INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758 CM
Indianapolis, Indiana 46204

www.in.gov/indot

Eric Holcomb, Governor
Mike Smith, Commissioner

FINAL DRAFT MINUTES

March 17, 2022 Standards Committee Meeting

(Changes to the Agenda by the Action of the Committee shown as highlighted in yellow. Changes to the First Draft Minutes based on comments received shown highlighted teal.)

March 31, 2022

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the March 17, 2022 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow, Chair, at 09:05 a.m. on March 17, 2022. This meeting was held virtually via *Teams* (Microsoft application) and was adjourned at 10:57 a.m.

The following committee members were in attendance:

Gregory Pankow, Chairman, Director, Construction Management
John Wooden, Contract Administration Division (at item 5)
Dave Boruff, Traffic Engineering
Peter White, Bridge Engineering
Joseph Novak, Construction Management
Kumar Dave, Pavement Engineering
Jim Reilman, Materials and Tests Division
Michael Koch, District Construction, Fort Wayne District
Mark Orton, Highway Engineering
Kurt Pelz, Construction Technical Support
Anne Rearick, Engineering and Asset Management

Also, presence of the following throughout the meeting was captured by the *Microsoft Teams*:

Bazlamit, Subhi, INDOT
Blanchard, Jacob, INDOT
Fisher, Steve, INDOT
Mouser, Elizabeth, INDOT
Osborn, Dan, ICI
Susong, John, guest

Harris, Tom, INDOT
Duncan, Thomas, FHWA
Wortkoetter, Andrew, INDOT
Bruno, Joseph, INDOT
Eamon, Kelly, guest
Hailat, Mahmoud, INDOT
Smutzer, Katherine, INDOT
Thornton, Donald, INDOT
Hauser, Derrick, INDOT
Podorvanova, Lana, INDOT
Jacobs, David, INDOT
Trammell, Scott, INDOT
Bowen, Alisa, INDOT
Barney, Bruce, INDOT
Couch, Gregory, INDOT
Kachler, Mischa, INDOT
Sturgeon, Daniel (Dan), INDOT

The following items were discussed:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

*Mr. Novak stated that RSP 401-R-577 is ready for incorporation into the 2024 Standard Specifications Book. Also, the Basis for Use (BFU) for the RSP can now be changed to "~~As determined necessary by the Project Designer~~Required for all contracts with any **401** pay items.". This change will be shown on the MenuBFU scheduled to be posted on May 5, 2022 and to be used for lettings on or after September 1, 2022.*

NEW BUSINESS

1. *Approval of the Minutes from the February 17, 2022 meeting*

Mr. Pankow requested a motion to approve the Minutes from the February 17, 2022 meeting.

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

ACTION: PASSED AS SUBMITTED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

(No items were listed)

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

OLD BUSINESS

(No items were listed)

NEW BUSINESS

Item No. 1 (2022 SS) Mr. Novak pg 5
Recurring Special Provision:
108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION, NOT

ACTION: PASSED AS REVISED

Item No. 2 (2022 SS) Mr. Novak pg 10
Recurring Special Provision:
108-C-127 EARLIEST DATE TO BEGIN WORK

ACTION: PASSED AS SUBMITTED

Item No. 3 (2022 SS) Mr. Reilman pg 15
Standard Specifications:
601.02 Materials
910.10 Guardrail Posts
910.11 Guardrail Accessories, Fittings, and Hardware

ACTION: PASSED AS SUBMITTED

Item No. 4 (2022 SS) Mr. Reilman pg 21
Recurring Special Provision:
738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

ACTION: PASSED AS REVISED

Item No. 5 (2022 SS) Mr. Boruff pg 42
Standard Specifications:
107.12 Traffic Control Devices

801.08	Cones and Tubular Markers
801.18	Basis of Payment

Standard Drawings:

E 801-TCDV
E 801-TCLC
E 801-TCSC
E 801-TCTC
E 801-TCTS

Click here to view compiled set of these drawings showing markups.

