INDIANA DEPARTMENT OF TRANSPORTATION
Driving Indiana's Economic Growth

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Michael R. Pence, Governor
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APPROVED MINUTES

December 19, 2013 Standards Committee Meeting

MEMORANDUM

February 25, 2014

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the December 19, 2013 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Miller at 09:01 a.m. on December 19, 2013 in the N955 Bay Window Conference Room. The meeting was adjourned at 12:30 p.m.

The following committee members were in attendance:

Mark Miller, Chairman, Construction Management Director
Mike Beuchel*, Contract Administration Division
Dave Boruff, Traffic Engineering Division
Elizabeth Phillips, Bridges Division
Greg Pankow, State Construction Engineer
Jim Keefer, Fort Wayne District Construction Director
Michael Prather**, Pavement Engineering
Michelle Gottschalk, Construction Technical Support
Richard Vancleave, Highway Design and Technical Support Division
Ron Walker, Materials Management

Proxy for Bob Cales
**Proxy for Mike Buening*

Also in attendance were the following:

Andrew Gauck, IMAA
Dan Osborn, ICA
David Holtz, INDOT
Drew Storey, INDOT
Ellis Holder, INDOT
Lana Podorvanova, INDOT
Nayyar Siddiki, INDOT
Rick Smith, RoadSafe
Steve Fisher, INDOT
Wendy Chiles, INDOT
Todd Shields, INDOT
Paul Berebitsky, ICA
Scott Trammell, INDOT
Tom Duncan, FHWA
Tony Zander, INDOT
Athar A. Khan, INDOT
Yuhui Hu, INDOT
Jim Reilman, INDOT
Joshua Kiilu, INDOT
Ryan Merchant, RAM Constr.

The following items were listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items were listed for consideration)

NEW BUSINESS

1. Approval of the Minutes from the November 22, 2013 meeting

DISCUSSION: Mr. Miller requested a motion to accept the Minutes from the November 22, 2013 meeting.

Motion: Mr. Boruff
Second: Mr. Keefer
Ayes: 9
Nays: 0

ACTION: PASSED AS SUBMITTED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed for consideration)

NEW BUSINESS

(No items were listed for consideration)

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

OLD BUSINESS

Item No. 04 11/22/13 (2014 SS) Mr. Keefer pg 04
801-C-XXX *TEMPORARY CONSTRUCTION SIGNS*

ACTION: PASSED AS SUBMITTED

NEW BUSINESS

Item No. 01 12/19/13 (2014 SS) Ms. Phillips pg 07
738-B-XXX *POLYMERIC CONCRETE BRIDGE DECK OVERLAY*

ACTION: WITHDRAWN

Item No. 02 12/19/13 (2014 SS) Mr. Pankow pg 18
731-B-XXX *MSE RETAINING WALL REQUIREMENTS*

ACTION: PASSED AS REVISED

Item No. 03 12/19/13 (2014 SS)	Mr. VanCleave	pg 27
610-MBAP-01	MAILBOX APPROACHES HIGH SPEED ROADWAY	
610-MBAP-02	MAILBOX APPROACHES LOW SPEED ROADWAY	

(NO ACTION, EDITORIAL CHANGES)

Item No. 04 12/19/13 (2014 SS)	Ms. Phillips	pg 33
609.02	Materials	
609.13	Method of Measurement	
609.14	Basis of Payment	
609-RCBA-01	REINFORCED CONCRETE BRIDGE APPROACH SQUARE	
609-RCBA-02	REINFORCED CONCRETE BRIDGE APPROACH SKEWED	
609-RCBA-03	REINFORCED CONCRETE BRIDGE APPROACH SECTION AND PAVEMENT LEDGE DETAILS	

ACTION: PASSED AS REVISED

cc: Committee Members
FHWA
ICA

Mr. Keefer
Date: 12/19/13

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS ITEM)

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The need has arisen for more clarity to the frequency of payment for particular temporary construction signs.

PROPOSED SOLUTION: Add Road Closure Sign Assemblies to the language stating which temporary construction signs will only be paid for once regardless of how many times they are moved or replaced during the contract, and reinstate previously removed language about "how many times each is altered to change the sign message" for temporary construction signs paid for once.

APPLICABLE STANDARD SPECIFICATIONS: 801.18

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: Road Closure Sign Assembly…….EACH

Submitted By: James W. Keefer

Title: Ft Wayne District Construction Engineer

Organization: INDOT

Phone Number: 260-969-8245

Date: December 13, 2013

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc: Jim Keefer, Tom Keefer

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS ITEM)

PROPOSED NEW RSP 801-C-XXX TEMPORARY CONSTRUCTION SIGNS

801-C-XXX TEMPORARY CONSTRUCTION SIGNS

(Adopted XX-XX-13)

The Standard Specifications are revised as follows:

SECTION 801, BEGIN LINE 1126, INSERT AS FOLLOWS:

Each construction sign, barricade, temporary worksite speed limit sign assembly, *road closure sign assembly*, ~~portable changeable message sign,~~ or flashing arrow sign will be paid for only once regardless of how many times each is moved, ~~or~~ replaced, *or how many times each is altered to change the sign message*. Payment will not be made for signs or barricades used for the convenience of the Contractor.

Additional materials necessary to place the ~~PCMS~~ *portable changeable message sign* in a secure and level manner for site conditions shall be included in the cost of the pay item. All costs to furnish, install, program, activate, deactivate, change messages, *move, replace,* and maintain the PCMS shall be included in the cost of the pay item. The cost of IP cellular phone service shall be included in the cost of the pay item.

COMMENTS AND ACTION (OLD BUSINESS ITEM)

NEW RSP 801-C-XXX TEMPORARY CONSTRUCTION SIGNS

DISCUSSION: This item was introduced and presented by Mr. Keefer who explained that the intention is to reinstate the language that had appeared in this section beginning in 1985 Standard Specifications. This item had been withdrawn from last month's meeting in order to give industry and the traffic committee time to fully review and respond to this revision.

Mr. Boruff mentioned some other language that had been considered but agreed that this proposed revision will work well, as Mr. Keefer stated that Mr. Boruff's previously proposed additional language would only complicate things at this time. At Mr. Boruff's inquiry, Mr. Berebitsky replied that it is difficult to anticipate any change to jobsite conditions. Mr. Rick Smith, of RoadSafe, suggested that the issue should be revisited since there is a substantial cost associated with each sign change or modification. Mr. Pankow offered that there should be better communication between prime contractors and subs. Mr. Smith stated that some signs need to be moved as traffic control criteria changes and that the proposed language leave the issue open ended.

Further discussion ensued and Mr. Keefer suggested to keep this item simple and address only what is presented here. Further issues can be addressed at a later date. Mr. Pankow stated that the inconsistency is due to how each District handles this issue. Mr. Boruff agreed that the traffic committee will address the other issues involved. With regard to this particular item, there was no further discussion.

Motion: Mr. Keefer Second: Mr. Boruff Ayes: 9 Nays: 0	Action: __X__ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: SECTION 801.18 pg 742. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications Book ____ Revise Pay Items List __X__ Create RSP (No. 801-C-237) Effective April 01, 2014 Letting RSP Sunset Date: TBD ____ Revise RSP (No.____) Effective ____ Letting RSP Sunset Date: _____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____ Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N _X_ By _____ Addition or _____ Revision Frequency Manual Update Req'd? Y__N__ By _____ Addition or _____ Revision Received FHWA Approval? YES

Ms. Phillips
Date: 12/19/13

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

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

REVISION TO SPECIAL PROVISIONS

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

738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

(Adopted XX-XX-XX)

Description

The polymeric concrete bridge deck overlays 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 aggregates for all layers shall be non-friable, and non-polishing.~~ The aggregate shall be in accordance with 917.01, 904.02 *table with relation to* SMA *soundness requirements* and 904.02 (c), 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~~se~~ *material* requirements are met and approved by the Engineer~~, with the exception that it may come from a non-CAP source~~. The aggregate shall be ~~clean and~~ dry to a maximum moisture content of 0.2% by weight in accordance with AASHTO T 255 ~~and free of dirt, clay, asphalt and other foreign or organic materials~~. *All aggregate shall be delivered to the project site in sealed containers*.

REVISION TO SPECIAL PROVISIONS

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

Aggregate gradation shall be:

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

Patching material used for partial or full depth bridge deck patching shall be bridge deck patching concrete in accordance with 722.

Construction Requirements

(a) Weather Limitations

Polymeric concrete overlays will not be ~~permitted~~ *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. ~~All components shall have a temperature no less than 70°F at the time of mixing and placement. Materials shall not be placed when rain is forecast within 24 hours of application of the overlay.~~

(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 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 overlays 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 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 except that only bridge deck patching concrete shall be used to fill the patches. Latex Modified concrete shall not be used. Before placement of the polymeric concrete surface treatment, the entire concrete bridge deck shall be thoroughly

REVISION TO SPECIAL PROVISIONS

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

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 overlays 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.

The concrete or any deck repairs shall not be less than 28 days old at the time of surface preparation and installation of the test patches. After completion of the test patches, the Contractor shall perform the Surface Preparation Test. Each test patch shall 1.5 ft. by 3 ft. in area, and shall be installed to represent each bridge span or 300 square yards, 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 four inches. If the concrete cover is less than 3/4 inch, pull-off testing is not to be done directly over the uppermost bar of the mat of steel reinforcement.

Tensile pull-off testing shall not be performed when the surface temperature is at or above 90°F. 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 inch 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 concrete at the time of application of the polymeric concrete bridge deck overlays. A plastic sheet left taped in place for a minimum of 2 hours, according to ASTM D 4263, shall be used to identify moisture in the deck. 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*

REVISION TO SPECIAL PROVISIONS

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

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 overlays, it shall be immediately and uniformly applied to the surface of the bridge deck with a squeegee. The temperature of ~~the bridge deck surface and~~ all *epoxy* polymer ~~adhesive and aggregate~~ components shall be ~~60~~*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 concrete treatment system shall be cured until vacuuming or brooming can be performed without tearing or damaging the surface.

Traffic or equipment shall not be ~~permitted~~*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 temperature of deck, 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.

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 ~~permitted~~*allowed*. The first course applications shall not be opened to traffic.

Unless otherwise specified by the Engineer, the polymeric concrete bridge deck overlays 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 overlays, 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 the Engineer and shall be spaced at intervals of 75 linear feet 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 overlays.

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 inch 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 one foot 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 overlays 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 ~~permitted~~*allowed* on the polymeric concrete bridge deck overlays.

Method of Measurement

The accepted quantities of the polymeric concrete bridge deck overlays 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 overlays 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

REVISION TO SPECIAL PROVISIONS

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

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 ~~surface treatment~~*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, ~~any profile grinding~~*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 ~~surface treatment~~bridge deck overlay pay item.

COMMENTS AND ACTION

738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

DISCUSSION: This item was introduced and presented by Ms. Phillips as described in the proposal sheet. Mr. Shields explained that the Department has accomplished a lot of bridge deck overlays involving various Unique Special Provisions and this proposal is designed to establish one special provision for this type of work.

Mr. Keefer mentioned that there seems to be a temperature requirement conflict. Mr. Zander agreed that there is a conflict and the temperature was revised on to read 70°F. Further minor edits were discussed and implemented. Mr. Ryan Merchant (RAM Construction) stated that the temperature of the deck will have more of an effect on the materials than the materials will have on the deck, and suggested revising the language concerning the temperature of the aggregate. The committee agreed and the language was revised, as shown.

