ASTM C 110. The lime by-products gradation shall be as follows:

| Sieve | % Retained (Max.) |
|---|---|
| No. 4 (4.75 mm) | 5 |
| No. 30 (600 µm) | 10 |
| No. 100 (150 µm) | 25. |

APPROVED MINUTES

COMMENTS AND ACTION

913.04 LIME

DISCUSSION: This item was introduced by Mr. Zander and presented by Mr. Siddiki and Mr. Khan, who explained the proposed revisions to 913 as detailed on the proposal sheet and as shown above.

| | |
|---|---|
| Motion: Mr. Walker<br>Second: Mr. Boruff<br>Ayes: 8<br>Nays: 0 | Action:<br>__X____ Passed as Submitted (w/editorial change)<br>_____ Passed as Revised<br>_____ Withdrawn |
| Standard Specifications Sections affected:<br><br>SECTION 913.04 pg 950.<br><br>Recurring Special Provision possibly affected:<br><br>NONE<br><br>Standard Sheets affected:<br><br>NONE<br><br>Design Manual Sections affected:<br><br>NONE<br><br>GIFE Sections cross-references:<br><br>NONE | __X__ 2016 Standard Specifications Book<br>_____ Revise Pay Items List<br><br>__X__ Create RSP (No.913-R-614)<br>Effective May 01, 2014 Letting<br>RSP Sunset Date: Sep. 01, 2015<br><br>_____ Revise RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>Standard Drawing Effective _____<br>_____ Create RPD (No. _____)<br>Effective _____ Letting<br>_____ Technical Advisory<br><br>GIFE Update Req'd.? Y ___ N _X<br>By _____ Addition or _____ Revision<br><br>Frequency Manual Update Req'd? Y___N___<br>By _____ Addition or _____ Revision<br><br>Received FHWA Approval? YES |

APPROVED MINUTES

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO RECURRING PLAN DETAILS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: A number of standard drawings for temporary traffic control show an outdated version of the symbolic lane ends warning sign. This is resulting in the incorrect version being used in some work zones.

PROPOSED SOLUTION: In the long term- revise the standard drawings. However since other revisions to the many of the same drawings are being considered, the short term solution is to adopt a recurring plan detail that shows the current version.

APPLICABLE STANDARD SPECIFICATIONS: N/A

APPLICABLE STANDARD DRAWINGS: 801-TCCO-01, 801-TCFO-03, 801-TCLC-01 thru 801-TCLC-06, 801-TCLC-09, 801-TCLC-10, 801-TCLC-11, 801-TCLC-13, 801-TCLC-15, 801-TCLC-16, TCSN-05, TCTC-06, TCTC-09, and TCTC-10.

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: N/A

Submitted By: David Boruff

Title: Manager, Office of Traffic Administration

Organization: INDOT

Phone Number: 317-234-7975

Date: 1-27-2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc with Work Zone Safety, Construction Management, and the Standards and Policy Office.

APPROVED MINUTES

REVISION TO RECURRING PLAN DETAILS

PROPOSED NEW RPD 801-T-XXX LANE ENDS WARNING SIGNS

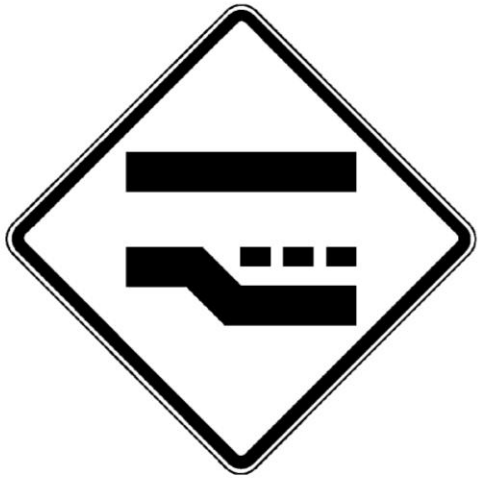
Eff. for Lettings On or After 0X-XX-14

NOTES:

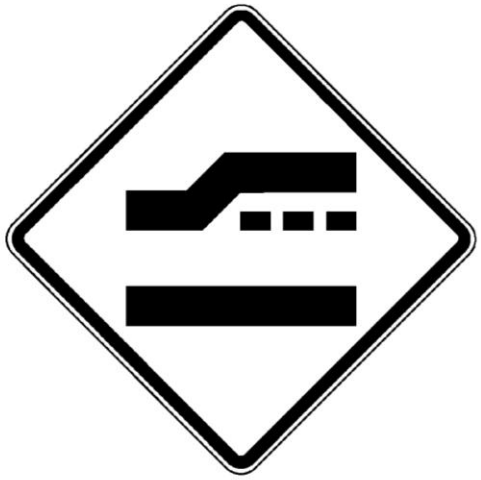
1. The XW4-2 series signs depicted in the following Standard Drawings shall be superseded by the versions shown on this sheet and are further detailed in the Standard Highway Signs and Markings Book, 2004 edition.

801-TCCO-01
801-TCFO-03
801-TCLC-01
801-TCLC-02
801-TCLC-03
801-TCLC-04
801-TCLC-05
801-TCLC-06
801-TCLC-09
801-TCLC-10
801-TCLC-11
801-TCLC-13
801-TCLC-15
801-TCLC-16
801-TCSN-05
801-TCTC-06
801-TCTC-09
801-TCTC-10

The color and support post details provided on Standard Drawing E 801-TCSN-12 shall apply.



XW4-2(L)
XW4-2-A(L)



XW4-2(R)
XW4-2-A(R)

INDIANA DEPARTMENT OF TRANSPORTATION

LANE ENDS WARNING SIGNS

E 801-T-XXXd 1 of 1

COMMENTS AND ACTION

RPD 801-T-XXX LANE ENDS WARNING SIGNS

DISCUSSION: Mr. Boruff presented this item and explained that Work Zone Safety had seen some signs without the dashed line. It was determined that the signs and drawings should be updated to reflect the current MUTCD.

APPROVED MINUTES

| | |
|---|---|
| Motion: Mr. Boruff<br>Second: Mr. Prather<br>Ayes: 8<br>Nays: 0 | Action:<br>__X__ Passed as Submitted<br>_____ Passed as Revised<br>_____ Withdrawn |
| Standard Specifications Sections affected:<br>NONE<br><br>Recurring Special Provision possibly affected:<br><br>NONE<br><br>Standard Sheets affected:<br><br>See proposal<br><br>Design Manual Sections affected:<br><br>NONE<br><br>GIFE Sections cross-references:<br><br>NONE | _____ 2016 Standard Specifications Book<br>_____ Revise Pay Items List<br><br>_____ Create RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>_____ Revise RSP (No._____)<br>Effective _____ Letting<br>RSP Sunset Date: _____<br><br>Standard Drawing Effective _____<br>__X__ Create RPD (No. 801-T-203d)<br>Effective May 01, 2014 Letting<br>_____ Technical Advisory<br><br>GIFE Update Req'd.? Y ___ N _X<br>By _____ Addition or _____ Revision<br><br>Frequency Manual Update Req'd? Y___N___<br>By _____ Addition or _____ Revision<br><br>Received FHWA Approval? YES |