ACTION: PASSED AS REVISED

Item No. 6 (2022 SS) Mr. Novak pg 88

Standard Specifications:

106.01(b)	Material Records
109.01(b)	Scales and Measurement by Weight (Mass)

ACTION: PASSED AS REVISED

Item No. 7 (2022 SS) Mr. Orton pg 96

Standard Drawings:

E 503-BATJ-02	TERMINAL JOINT, TYPE PCCP
E 503-BATJ-03	TERMINAL JOINT, TYPE HMA
E 609-RCBA-04	REINFORCED CONCRETE BRIDGE APPROACH - SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS

ACTION: PASSED AS SUBMITTED

cc: Committee Members
FHWA
ICI

Mr. Novak
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: 108-C-234 is used when the contract requires an IDEM NOT. It introduces an ICD in the first sentence of the RSP. Problem then occurs because the Area Engineer somehow has to associate liquidated damages (LD) with the ICD which is typically done with 108-C-094; but that RSP language limits LD assessment to road closure when the intent is to have all work complete; another problem is a pitfall whereby the LD amount is a fillable field which in the case of NOT should only be the spec book rate.

PROPOSED SOLUTION: Add language to include a Rule 5 intermediate completion date within the NOT RSP so another RSP is not needed. Add as a practice that the Rule 5 intermediate completion date will simply be included in Contract Prep Doc as part of time-set, no additional RSP.

APPLICABLE STANDARD SPECIFICATIONS: 108.09

APPLICABLE STANDARD DRAWINGS: n/a

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: 108-C-234

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: n/a

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: Same as current.

IMPACT ANALYSIS (attach report): Attached

Submitted By: Joe Novak

Title: State Construction Engineer

Organization: INDOT Construction Management

Phone Number: 317-501-7805
Date: 1/28/2022

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Approved Materials List? No
Will this proposal improve:

- Construction costs? N/A
- Construction time? N/A
- Customer satisfaction? N/A
- Congestion/travel time? N/A
- Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

- For motorists? N/A
- For construction workers? N/A

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? N/A
- Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

- Federal or State regulations? No
- AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: Necessary to prevent claims and ensure appropriate LD amounts are used.

REVISION TO SPECIAL PROVISIONS

108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION, NOT

(Note: Proposed changes shown highlighted gray)

108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION~~,~~ (NOT)

(Revised 02-20-14)

The time provided between the ~~*Rule 5*~~*Construction Stormwater General Permit, CSGP,* ~~I~~intermediate ~~C~~completion ~~D~~date and ~~C~~contract ~~C~~completion ~~D~~date is to allow the Contractor time to perform final remediation as well as inspect and report deficiencies for all erosion control features and to allow for the receipt of the IDEM Notice of Termination~~,~~ (NOT~~,~~) as required under the provisions of ~~*Rule 5*~~*the CSGP*. All other work on the contract shall be complete before the ~~*Rule 5*~~*CSGP* ~~I~~intermediate ~~C~~completion ~~D~~date *shown on the Proposal* ~~*page*~~*sheet. If the work is not complete on or before the* ~~*Rule 5*~~*CSGP intermediate completion date shown on the Proposal sheet, liquidated damages will be assessed* ~~*per*~~*in accordance with 108.09.*

Prior to the ~~C~~contract ~~C~~completion ~~D~~date, the Contractor shall maintain the project in accordance with 108.04 and 205, and complete all necessary erosion and sediment control inspections and reports. If the NOT is not received by the contract completion date, any required maintenance, inspections and reports will be paid as extra work in accordance with 104.03.

The Contractor shall establish vegetation in accordance with 621 and 622 and achieve a minimum coverage of 70% uniform vegetation density per Rule 5 requirements and will be based on the lowest density area on the project within any ground area of 9 sq ft. The Department will have sole discretion in verifying the 70% minimum coverage for the groundcover. If this threshold is not met by the ~~C~~contract ~~C~~completion ~~D~~date, the Contractor may be subject to liquidated damages in accordance with 108.09 if the items related to erosion and sediment control have not been accomplished in accordance with the contract~~ documents~~. The liquidated damages, if assessed, will be charged until such time that the Department is satisfied that the contract requirements have been met.

Any agreed upon soil amendments or additional extra work for which no items exist in the ~~itemized proposal~~*Schedule of Pay Items,* and are not covered elsewhere in the contract~~ documents~~, will be paid for in accordance with 104.03.