Ms. Phillips suggested further revisions to the aggregate language. Mr. Walker agreed. Further discussion ensued between Mr. Merchant and Mr. Walker concerning the aggregates with relation to the MOHs hardness and skid resistance. Mr. Walker further explained the details of the aggregates listed in this provision and recommended that the aggregates section (b) be revised. As for skid resistance, Mr. Walker stated that steel slag rates higher than the other aggregates considered.

Mr. Holtz asked about the cost of the aggregates and Mr. Merchant determined that the cost of the aggregates is insignificant in relation to the cost of the epoxy polymer materials. Mr. Miller asked if the overlay committee had considered a warranty instead of specifying material requirements. Mr. Shields stated that yes, they did, and the Contractor is free to use whatever materials they are comfortable using, and that adding a warranty will increase the overall cost. This was confirmed by Mr. Merchant. Mr. Prather mentioned that the skid numbers he has seen with this product have been very high. Mr. Storey stated that the intent of this process is not to increase skid numbers, but rather it is more of a preservation treatment.

Following much discussion concerning the quality of the aggregates, Mr. Miller suggested adding language stating that the aggregate will be kept in a sealed container, free from moisture.

Ms. Phillips recommended revising the patching section language to eliminate the 28 day requirement. Ms. Phillips and Mr. Zander will work on this so that rapid-set materials can be used. Mr. Miller suggested changing the reference to allow for only rapid-set and not allow for conventional patching which has a 28 day cure time. Also discussed was the sounding of the deck to locate patch areas.

Ms. Phillips addressed further comments and concerns from industry with regard to the 90°F limit. Mr. Zander asked if the language could be stricken from the provision and placed in the ITM. Ms. Phillips agreed that they will look into doing that. Another concern involves pre-testing. Mr. Merchant stated that they prefer post-testing since pre-testing is a rather lengthy process. Mr. Shields stated that the concern is that the product will be effective and that we are getting a good product. Mr. Storey affirmed that stance. Mr. Merchant asked if the requirement for testing could be changed to every span or every 600 yds, which is standard. Mr. Storey explained that this spec is designed to keep this from being proprietary.

This item is withdrawn pending further revisions.

COMMENTS AND ACTION

738-B-XXX POLYMERIC CONCRETE BRIDGE DECK OVERLAY

(CONTINUED)

Motion: Ms. Phillips Second: Mr. Pankow Ayes: Nays:	Action: _____ Passed as Submitted _____ Passed as Revised __X__ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: SECTION 72.3 GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications Book ____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ ____ Revise RSP (No.____) Effective ____ Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____ Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? _____

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Due to a need for additional instruction, changes are necessary to portions of the 731 mechanically stabilized earth (MSE) retaining wall specification section & 735 temporary wire-faced MSE retaining wall specification section.

PROPOSED SOLUTION: Reinstate the limit on ACBF used as structure backfill type 3 to only be size No. 8. Indicate what value shall be used for F* when designing MSE wall systems. Require dynamic cone penetrometer testing to verify compaction of the MSE foundations, and more clearly state what the Department expects for design calculations.

APPLICABLE STANDARD SPECIFICATIONS: 731, & 735

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: 410-5.0

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: create new RSP

PAY ITEMS AFFECTED: none

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT

Phone Number: 232-5502

Date: November 25, 2013

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc committee consisting of: David Holtz, Yuhui Hu, Mark Miller, Greg Pankow, Jim Reilman, and Nayyarzia Siddiki.

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

731-B-XXX MSE RETAINING WALL REQUIREMENTS

(Adopted XX-XX-XX)

The Standard Specifications are revised as follows:

SECTION 211, BEGIN LINE 111, DELETE AND INSERT AS FOLLOWS:

(c) Type 3

Structure backfill in accordance with 904.05, except only nominal size aggregates 1 in., 1/2 in., No. 4 or No. 30, and coarse aggregate No. 5, No. 8, No. 9, No. 11, or No. 12 shall be stone ~~or ACBF~~. *ACBF meeting the size requirements for coarse aggregate No. 5 or No. 8 may also be used.*

SECTION 731, BEGIN LINE 60, INSERT AS FOLLOWS:

731.03 Design Criteria

The internal stability shall be the responsibility of the Contractor. The design by the Engineer will consider the external stability of the wall mass including the applied bearing pressure, overturning, sliding, and stability of temporary construction slopes. The design for internal stability shall be in accordance with the AASHTO LRFD Bridge Design Specifications and the requirements specified herein. *The design submittal shall include connection strength design. Each design case shall present maximum tension capacity, soil overburden pressure, and horizontal pressure at each reinforcement level, pullout capacity at each reinforcement level, the length of embedment in the resisting zone, L_e, and the total length of reinforcement at each level.*

The value of the pullout resistance factor, F, used in design calculations shall be obtained from the AASHTO LRFD Bridge Design Specifications figure 11.10.6.3.2-1.*

SECTION 731, BEGIN LINE 80, DELETE AND INSERT AS FOLLOWS:

The material used as backfill in the reinforced backfill zone shall be assumed to have a unit weight of at least 120 lb/cu ft unless lightweight fill has been specified. The ~~φ,~~ angle for the internal design of the reinforced backfill shall be ~~assumed~~ 34°. The φ angle of the backfill behind the reinforced portion of the MSE volume shall be ~~assumed~~ 30° *for design*. The φ angle ~~for the internal design~~ of the foundation soils shall be ~~assumed~~ *obtained from the geotechnical report and shall not exceed* 30° *for design*. For the external design parameters, such as but not limited to, bearing capacity, sliding, overturning, eccentricity, and global stability, the actual soil strength parameters used shall be obtained from the geotechnical report.

The coefficient of uniformity, c_u, of the reinforced backfill for all designs using the ribbed steel strips curve from AASHTO LRFD Bridge Design Specifications figure 11.10.6.3.2-1 shall be 4.0.

SECTION 731, AFTER LINE 134, DELETE AND INSERT AS FOLLOWS:

(d) Other Criteria

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

1. Traffic Load Considerations

Traffic load shall be considered as live load surcharge. The load factor of traffic load shall be 1.75 in accordance with AASHTO LRFD Bridge Design Specifications table 3.4.1-1.

2. Traffic Impact Considerations

Where traffic barriers are constructed above an MSE wall or reinforced backfill envelope, the MSE wall supporting traffic shall include computations showing that the Extreme Event II limit state due to traffic impact has been met.

Loadings for MSE wall design for the Extreme Event II limit state shall be in accordance with the following table:

Maximum Nominal Tension Rupture and Pullout Impact Loads		
Layer	*Tension Impact Load*	*Pullout Impact Load*
First Top Layer	*2,300 lbs/ft*	*1,300 lbs/ft*
Second Top Layer	*600 lbs/ft*	*600 lbs/ft*

The Extreme Event II design for the top two layers shall be separately prepared and compared with the routine internal stability design.

3. Tributary Area – Design Basis

For internal stability analysis of MSE walls, each layer of reinforcement is assigned a tributary area, A_{trib} in accordance with FHWA publication no. FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume II and as follows:

$$A_{trib} = (w_p)(S_{vt})$$

where:

w_p = the wall system concrete panel width of the precast facing element, and

S_{vt} = the vertical tributary spacing of the reinforcement based on the location of the reinforcement above and below the level of the reinforcement under consideration.

For a wall system with steel reinforcement, within each tributary area, the factored reinforcement tensile resistance, T_r, and the factored pullout resistance, P_{rr}, shall be no less than the maximum factored tension load, T_{max}. If the calculated minimum number of strips is ~~an uneven~~a decimal number, the minimum number required shall be rounded up to the next ~~even~~ whole number.

731.04 Submittals

The Contractor shall submit working drawings ~~and design calculations~~ in accordance with 105.02. *The Contractor shall submit design calculations in accordance*

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

with 105.02 and the following additional requirements. In case of discrepancy, the requirements listed below supersede those listed in 105.02. Design calculations shall show the complete design of the MSE wall. Calculations may be in either longhand or computer-printout format and must follow a systematic and logical methodology. A summary sheet that shows design assumptions and their source, controlling parameters and load cases, and other pertinent input and output information shall be attached to the calculations package. Wall construction operations shall not begin until the Contractor receives written notice that the working drawings are approved.

SECTION 731, BEGIN LINE 208, INSERT AS FOLLOWS:

Fly Ash 901.02
Geotextile 918.02
Joint Spacers and Joint Covering .....901.10(b)

SECTION 731, BEGIN LINE 239, DELETE AND INSERT AS FOLLOWS:

731.07 Foundation Preparation

(a) General

~~The~~*Prior to wall construction, the* foundation for the structure shall be graded ~~level~~ for a width equal to or exceeding the length of the ground reinforcement or as shown on the plans. ~~Prior to wall construction, t~~*T*he foundation, if not in rock, shall *then* be compacted in accordance with 203. *After the foundation has been compacted, the resulting grade of the foundation shall be 1 in. per foot sloped from the back of the foundation downward toward the leveling pad. The portion of the foundation beneath the leveling pad shall not be sloped.* The ~~base of the wall excavation~~*foundation* shall be proofrolled ~~with approved compacting equipment~~*in accordance with 203.26*. If unsuitable foundation material is encountered, it shall be removed and replaced with B borrow in accordance with 211.02 and compacted in accordance with 211.04.

(b) Leveling Pad Foundation

After the foundation has passed proofrolling, compaction of the portion of the foundation beneath the leveling pad will be verified by dynamic cone penetrometer, DCP, testing in accordance with ITM 509.

A DCP measurement is defined as the number of blows per 6 in. increment for a total penetration of 30 in. The minimum number of blows of the DCP for each 6 in. increment is five blows per each 6 in. increment in order for the foundation material beneath the MSE leveling pad to be considered acceptable. There will be five sets of DCP readings at each measurement location.

The frequency of DCP measurements is one DCP measurement for every 50 ft of linear MSE wall or five DCP measurements per end bent. If, on an end bent, an MSE wingwall is more than 1.5 times the length of the MSE abutment wall, that MSE wingwall will be considered a linear MSE wall for DCP measurement purposes.

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

~~*Areas not meeting ITM 509*~~*Unsuitable areas shall be removed, replaced, and compacted in accordance with 203 and 211*~~*, as directed*~~*. DCP verification of the level of compaction beneath the leveling pad will not be required if the foundation is in an embankment section that is constructed in accordance with 203.*

An unreinforced concrete leveling pad shall be provided at each foundation level as shown on the plans. The leveling pad shall be cured in accordance with 702.22 for a minimum of 12 h before placement of concrete face panels.

SECTION 731, BEGIN LINE 348, INSERT AS FOLLOWS:

The work shall also include B borrow backfilling above a theoretical 1:1 slope behind the ground reinforcement as shown on the plans.

When structure backfill type 3 ~~*nominal size aggregates 1 in. or 1/2 in., or*~~ *coarse aggregate No. 5, No. 8, No. 9, or No. 11,* ~~*or No. 12*~~ *are used in the reinforced backfill zone, geotextiles shall be installed vertically between the interface of the reinforced backfill zone and the backfill behind the reinforced portion of the MSE volume or the retained soil. If the same material is used for both the reinforced backfill zone and the backfill area behind the reinforced backfill zone, geotextiles will not be required to be placed vertically between the interface. Geotextiles shall instead be required between the backfill area behind the reinforced backfill zone and the native soil. Geotextiles shall also be installed horizontally across the top of the reinforced backfill zone.*

SECTION 731, BEGIN LINE 389, DELETE AND INSERT AS FOLLOWS:

Concrete leveling pad will be measured by the linear foot. Common excavation will be measured by the cubic yard in accordance with 203.27(a) to the neat lines shown on the plans. Structure backfill and B borrow will be measured in accordance with 211.09. Unsuitable foundation materials, if found, will be measured in accordance with 211.09. Geotextile shall be measured in accordance with 616.12, except as otherwise specified herein. Underdrains for MSE walls and components of the internal drainage system will be measured in accordance with 718.09. ~~Geotextile materials used as joint covering will not be measured.~~*If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the removal, replacement, and compaction of the new material will be measured in accordance with 203 and 211.*

Geotextile materials used as joint covering will not be measured. Precast or cast-in-place concrete coping will not be measured.