Final acceptance will not be granted until the IDEM NOT is received and all other work is completed.

COMMENTS AND ACTION

108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION, NOT

DISCUSSION:

This item was introduced and presented by Mr. Novak, who explained that RSP 108-C-234 is used when the contract requires an IDEM NOT. It introduces an ICD in the first sentence of the RSP. Problems then occur because the Area Engineer somehow has to associate liquidated damages, LD, with the ICD which is typically done with RSP 108-C-094; but that RSP language limits LD assessment to road closure when the intent is to have all work complete; another problem is a pitfall whereby the LD amount is a fillable field which in the case of NOT should only be the spec book rate.

Mr. Novak proposed to add language to include a Construction Stormwater General Permit, CSGP, (formerly Rule 5) intermediate completion date within the NOT RSP so another RSP is not needed. Mr. Novak also proposed to add as a practice that the CSGP intermediate completion date will simply be included in the Contract Prep Doc as part of the time-set, so no additional RSP will be needed.

Mr. Wooden pointed out an inconsistency in the language, so the word “page” in the first paragraph has been changed to “sheet”, as approved by Mr. Novak.

Mr. White mentioned that it is no longer called Rule 5. Mr. Novak concurred and made the minor revisions as shown, adding the “…, or Construction Stormwater General Permit”, to be consistent to what is shown in 205. Mr. Novak said that further revisions may be necessary in the near future as 205 gets updated.

Mr. Novak stated that the Basis For Use will need to be updated as well.

There was no further discussion and this item passed as revised.

COMMENTS AND ACTION

108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION, NOT

[CONTINUED]

Motion: Mr. Novak Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 108 begin pg. 83. Recurring Special Provision references in: 108-C-234 CONTRACT COMPLETION DUE TO IDEM NOTICE OF TERMINATION, NOT Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: TBD	___ 2024 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: _X_ Revise RSP (No. 108-C-234) Effective: September 1, 2022 RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: 108-C-127 is used when the contract requires an earliest date to start work. It includes a fillable field for liquidated damages. This conveys the option for a Contractor to start early when the Department may otherwise desire.

PROPOSED SOLUTION: Delete the fillable field and associated language for liquidated damages.

APPLICABLE STANDARD SPECIFICATIONS: 108.09

APPLICABLE STANDARD DRAWINGS: n/a

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: 108-C-127

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: n/a

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: Same as current.

IMPACT ANALYSIS (attach report): Attached

Submitted By: Joe Novak

Title: State Construction Engineer

Organization: INDOT Construction Management

Phone Number: 317-501-7805

Date: 1/28/2022

Mr. Novak
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Approved Materials List? No
Will this proposal improve:

- Construction costs? N/A
- Construction time? N/A
- Customer satisfaction? N/A
- Congestion/travel time? N/A
- Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

- For motorists? N/A
- For construction workers? N/A

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? N/A
- Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? N/A

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

- Federal or State regulations? No
- AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: Requested by the majority of Area Engineers

REVISION TO SPECIAL PROVISIONS

108-C-127 EARLIEST DATE TO BEGIN WORK

(Note: Proposed changes shown highlighted gray)

108-C-127 EARLIEST DATE TO BEGIN WORK

(Revised 04-25-21)

The Standard Specifications are revised as follows:

SECTION 108, AFTER LINE 553, INSERT AS FOLLOWS:

(e) Earliest Date to Begin Work

For a contract for which the completion time is a specified number of work days, calendar days, or is a calendar completion date, the earliest date to begin work will be as agreed upon by the Contractor and the Engineer. Such date shall not be earlier than the date shown on the Proposal sheet. ~~If the Contractor begins work before the earliest date to begin work as shown on the Proposal sheet, $_____ will be assessed as liquidated damages, not as a penalty, but as damages sustained, for each workable calendar day on which the Contractor does work. Time will then be charged in accordance with 108.03.~~

Preliminary field work, such as the placement of construction signs, staking, or verifying cross sections necessary to obtain information to initiate procurement of materials with lengthy delivery schedules, will not constitute work warranting time charges.

Requests for extensions to completion dates or intermediate completion dates due to delay in issuance of the notice to proceed beyond 30 days after the letting will not be considered unless the notice to proceed is issued less than 14 calendar days prior to the earliest date to begin work stated in the contract on the Proposal sheet.

COMMENTS AND ACTION

108-C-127 EARLIEST DATE TO BEGIN WORK

DISCUSSION:

Mr. Novak introduced and presented this item stating that RSP 108-C-127 is used when the contract requires an earliest date to start work. It includes a fillable field for liquidated damages. This conveys the option for a Contractor to start early when the Department may otherwise desire.

Mr. Novak proposed to delete the fillable field and associated language for liquidated damages.

Prior to the meeting:

Mr. Wooden expressed some confusion as to the wording in the Problems Encountered section of the proposal sheet.

Mr. Novak responded that he was merely trying to convey that Districts have various reasons for setting early start dates and they don't want a Contractor to even consider starting before then without getting approval. Mr. Wooden was satisfied with this response.

Mr. Duncan, FHWA, stated that the proposal eliminates liquidated damages for a Contractor starting work prior to the contract early start date. It would be beneficial to know what tools INDOT would impose if this language is removed. If it is a variety of tools, such as non-payment for work, contract termination, contractor evaluation ratings, LD assessment, or something else, then how will INDOT apply them consistently?

Mr. Novak responded that the primary tool would be a CPE rating which really hasn't changed. We have a number of questions that would cover this depending on the impact of the breach. Non-payment, or remove/replace, would only occur if the situation involved an unapproved subcontractor or if due to the absence of real-time inspection we could not verify the acceptability of the work performed. Mr. Novak further stated that we use termination only rarely. While it is possible, it is unlikely that would be used here. Terminations are done in coordination with Central Office Construction Management and Legal.

Mr. Reilman mentioned that by removing the fillable blank, that this could be moved to a section 1 RSP, and will this be incorporated into the next spec book? Mr. Novak said he will need to check with Contracts and make that decision at a later date.

There was no further discussion and this item passed as submitted.

COMMENTS AND ACTION

108-C-127 EARLIEST DATE TO BEGIN WORK

[CONTINUED]

Motion: Mr. Novak Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: YES	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 108 begin pg. 83. Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: TBD	___ 2024 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: X Revise RSP (No. 108-C-127) Effective: September 1, 2022 RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: There is confusion with guardrail and components and what items need to be from a manufacturer on the QPL and what items are covered by certification

PROPOSED SOLUTION: Incorporate the proposed edits to clarify the items that need to be furnished from a manufacturer on the QPL and what items are covered by a type C certification.

APPLICABLE STANDARD SPECIFICATIONS: 601 & 910

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 601

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Nathan Butts, Dave Jacobs, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: All contracts with a 601 pay item.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 2/22/2022

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Approved Materials List? A clarifying statement will be added to the QPL.
Will this proposal improve:

Construction costs? N/A
Construction time? N/A
Customer satisfaction? Yes
Congestion/travel time? N/A
Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A
For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes
Asset preservation? N/A
Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No
AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISIONS TO STANDARD SPECIFICATIONS

SECTION 601 - GUARDRAIL
601.02 Materials
SECTION 910 – METAL MATERIALS
910.10 Guardrail Posts
910.11 Guardrail Accessories, Fittings, and Hardware

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 601, BEGIN LINE 12, DELETE AND INSERT AS FOLLOWS:

601.02 Materials

Materials shall be in accordance with the following:

Alternate Material Blockouts	926.03
Guardrail Posts	910.10
Rail Accessories, Fittings, and Hardware	910.11
Steel Thrie-Beam Rail	910.09
Steel W-Beam Rail	910.09
Timber Posts and Blockouts	911.02(f)

All guardrail~~, post, accessories, fittings,~~ and *connection* hardware shall be supplied from a manufacturer listed on the QPL of Guardrail Manufacturers in accordance with 910.09. Guardrail end treatments shall be selected from the QPL of Guardrail End Treatments in accordance with 601.07 and impact attenuators shall be selected from the QPL of Impact Attenuators in accordance with 601.08.