SECTION 731, AFTER LINE 432, INSERT AS FOLLOWS:

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the cost of removal, replacement, and compaction of new material will be paid for in accordance with 203 and 211.

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad that is constructed on an embankment section that is constructed under the same contract, the cost of removal, replacement, and compaction of new material shall be included in the cost of the leveling pad.

SECTION 735, BEGIN LINE 44, DELETE AND INSERT AS FOLLOWS:

735.04 Submittals

The Contractor shall submit working drawings ~~and design calculations~~ in accordance with 105.02. *The Contractor shall submit design calculations in accordance with 105.02 and the following additional requirements. In case of discrepancy, the requirements listed below supersede those listed in 105.02. Design calculations shall show the complete design of the temporary wire-faced wall. Calculations may be in either longhand or computer-printout format and must follow a systematic and logical methodology. A summary sheet that shows design assumptions and their source, controlling parameters and load cases, and other pertinent input and output information shall be attached to the calculations package.* Wall construction operations shall not begin until the Contractor receives written notice that the working drawings are approved.

SECTION 735, BEGIN LINE 121, DELETE AND INSERT AS FOLLOWS:

Common excavation will be measured in accordance with 203.27. Structure backfill and B borrow will be measured in accordance with 211.09. Unsuitable foundation materials, if found, will be measured in accordance with 211.09. ~~Geotextile materials will not be measured.~~ *If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the removal, replacement, and compaction of the new material will be measured in accordance with 203 and 211.*

Geotextile materials will not be measured. Drainage of the backfill including piping, aggregates, and incidentals will not be measured.

SECTION 735, BEGIN LINE 143, INSERT AS FOLLOWS:

The cost of all MSE retaining wall components including wire-facing elements, concrete face panels, ground reinforcing, tie strips, fasteners, soil retention materials, repair or replacement of wire-facing elements damaged or removed due to backfill placement, and incidentals shall be included in the cost of temporary wire-facing.

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the cost of removal, replacement, and compaction of new material will be paid for in accordance with 203 and 211.

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad that is constructed on an embankment section that is constructed

REVISION TO SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSED NEW RSP 731-B-XXX MSE RETAINING WALL REQUIREMENTS

under the same contract, the cost of removal, replacement, and compaction of new material shall be included in the cost of the leveling pad.

7.5 Granular Materials. For granular materials, the strength of the material is measured after completion of compaction for each 18 in. of the material. Prior to measuring the blow count for 12 in., the DCP is penetrated into the material a depth of 6 in. The number of blows of the DCP is measured for a penetration from 6 in. to 18 in. into the granular material.

7.6 Foundation Material Beneath MSE Leveling Pad. *For the foundation material beneath the leveling pad of an MSE retaining wall, the strength of the material is measured after the MSE foundation has been compacted and proofrolled. The number of blows is measured for each 6 in. increment of penetration into the material for a total penetration of 30 in.*

7.6.1 *The minimum number of blows of the DCP for each 6 in. increment is 5 blows per each 6 in. increment in order for the foundation material beneath the MSE leveling pad to be considered acceptable. A DCP measurement is defined as the number of blows per 6 in. increment for a total penetration of 30 in. (There will be 5 sets of DCP readings at each measurement location).*

7.6.2 *The frequency of DCP measurements is one DCP measurement for every 50 ft of linear MSE wall or five DCP measurements per end bent. If, on an end bent, an MSE wingwall is more than 1.5 times the length of the MSE abutment wall, that MSE wingwall is considered a linear MSE wall for DCP measurement purposes.*

8.0 REPORT. Report the number of blows to obtain the required penetration of the DCP.

COMMENTS AND ACTION

731-B-XXX MSE RETAINING WALL REQUIREMENTS

DISCUSSION: This item was introduced by Mr. Pankow who explained the difficulties related to the proofrolling of the foundation. Mr. Reilman explained each revision made as illustrated in this proposal. Mr. Walker explained the coarse and fine aggregate sizes and how they were introduced into 731, and suggested that No. 5 aggregates be added. Mr. Siddiki further explained why the No 5's should be allowed to be used.
Each revision was reviewed, explained and revised as needed. These revisions are as shown.
There was much discussion concerning the leveling pad foundation and the testing DCP requirements and that the test criteria should be stated in the specification. All of 7.6 from the ITM has been moved to the leveling pad foundation section.

Considerable discussion ensued concerning the vertical placement of geotextiles. The revised language is a shown herein.

Mr. Osborn stated that the Contractors would like to get paid for the structural backfill as a part of the MSE wall.

Mr. Pankow asked to approve this as revised, following some word-smithing, the results of which followed and are shown in these minutes.

Motion: Mr. Pankow Second: Ms. Phillips Ayes: 9 Nays: 0	Action: _____ Passed as Submitted __X__ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: 211.03.1 pg 203; 731 pg 6993 thru 702; 735 pg 711 thru 712. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: SECTION 410-5.0 GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications Book ____ Revise Pay Items List __X__ Create RSP (No. 731-B-205) Effective April 01, 2014 Letting RSP Sunset Date: TBD ____ Revise RSP (No.____) Effective ____ Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____ Letting ____ Technical Advisory GIFE Update Req'd.? Y __X__ N __ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? YES

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Issues discovered related to the notes and drawing views on Standard Drawings 610-MBAP-01 and -02.

PROPOSED SOLUTION: See attached markups for proposed editorial revisions to Standard Drawings 610-MBAP-01 and -02. These revisions include correction of language in notes, correction of titles of drawing views (sheet -01), addition of text to drawing titles, update of drawing format and title blocks, addition of shoulder break (sheet -01) and callouts, and rearrangement of drawing views to show typical configuration first.