SECTION 910, BEGIN LINE 591, DELETE AND INSERT AS FOLLOWS:

910.10 Guardrail Posts

Guardrail posts shall be either steel or timber as specified and shall be in accordance with the following requirements. *A type C certification in accordance with 916 shall be provided for the guardrail posts.*

(a) Steel Guardrail Posts

The dimensions of the steel guardrail posts shall be as shown on the plans. The material shall be in accordance with ASTM A36. The posts shall be galvanized in accordance with ASTM A123 after fabrication. However, the weight of zinc coating per square foot of actual surface shall not average less than 2.0 oz for an individual post.

The weight of the W6 x 15 post, after fabrication and coating, shall not be less than 14.60 or more than 16.00 lb/ft.

Construction details shall be as shown on the plans. Whenever field fabrication, as approved, requires cutting or drilling, the cut or drilled member shall be coated with a high zinc dust-zinc oxide paint conforming to the requirements of Federal Specification TT-P-641, or Military Specifications DOD-P-21035. When spray paints are used, two coats shall be applied.

REVISIONS TO STANDARD SPECIFICATIONS

SECTION 601 - GUARDRAIL
601.02 Materials
SECTION 910 – METAL MATERIALS
910.10 Guardrail Posts
910.11 Guardrail Accessories, Fittings, and Hardware

(b) Timber Guardrail Posts

Timber guardrail posts shall be in accordance with 911.02(f). Dimensions and construction details shall be as shown on the plans.

910.11 Guardrail Accessories, Fittings, and Hardware

These items consist of brackets, splice plates and bars, post anchors, diaphragms, clamps and clamp bars, end caps, connections ~~s~~ *hardware*, anchor rod assemblies, deadmen, ~~bolts, screws, nuts, washers~~ and blockouts of the type, dimensions, and design shown on the plans. They shall be in accordance with the requirements set out below. Items of the same type shall be interchangeable regardless of the source. *Connection hardware consisting of bolts, nuts, washers, and splice plates will only be accepted from qualified manufacturers on the QPL of Guardrail Manufacturers. A type C certification in accordance with 916 shall be provided for all other accessories and fittings.*

COMMENTS AND ACTION

601.02 Materials
910.10 Guardrail Posts
910.11 Guardrail Accessories, Fittings, and Hardware

DISCUSSION:
This item was introduced and presented by Mr. Reilman who explained that there is confusion with guardrail and components and what items need to be from a manufacturer on the QPL and what items are covered by certification.

Mr. Reilman proposed to incorporate the proposed edits to clarify the items that need to be furnished from a manufacturer on the QPL and what items are covered by a type C certification.

Prior to the meeting:

Mr. Duncan, FHWA, mentioned that it looks like you are moving guardrail posts from being furnished from a manufacturer on the QPL to being covered by a type C certification, why?

Mr. Reilman responded that is correct, by requiring them to be furnished from a manufacturer on the QPL, we believe we are reducing competition and thus unnecessarily driving up prices by only having a few suppliers, those on the QPL. These are commonly available items, a W6x9 steel shape, that is used for many things, not just guardrail posts. Several companies manufacture these shapes. Since it is a commonly available shape, wouldn't it be better to allow anyone who can produce it domestically meeting the ASTM A36 specifications provide this material, and thus accept it on certification? Mr. Reilman also responded to Mr. Duncan's question that yes, we will be asking for the manufacturer items on the QPL for the hardware/connections for the guardrail, but not the posts.

Mr. Duncan also asked if having posts accepted by a type C certification common, acceptable, how are posts accepted now, and is this just a clarification? Mr. Reilman stated that the posts are provided by a supplier on the QPL, and that this is fixing an inconsistency between the specification and Frequency Manual and hopefully will increase the number of suppliers of posts.

There was no further discussion and this item passed as submitted.

COMMENTS AND ACTION

601.02 Materials
910.10 Guardrail Posts
910.11 Guardrail Accessories, Fittings, and Hardware

[CONTINUED]

Motion: Mr. Reilman Second: Mr. Novak Ayes: 9 Nays: 0 FHWA Approval: YES	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 601 begin pg. 487. 910 begin pg. 1059. Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	X 2024 Standard Specifications ___ Revise Pay Items List X Create RSP (No. 601-R-750) Effective: September 1, 2022 RSP Sunset Date: 2024 SS book ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The materials section is shown in 738.02 and should be in the 900 section. This can cause confusion for folks accustomed to looking for material requirements in the 900 section.