APPLICABLE STANDARD SPECIFICATIONS: n/a

APPLICABLE STANDARD DRAWINGS: 610-MBAP-01, 610-MBAP-02

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

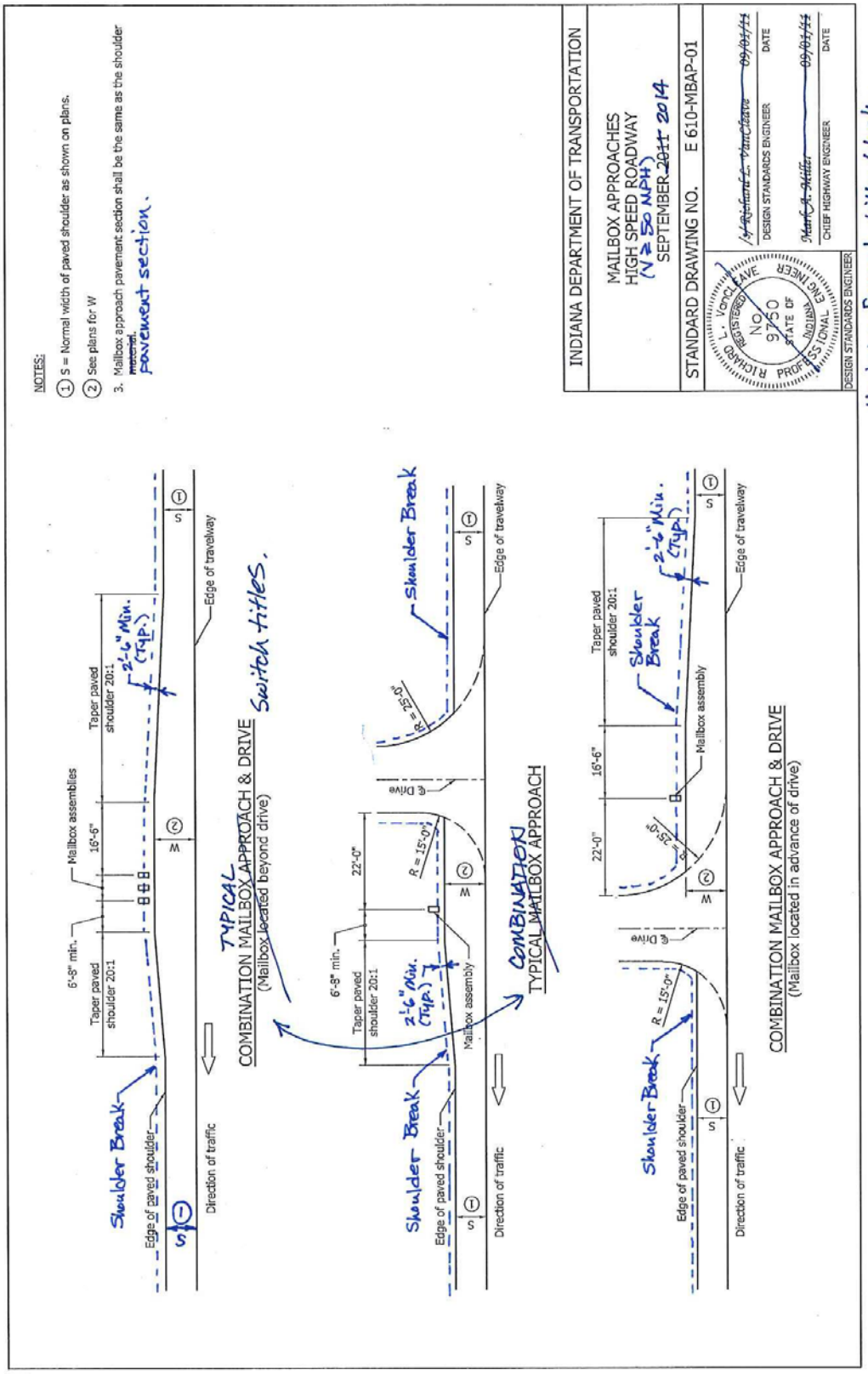
Phone Number: 232-5347

Date: Nov. 12, 2013

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

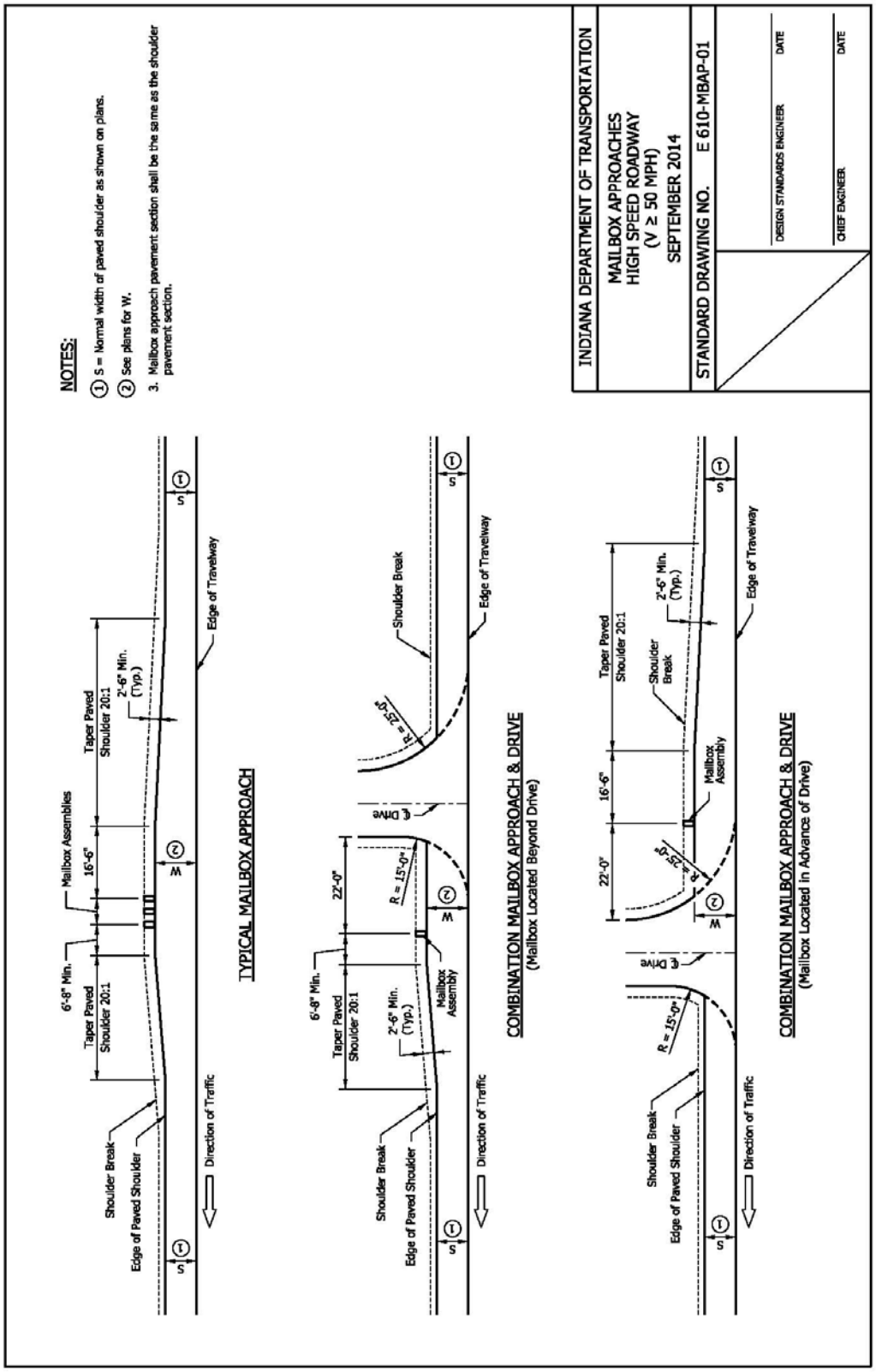
REVISION TO STANDARD DRAWINGS

610-MBAP-01 MAILBOX APPROACHES HIGH SPEED ROADWAY (WITH MARKUPS)



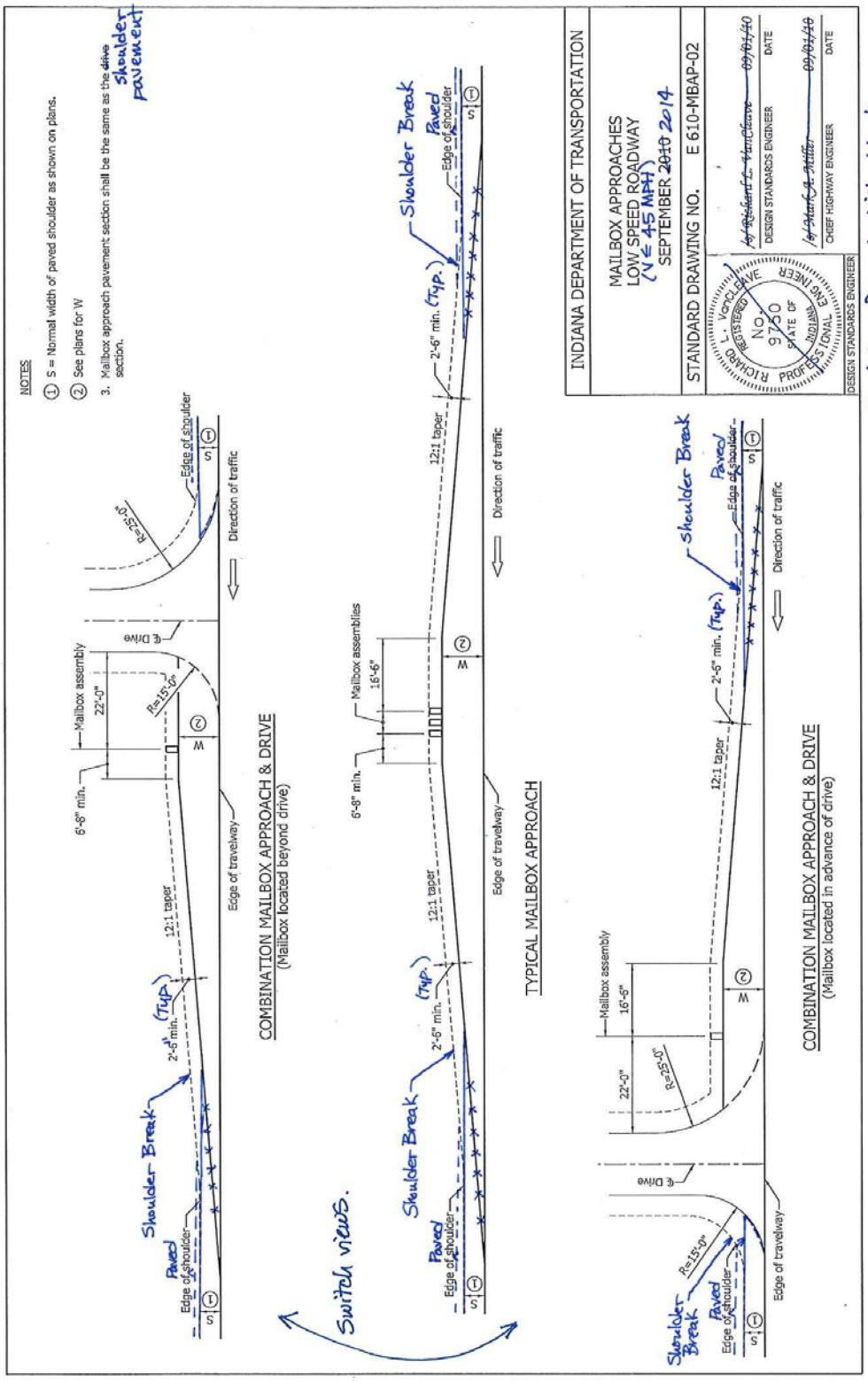
REVISION TO STANDARD DRAWINGS

610-MBAP-01 MAILBOX APPROACHES HIGH SPEED ROADWAY (DRAFT)



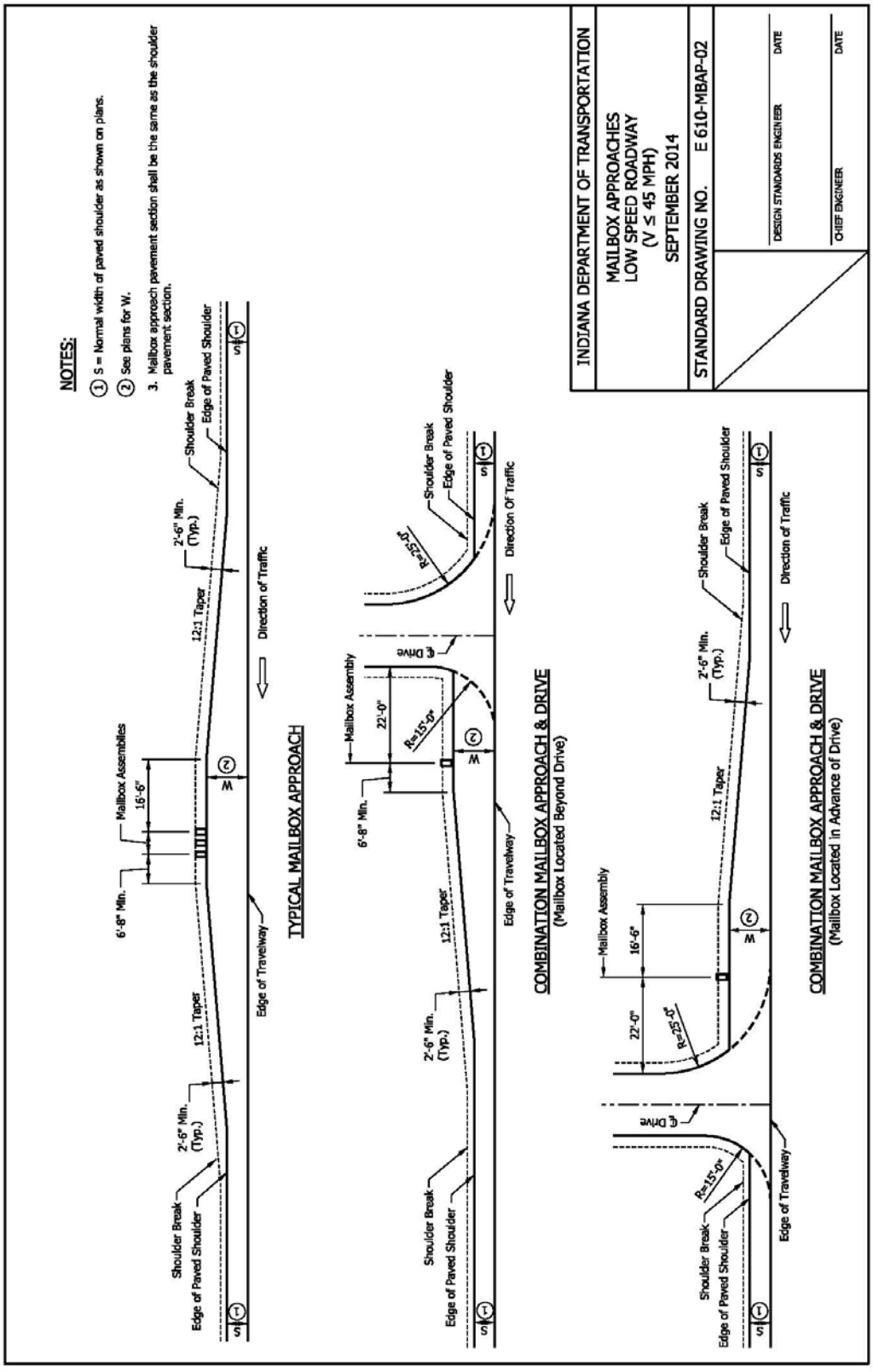
REVISION TO STANDARD DRAWINGS

610-MBAP-02 MAILBOX APPROACHES LOW SPEED ROADWAY (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

610-MBAP-02 MAILBOX APPROACHES LOW SPEED ROADWAY (DRAFT)



COMMENTS AND ACTION

610-MBAP-01 MAILBOX APPROACHES HIGH SPEED ROADWAY
610-MBAP-02 MAILBOX APPROACHES LOW SPEED ROADWAY

DISCUSSION: Mr. Vancleave introduced and presented this item explaining that the revisions to the drawings are editorial. The revisions include correction of language in the notes, corrections to the titles of drawing views, updating the drawing format and title blocks, as well as rearranging the drawing views for clarity.

Mr. Miller stated that these are editorial revisions and do not require a vote.