PROPOSED SOLUTION: Incorporate editorial-type changes to RSP 738-B-297 to move the material requirements from the 738.02 section into the 900 section and other minor edits.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: revise existing RSP 738-B-297

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Mike Nelson, Christa Phelps, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: same as currently exists for this RSP

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 2/22/2022

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Approved Materials List? N/A
Will this proposal improve:

- Construction costs? N/A
- Construction time? N/A
- Customer satisfaction? N/A
- Congestion/travel time? N/A
- Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

- For motorists? N/A
- For construction workers? N/A

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? N/A
- Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

- Federal or State regulations? No
- AASHTO or other design code? No

Is this item editorial? Yes

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO SPECIAL PROVISIONS

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

(Note: Proposed changes shown highlighted gray)

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

(Revised 12-17-21)

The Standard Specifications are revised as follows:

SECTION 737, AFTER LINE 154, INSERT AS FOLLOWS:

SECTION 738 – WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR OTHER CONCRETE SURFACES

738.01 Description

This work shall consist of cleaning and preparing a bridge deck surface and other, non-bridge deck surfaces, furnishing and mixing materials, and applying a two-coat polymer overlay system in accordance with 105.03.

The Contractor shall provide a performance warranty for the two-coat polymer overlay system in accordance with 738.13 when the polymer overlay system is applied to the surface of a bridge deck. A performance warranty will not be required for two-coat polymer overlay systems applied to an RCBA or other concrete surface, other than a bridge deck.

MATERIALS

738.02 Materials

Materials shall be in accordance with the following:

Fine Aggregates 904.02
Polymer for Polymer Overlay Systems 909.13
Rapid Setting Patch Materials 901.07

~~(a) Patching Materials~~

~~Materials for partial depth patching shall be one of the following:~~

~~1. Rapid setting patch materials shall be used for patching areas that are 2 1/2 in. or deeper as measured from the prepared concrete surface. The rapid setting patch material selected shall have written approval from the manufacturer that there are no compatibility issues between the polymer overlay system materials and the rapid setting patch materials.~~

~~*2. If the patch depth is less than 2 1/2 in. from the prepared concrete surface either the polymer material or rapid setting patch materials may be used for patching.*~~

~~***(b) Polymer***~~

~~*The polymer used in the polymer overlay system shall be from the Department's QPL of Polymers and Aggregates for Overlay Systems. The Contractor shall provide technical literature with instructions on storing, mixing, and applying the polymer, and cleaning up and disposing of excess materials. The polymer shall be stored according to the manufacturer's recommendations.*~~

~~***(c) Aggregate***~~

~~*The aggregate for all layers of the polymer overlay system shall be selected from the Department's QPL of Polymers and Aggregates for Overlay Systems and shall be one of the following.*~~

~~*1. Aluminum oxide*~~
~~*2. Basalt*~~
~~*3. Calcined bauxite*~~
~~*4. Crushed granite*~~
~~*5. Flint*~~
~~*6. Glacial gravel*~~

~~*The aggregate shall be in accordance with 904.02 and have a minimum fine aggregate angularity value of at least 45 and a maximum micro-deval of 11.0 in accordance with ASTM D7428. 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 waterproof bags or containers.*

~~***1. Basalt Aggregate Gradation***~~

~~*Basalt aggregate gradation shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:*~~

~~*Sieve Size*~~	~~*% Passing by Weight*~~
~~*No. 4 (4.75 mm)*~~	~~*100*~~
~~*No. 8 (2.36 mm)*~~	~~*30 to 75*~~
~~*No. 16 (1.18 mm)*~~	~~*1 to 5*~~
~~*No. 30 (600 µm)*~~	~~*0 to 1*~~

~~***2. Gradation of Other Aggregates***~~

~~*Aluminum oxide, calcined bauxite, crushed granite, flint, or glacial gravel shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:*~~