Motion: Mr. Vancleave Second: Mr. Ayes: Nays:	Action: _____ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: 610-MBAP-01 MAILBOX APPROACHES HIGH SPEED ROADWAY 610-MBAP-02 MAILBOX APPROACHES LOW SPEED ROADWAY Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications Book ____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ ____ Revise RSP (No.____) Effective ____ Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____ Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? _____

Ms. Phillips
Date: 12/19/13

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Reinforced Concrete Bridge Approach standard drawings deleted in 2012 and moved to the Indiana Design Manual. The pavement ledge and the approach slab extensions remained part of the Standard Drawings. Office of Standards desires to return the RCBA to the standard drawings as well as incorporate revision agreed to by the ASCE-INDOT Structures Committee.

PROPOSED SOLUTION: Include RCBA details as part of the existing 609-RCBA standard drawings.

APPLICABLE STANDARD SPECIFICATIONS: 609

APPLICABLE STANDARD DRAWINGS: 609-RCBA

APPLICABLE DESIGN MANUAL SECTION: 17, 52, 404 and 409

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

Submitted By: Elizabeth Phillips

Title: Manager Office of Standards and Policy

Organization: Division of Bridges

Phone Number: 232-6775

Date: 12/2/13

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ASCE-INDOT Structures Committee

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 609 – REINFORCED CONCRETE BRIDGE APPROACHES
609.02 MATERIALS
609.13 METHOD OF MEASUREMENT
609.14 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 609, BEGIN LINE 10, INSERT AS FOLLOWS:

609.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate, Class D or Higher, Size No. 53	904
Concrete, Class C*	702
Curing Materials	912.01
Joint Materials	906.02(a)1
Reinforcing Bars, Epoxy Coated	910.01
Support Devices	910.01(b)9
Surface Seal	*709.02*
Threaded Tie Bar Assembly	*910.01(b)2*

*Coarse Aggregate shall be Class AP, Size No. 8

SECTION 609, BEGIN LINE 127, INSERT AS FOLLOWS:

609.13 Method of Measurement

Reinforced concrete bridge approaches, including extensions required for bridge railing transitions, will be measured by the square yard. Dense graded subbase will be measured in accordance with 302.08. Reinforcing bars will be measured in accordance with 703.07. *Threaded tie bar assemblies will be measured in accordance with 703.07. Surface seal will be measured in accordance with 709.07.*

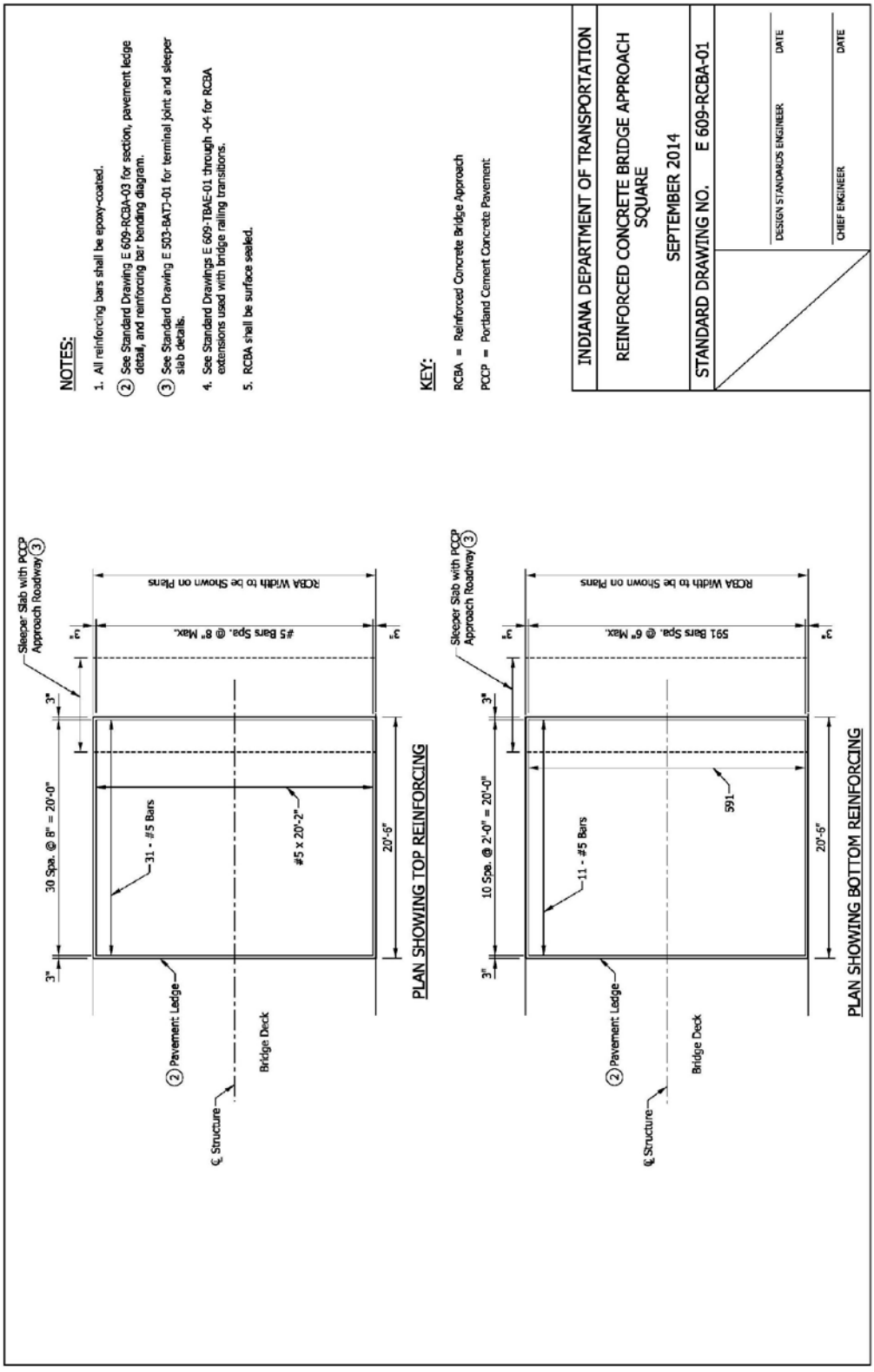
SECTION 609, BEGIN LINE 137, INSERT AS FOLLOWS:

609.14 Basis of Payment

Reinforced concrete bridge approaches, including extensions required for bridge railing transitions, will be paid for at the contract unit price per square yard. Dense graded subbase will be paid for in accordance with 302.09. Reinforcing bars will be paid for in accordance with 703.08. *Threaded tie bar assemblies will be paid for in accordance with 703.08. Surface seal will be paid for in accordance with 709.08.*

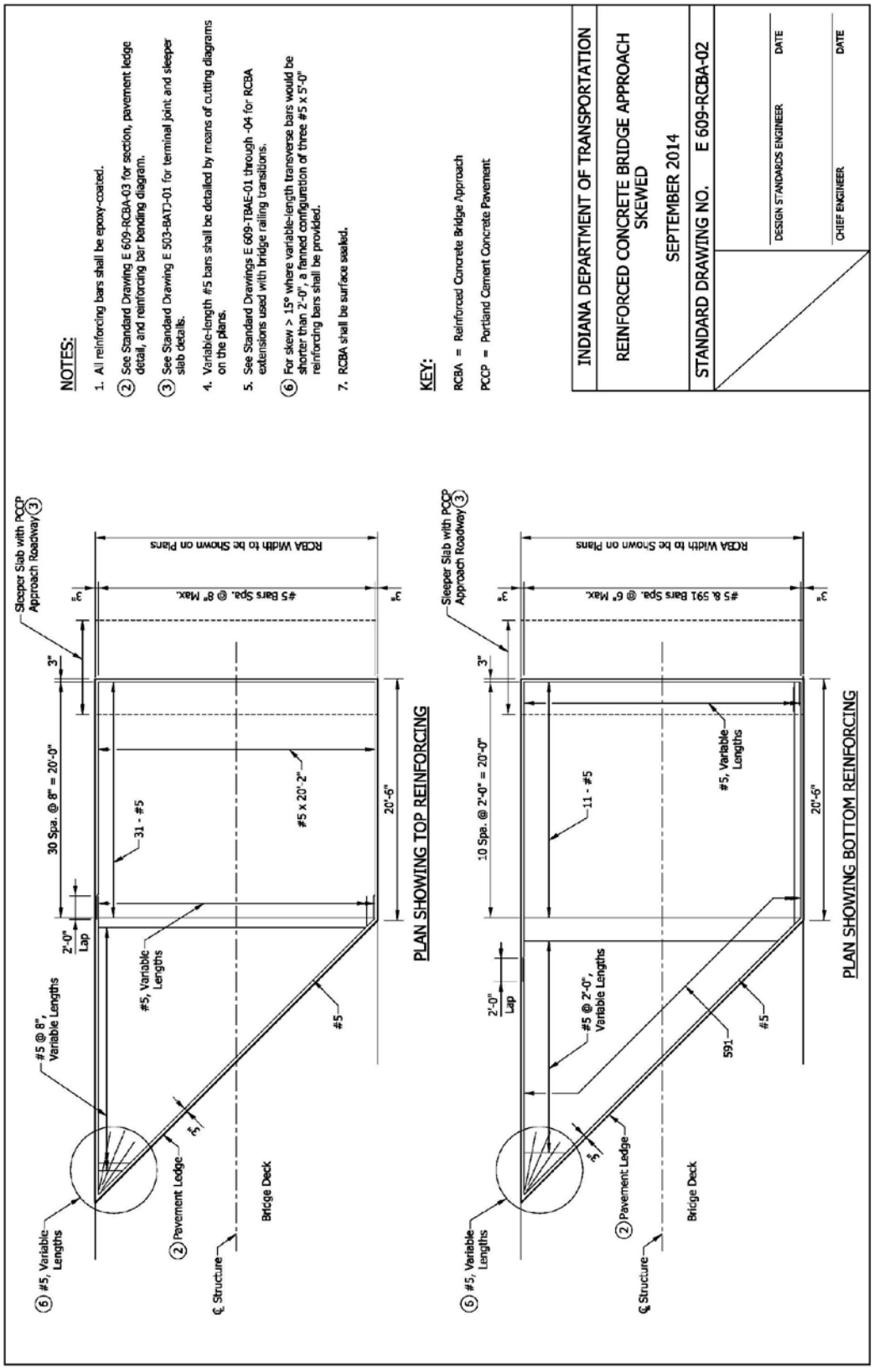
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

609-RCBA-01 REINFORCED CONCRETE BRIDGE APPROACH SQUARE (REVISED DRAFT)