~~*Sieve Size*~~	~~*% Passing by Weight*~~
~~*No. 4 (4.75 mm)*~~	~~*95 to 100*~~
~~*No. 6 (3.35 mm)*~~	~~*70 to 85*~~
~~*No. 10 (2 mm)*~~	~~*15 to 35*~~
~~*No. 20 (850 µm)*~~	~~*0 to 3*~~

CONSTRUCTION REQUIREMENTS

738.03 Quality Control

Prior to beginning work, the Contractor shall prepare a QCP detailing the construction of the polymer overlay system. The QCP shall be approved by the manufacturer of the polymer materials and be documented with the manufacturer's signature on the QCP approval page. Any deviations from the application prescribed by this specification shall be explained in the QCP. Once the QCP has been approved by the manufacturer, it shall be submitted to the Engineer.

The QCP shall include:

(a) a current copy of ISO 8502-3, Tests for the Assessment of Surface Cleanliness,

(b) all materials proposed to be used including product data sheets,

(c) all equipment proposed to be used,

(d) all verification testing equipment to be used,

(e) application procedures,

(f) minimum and maximum air and deck surface temperatures for which work will occur,

(g) proposed schedule for, and means of, traffic control,

(h) methods to be used for patching and crack repair,

(i) methods to be used for surface preparation and application of the polymer overlay system,

(j) any other information the Contractor believes relevant and will help the Engineer in their review of the submitted QCP.

No work shall begin until the Engineer has signed the QCP.

738.04 Equipment

Equipment shall be in accordance with the following.

(a) Concrete Surface Preparation Equipment

~~The c~~Concrete surface preparation shall consist of shot-blasting equipment that can remove the existing surface texture and generate the required surface macrotexture in accordance with 738.~~0~~605. The shot-blasting equipment shall be equipped with oil and moisture traps. On a bridge deck, the concrete surface shall be removed up to the vertical face of bridge railings or barriers and to the edge of transverse bridge joints. If the equipment specified in this section for surface preparation is not capable of removing the concrete surface in these areas, hand tools or other equipment may be proposed for use by the Contractor.

For shot blasting, the blasting medium shall be steel shot. No substitutions will be allowed.

The residue generated by the surface preparation shall be contained, removed, and disposed of in accordance with 202.

(b) Air Compressor

When compressed air is specified for use~~d~~, it shall be free from oil and moisture contamination in accordance with ASTM D4285. Cleanliness of the compressed air shall be verified by using either an absorbent or non-absorbent white collector material positioned a maximum of 24 in. from the air discharge point, centered in the compressed air stream. Compressed air shall discharge onto the collector material a minimum of 1 minute. The Contractor and Engineer shall jointly visually examine the collector material for the presence of oil or water. The Engineer will be the final authority in case of disagreement on the presence of oil or water. Verification of the cleanliness of the compressed air shall be performed a minimum of one time per shift for each air compressor in operation. If contamination is observed on the collector material, that air compressor shall not be used until necessary repairs are made to the unit so clean, dry air is achieved~~. If contamination is observed on the collector material, and. If contamination is observed on the collector material, ~~all work performed since the previous cleanliness verification shall be examined to determine if the work area has been contaminated. If contaminated, the affected work area shall be re-shot blasted to remove the contamination.

(c) Polymer Mixing and Distribution Equipment

Polymer mixing and distributing equipment shall, at a minimum, consist of a truck-mounted, temperature-controlled polymer mixing and distribution system capable of accurately blending the resin and hardening components of the polymer system. The mixing and distributing system shall include thermostat heating element-controlled mixing capability. Each component of the polymer shall be supplied by a pump. Wheelbarrows ~~will~~shall not be ~~accepted~~used as a polymer mixing and distribution system.

The amount of the resin and hardener components shall be continuously and independently measured with flow meters prior to mixing. Mixing shall be in-line and produce a continuous stream of mixed polymer at the manufacturer's required proportioning prior to exiting the dispensing nozzle. The mixing equipment may be either a truck mounted mechanical mixer or the material may be mixed by a static mixer contained in the wand applicator.