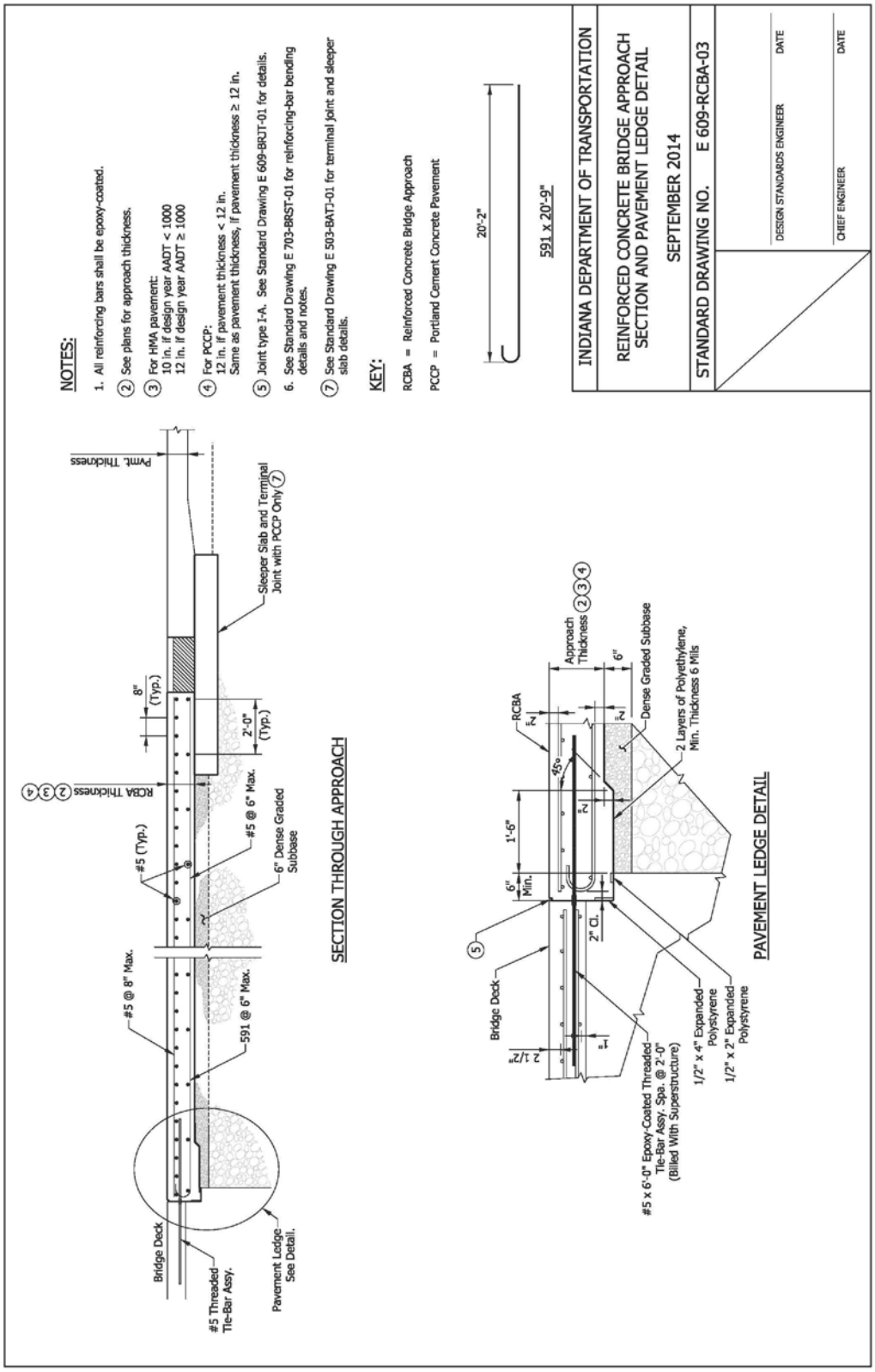
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

609-RCBA-02 REINFORCED CONCRETE BRIDGE APPROACH SKEWED (REVISED DRAFT)



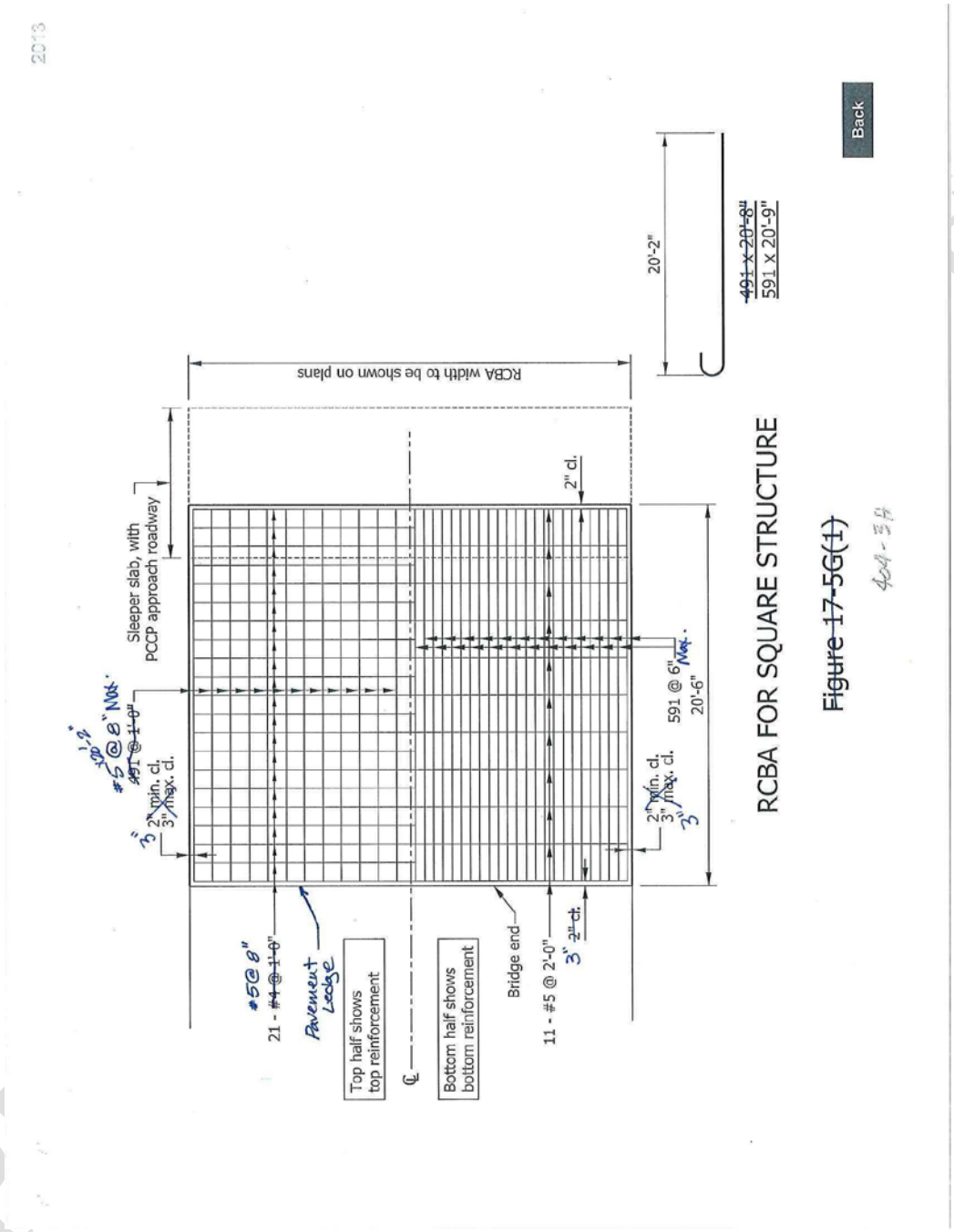
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH SECTION AND PAVEMENT LEDGE DETAILS (DRAFT)



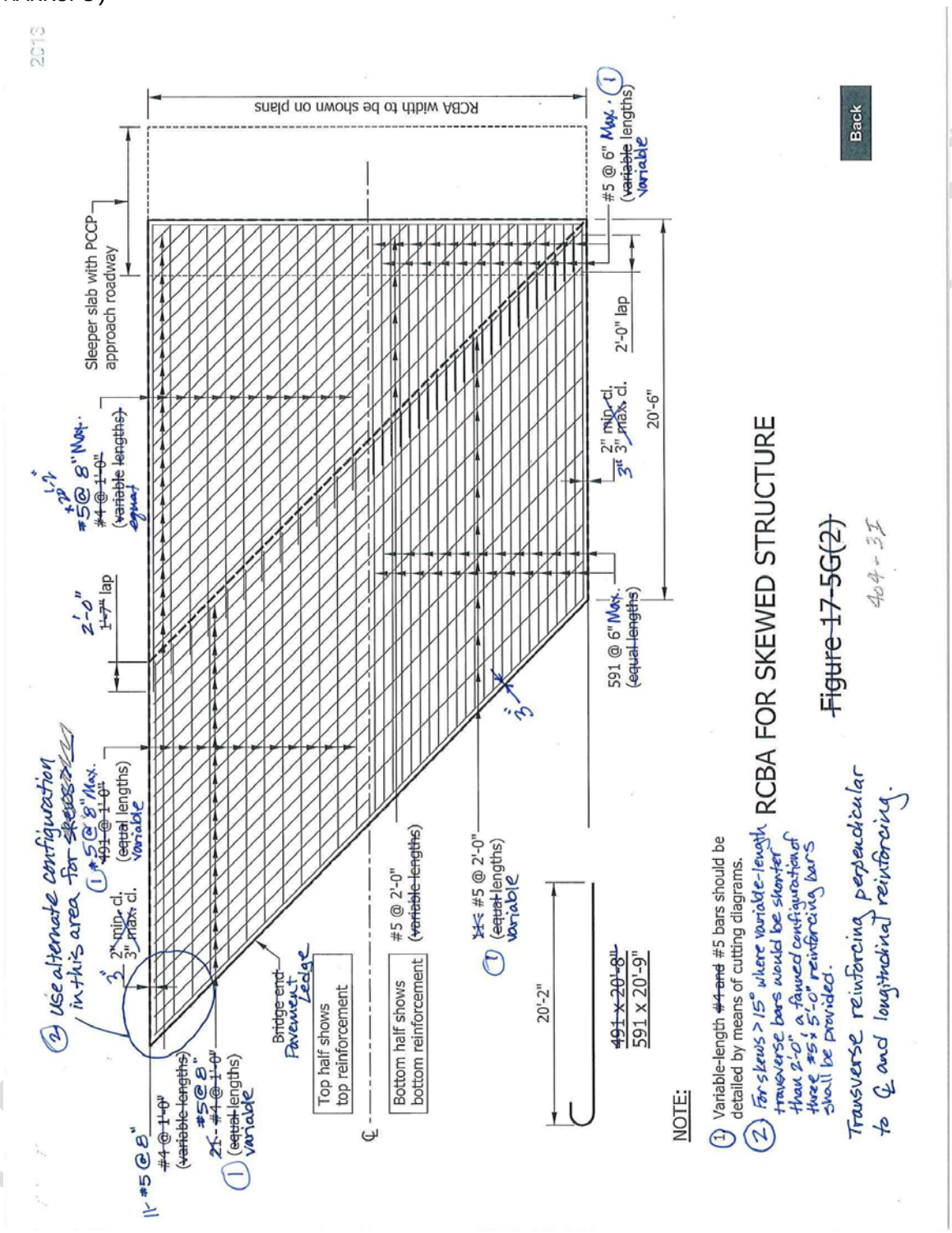
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM FIGURE 17-5G(1). RCBA FOR SQUARE STRUCTURE (WITH MARKUPS)



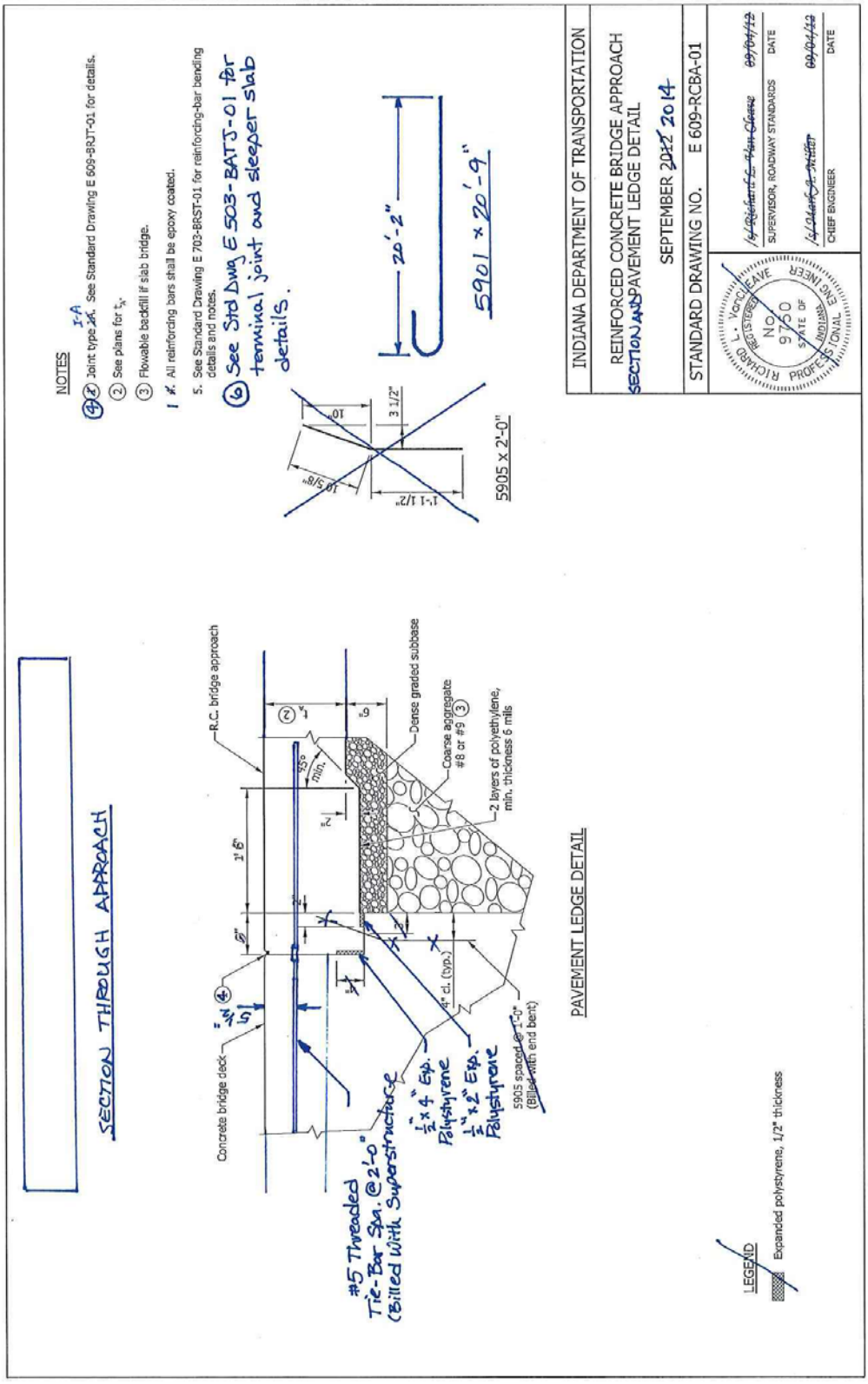
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM FIGURE 17-5G(2). RCBA FOR SKEWED STRUCTURE (WITH MARKUPS)



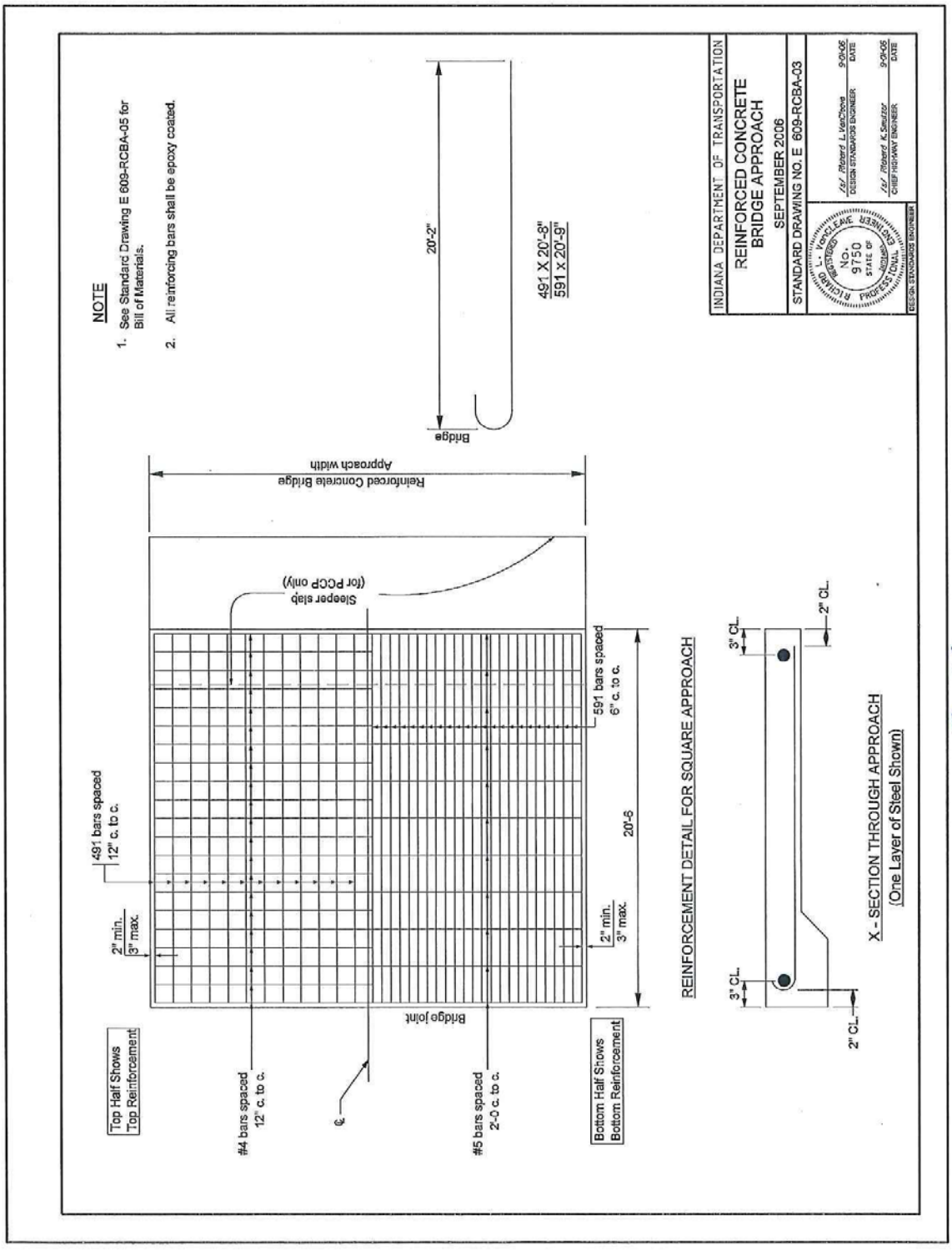
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 02. 609-RCBA-01 REINFORCED CONCRETE BRIDGE APPROACH (WITH MARKUPS)



REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

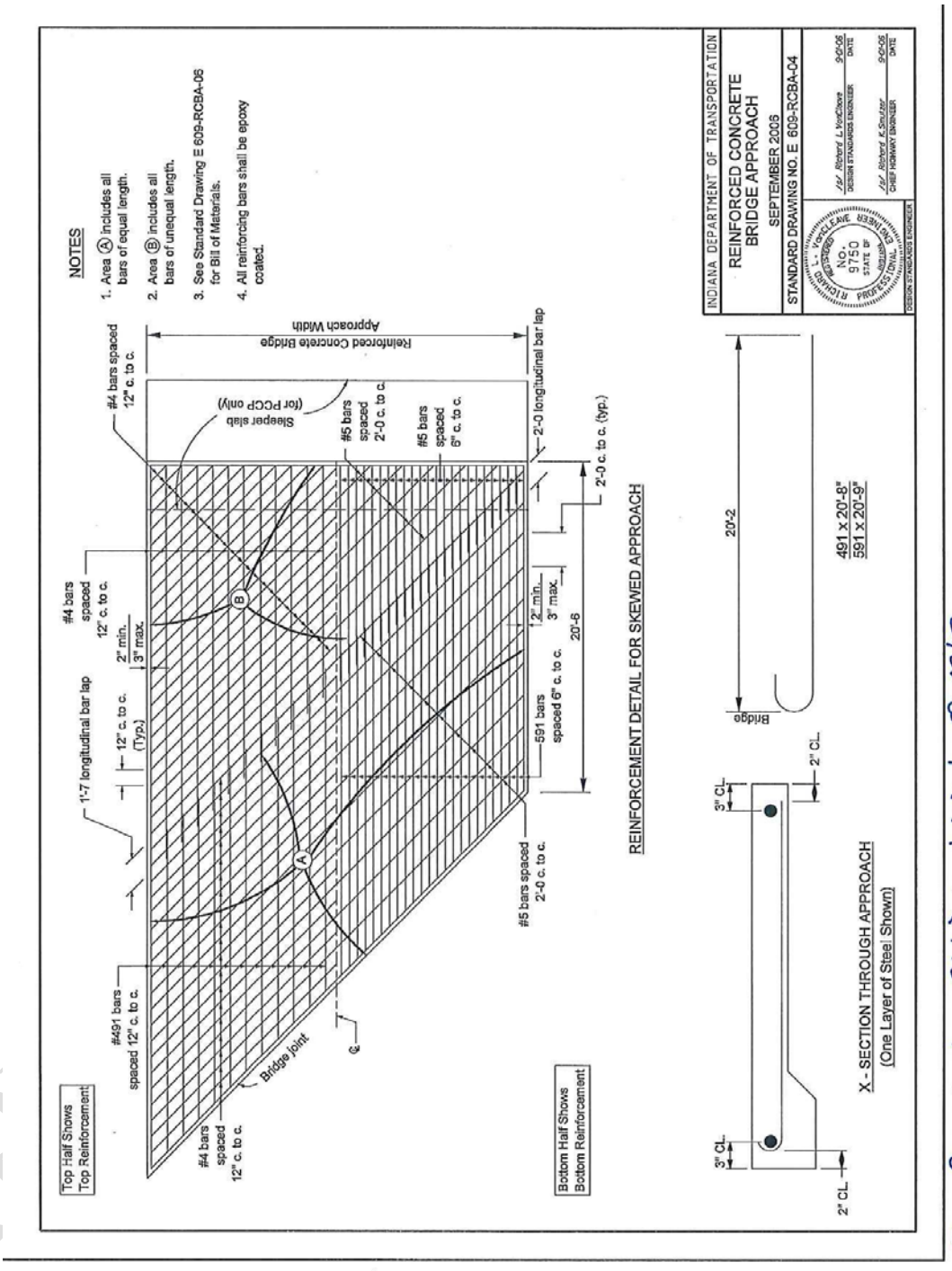
BACKUP 02. 609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH (DELETED AND ARCHIVED, FOR REFERENCE ONLY)



For reference only - Std Dwg deleted eff. 09/12

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 02. 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH (DELETED AND ARCHIVED, FOR REFERENCE ONLY)



For reference only - Std Dwg deleted eff. 09/12

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 03. IDM 17-5.09 REINFORCED CONCRETE BRIDGE APPROACH (WITH REVISIONS)

17-5.09 Reinforced Concrete Bridge Approach (RCBA) [Rev. July 2012, Nov. 2013]

17-5.09(01) Miscellaneous Requirements [Rev. July 2012, Nov. 2013]

~~The designer should provide complete RCBA details on the bridge plans.~~

~~1. Dimensions. The RCBA length, width, skew, thickness, reinforcement, and bill of materials should be determined and shown on the plans. Such information is no longer included on the INDOT *Standard Drawings*. The width should equal the bridge clear roadway width. The thickness should be determined as shown on Figure 17-5G. Guidance regarding layout and reinforcing bars placement is shown on Figure 17-5G(1) for a square structure, or Figure 17-5G(2) for a skewed structure. The length and width should be shown on the General Plan sheet.~~

~~2. Anchoring. The RCBA should be anchored to the end of the superstructure where integral end bent construction is used. The RCBA should be anchored to the adjacent mudwall where a bridge deck expansion joint is used at the end of the superstructure. See Chapter 409 for connection details.~~

~~3. Polyethylene Fabric. Two layers of polyethylene fabric, each of minimum thickness 0.02 in., should be placed between the RCBA and the dense-graded subbase where the RCBA is anchored to the superstructure.~~

~~4. Terminal Joint. If the approach roadway is PCCP, a terminal joint as shown on INDOT *Standard Drawings* should be provided at the roadway end of the RCBA. No such joint is required if the approach roadway pavement is HMA.~~

~~5. Extension for Bridge Railing Transition. An extension should be provided under each bridge railing transition as shown on INDOT *Standard Drawings*. The extension should be considered part of the RCBA, and not part of the transition.~~See Section 404-3.05 for information regarding design of RCBA.

17-5.09(02) Quantities [Rev. July 2012]

Quantities for the following pay items should be included on the Bridge Summary sheet, in the Summary of Bridge Quantities table, separate from other bridge quantities.

1. RCBA of the required thickness, including extensions for bridge-railing transitions, per square yard.

2. Epoxy-coated reinforcing bars in the RCBA and extensions, per pound.

3. Dense-graded subbase placed under the RCBA and extensions, per cubic yard.

4. Terminal joint, including sleeper slab and reinforcing bars, per linear foot.

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 04. IDM 52-9.03 REINFORCED-CONCRETE BRIDGE APPROACH (WITH REVISIONS)

52-9.03(03) Reinforced-Concrete Bridge Approach (RCBA)

The requirements for an RCBA are shown the INDOT *Standard Specifications*. RCBA is constructed on dense-graded subbase on prepared subgrade.

An RCBA is used at a bridge to transition from PCC or HMA pavement to the bridge deck or mudwall. For PCCP, the RCBA spans from the sleeper slab to the pavement ledge on the mudwall. For HMA pavement, the RCBA spans from the end of the HMA pavement to the pavement ledge on the mudwall. The RCBA is reinforced to account for unsupported conditions due to settlement at the end bent or abutment. The RCBA and reinforcing-steel details are shown on the INDOT *Standard Drawings*. See Section 404-3.05 for a discussion of design requirements for an RCBA.

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 05. IDM 404-3.05 REINFORCED CONCRETE BRIDGE APPROACH

404-3.05 Reinforced Concrete Bridge Approach [Added Nov. 2013]

The reinforced-concrete bridge approach (RCBA) is designed to span the abutment to the roadway pavement. When the roadway pavement is PCCP, the RCBA is supported by a sleeper slab beneath the end of the roadway pavement. When the roadway pavement is HMA, no sleeper slab is required and the RCBA is supported by compacted fill throughout.

The designer should provide complete RCBA details on the bridge plans, including the RCBA length, width, skew, thickness, reinforcement, and bill of materials. The RCBA must be designed in accordance with the following requirements.

1. Reinforcing. The RCBA contains two layers of reinforcing. The top layer consists of #5 epoxy-coated bars placed both longitudinally and transversely, and spaced at 8" on center. The bottom layer consists of #5 bars placed transversely on 2'-0" centers and hooked #5 bars placed longitudinally on 6" centers. In each layer, the transverse bars are placed perpendicular to the structure centerline. See Figures 404-3H and 404-3 I and the INDOT *Standard Drawings* for reinforcing bar configurations.

2. Thickness. The thickness of the RCBA depends on the type and thickness of the roadway approach pavement and is determined as follows:

   a.. For HMA pavement roadway approach:
      i. RCBA thickness is 10 in. when the AADT < 1000.
      ii. RCBA thickness is 12 in. when the AADT ≥ 1000.

   b. For PCCP roadway approach:
      i. RCBA thickness is 12 in. if the pavement thickness is less than 12 in.
      ii. RCBA thickness is equal to the pavement thickness for pavements having thickness 12 in. or greater.

3. Dimensions. The minimum length of an RCBA is 20'-6". The width should equal the bridge clear-roadway width. For skewed structures, the RCBA is squared off at the roadway pavement end in order to provide a terminal or construction joint that is perpendicular to the centerline of the roadway. See the INDOT *Standard Drawings* for sample details for square and skewed structures.

4. Anchoring. The RCBA should be anchored to the end of the superstructure with #5 threaded tie-bars spaced at 2'-0" where integral or semi-integral end bent construction is used. The RCBA should be anchored to the adjacent mudwall where a bridge deck expansion joint is used at the end of the superstructure. See Chapter 409 for connection details.

5. Polyethylene Fabric. Two layers of polyethylene fabric, each of minimum thickness 0.02 in., should be placed between the RCBA and the dense-graded subbase where the RCBA is anchored to the superstructure.

6. Terminal Joint. If the approach roadway is PCCP, a terminal joint as shown on INDOT *Standard Drawings* and in Figure 404-3G should be provided at the roadway end of the RCBA. No such joint is required if the approach-roadway pavement is HMA.

7. Extension for Bridge-Railing Transition. An extension should be provided under each bridge-railing transition as shown on INDOT *Standard Drawings*. The extension should be considered part of the RCBA, and not part of the transition when calculating quantities. See Section 17-5.09 for details related to reporting RCBA-related quantities.

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 05. IDM 404-4.04 BRIDGE-RAILING TRANSITION

404-4.04 Bridge-Railing Transition

A steel-element roadside barrier will deflect upon impact, but a rigid bridge railing normally will not. Therefore, where a steel-element roadside barrier approaches a rigid bridge railing, a transition is necessary to gradually strengthen the steel-element roadside barrier as it approaches and connects to the bridge railing. The following will apply to such transitions.

404-4.04(01) Type

The preferred transition for each bridge-railing type is shown in Figure 404-4B. Most systems include both a guardrail transition and a bridge-railing transition. The details are shown on the INDOT *Standard Drawings* identified in Figure 404-4B.

A transition is typically used at each location, except where an intersecting road or driveway prevents the placement of a proper device. To use the bridge-railing transition listed, there shall be space to place at least 25 ft of roadside barrier between a curved W-beam guardrail connector terminal system or curved W-beam guardrail system and the beginning of a guardrail transition type TGB.

Bridge-railing transition type WBC is not identified in Figure 404-4B. It may be used with concrete bridge railing type FC, only where the proximity of an intersecting road or driveway prevents the proper installation of the preferred transition. Where at least one bridge-railing transition type WBC is required, such transition shall be used for all bridge-railing ends.

404-4.04(02) Location

The following will apply to the location of a bridge-railing transition.

1. Reinforced-Concrete Bridge Approach (RCBA). The ideal treatment is to locate a bridge-railing transition along the RCBA. This will keep the deck drainage not collected in the deck drains from flowing down the spill slopes at the bridge corners, which can cause erosion at the end bents. Placing the transition on the RCBA will require moving the connection between the bridge-railing transition and the guardrail transition a sufficient distance from the wing to allow placement of the posts required with the transition.

2. Bridge Corner. A transition shall be used at each bridge corner for each bridge-railing type, including the trailing end of a bridge railing on a one-way roadway, such as a ramp, or one roadway of a divided highway.

3. Bridge Deck. If it is necessary to locate the transition on the bridge deck, the wings shall be extended laterally a sufficient distance to provide a minimum clearance of 6 in. between the roadside face of the wing and the backs of the guardrail-transition posts.

4. Intersecting Road or Drive. The presence of an intersecting road or drive close to the bridge can complicate the location of the transition. Where practical, the intersecting road or drive shall be relocated to allow placement of the bridge-railing transition on the RCBA. Where this is not practical, the consideration of the bridge-railing transition shall be determined in the order of preference as follows:

   a. it shall be placed on the bridge deck if the structure has integral or semi-integral end bents;

   b. a modified version of the bridge-railing transition that may be used with guardrail transition type WGB shall be placed on the RCBA;

   c. a modified version of the bridge-railing transition that may be used with guardrail transition type WGB shall be placed on the bridge deck if the structure has integral end bents;

   d. an impact attenuator shall be used at the end of the bridge railing; or

   e. since standard details for modified versions of bridge-railing transitions that may be used with the guardrail transition type WGB are not available, details of a modified version of the appropriate concrete-bridge-railing transition shall be included in the plans if an intersecting drive or public road approach cannot be relocated away from the end of the structure.

5. Expansion Joint. The bridge-railing transition may not be located on the bridge deck if a deck expansion joint is located between the bridge deck and the mudwall.

6. Alternative Location. In a situation with severe space restrictions, transition location or design modifications which do not comply with the above criteria may be necessary.

COMMENTS AND ACTION

609.02 MATERIALS
609.13 METHOD OF MEASUREMENT
609.14 BASIS OF PAYMENT
609-RCBA-01 REINFORCED CONCRETE BRIDGE APPROACH SQUARE
609-RCBA-02 REINFORCED CONCRETE BRIDGE APPROACH SKEWED
609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH SECTION AND PAVEMENT LEDGE DETAILS

DISCUSSION: Ms. Phillips introduced and presented this item explaining that 609 and the attached standard drawings needed to be revised to include the use of threaded tie bar assemblies. Ms. Phillips addressed the highlights of the revisions presented, indicating the introduction of the threaded tie bars relating to constructability issues.

One concern is providing a surface seal on approach slabs, and how to incorporate that into the spec. The surface seal can be added to the list of materials and referenced in the Maintenance of Materials and Basis of Payment to be in accordance with 709.

Coordination with our estimating department revealed that there is a supplemental description to differentiate between various bridge structures for the Surface Seal pay item, if there is more than one bridge in the contract.

Another concern involves saw cutting. Saw cutting is addressed in 609.05 and, according to Ms. Phillips, random cracking should not be much of a concern since the steel mat has been tightened up using bigger bars, and then surface sealing is applied. Mr. Zander spoke out against saw cutting since it would allow water and chlorides to infiltrate the concrete causing undue deterioration of the concrete, so he would prefer to not have that joint.

Ms. Phillips motioned to accept this item as revised.

COMMENTS AND ACTION

609.02 MATERIALS
609.13 METHOD OF MEASUREMENT
609.14 BASIS OF PAYMENT
609-RCBA-01 REINFORCED CONCRETE BRIDGE APPROACH SQUARE
609-RCBA-02 REINFORCED CONCRETE BRIDGE APPROACH SKEWED
609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH SECTION AND PAVEMENT LEDGE DETAILS

(CONTINUED)

Motion: Ms. Phillips Second: Mr. Boruff Ayes: 9 Nays: 0	Action: _____ Passed as Submitted __X__ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: 609.02 pg 410; 609.13 pg 412 and 609.14 pg 413. Recurring Special Provision affected: NONE Standard Sheets affected: 610-RCBA (SEE PROPOSAL) Design Manual Sections affected: SEE BACKUPS GIFE Sections cross-references: NONE	__X__ 2016 Standard Specifications Book ____ Revise Pay Items List __X__ Create RSP (No. 609-B-296) Effective Sept. 01, 2014 Letting RSP Sunset Date: Sep. 01, 2015 ____ Revise RSP (No.____) Effective ____ Letting RSP Sunset Date: ____ Standard Drawing Effective Sept. 01, 2014 _____ Create RPD (No. ____) Effective ____ Letting ____ Technical Advisory GIFE Update Req'd.? Y __ N _X By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? YES