1. Hand Applications

Notched squeegees with 3/16 in. deep notches and 1/2 in. nap rollers shall be used to distribute the mixed polymer.

2. Mechanical Applications

The mixing equipment and distribution system shall automatically and accurately proportion the components in accordance with the manufacturer's recommendations, mix, and continuously apply the mixed polymer uniformly and accurately to the work area at the specified rate.

(d) Aggregate Distribution Equipment

The aggregate distribution system shall consist of a truck-mounted air-blown pneumatic spreader using oil-free compressed air in accordance with 738.04(b). The spreader shall apply the aggregate to the surface in a uniform manner. Chip spreaders, salt spreaders, or other rotary-type spreaders shall not be used.

738.05 Preparation of Concrete Surfaces

The top 1/4 in. of the concrete surface shall be removed with equipment in accordance with 738.04(a). Compressed air used for shot blasting activities shall be in accordance with 738.04(b). After ~~this~~the concrete surface material has been removed, all remaining residue from the operation shall be gathered up with a vacuum system equipped with fugitive dust control devices that can remove all dust and other material not securely bonded to the concrete surface, and discarded. The Contractor shall then sound the entire concrete surface and mark any areas to be repaired. All existing partial depth patches, delaminated areas, spalls, and breakouts shall be removed and repaired by partial depth patching in accordance with 722.07, except that the patching materials used shall be in accordance with ~~738.02(a)~~the following~~.~~:

a. Rapid setting patch materials shall be used for patching areas that are 2 1/2 in. or deeper as measured from the prepared concrete surface. The rapid setting patch material selected shall have written approval from the manufacturer that there are no compatibility issues between the polymer overlay system materials and the rapid setting patch materials.

b. If the patch depth is less than 2 1/2 in. from the prepared concrete surface either the polymer material or rapid setting patch materials may be used for patching.

Patches shall be cured for the longer of the minimum times required by either the manufacturer of the rapid setting patch material or the manufacturer of the polymer materials, prior to performing any surface preparation activities or installing a polymer overlay system.

Type I-A joints shall be cleaned, and all existing joint sealing material shall be completely removed. If the repair is 2 1/2 in. or deeper as measured from the prepared concrete surface, rapid setting patch materials shall be used and allowed to fully cure prior to applying the polymer overlay system. If the depth of repair is less than 2 1/2 in., the repair may be made at the time of the polymer overlay system installation using the polymer material proportioned according to the manufacturer's instructions.

Once all deleterious material has been removed and areas 2 1/2 in. and deeper have been patched, the Engineer will sound the entire concrete surface. When the Engineer is satisfied that all deleterious material has been removed and patches are sound, the Contractor ~~may~~shall proceed with shot blasting ~~the entire concrete surface~~all patched areas with steel shot using equipment in accordance with 738.04(a) until a concrete surface profile, CSP, 7, in accordance with this section, has been achieved~~the entire concrete surface with steel shot~~. Sand blasting shall not be used in place of shot blasting.

The concrete surface shall be cleaned with a vacuum system equipped with fugitive dust control devices that is capable of removing all dust and all other material not securely bonded to the concrete surface. Mechanical brooms, without water or vacuuming, shall be used to remove any residual dust or material that adheres to the prepared concrete surface after it has been vacuumed. After brooming is performed, the concrete surface shall be vacuumed again to remove the last remaining residual dust and loose material. The ~~resulting~~entire concrete surface shall be completely 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 polymer overlay system. Traffic marking materials within the application area shall be removed. ~~Compressed air in accordance with 738.04(b) 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 concrete~~

~~*surface after it has been blown off with compressed air. The prepared concrete 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 activities shall be in accordance with 738.04(b).*~~ *The cleaned, prepared concrete surface shall meet the International Concrete Repair Institute, ICRI, Guideline 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair,* ~~*concrete surface profile,*~~ *CSP, 7. The Contractor shall provide a set of the CSP chips for the Engineer's use on the project. The CSP chip set shall remain the property of the Contractor.*

Pretreatment for cracks ~~*per*~~*in accordance with the manufacturer's recommendation shall be incorporated into the installation of the polymer overlay system. The material used in the pretreatment of cracks shall be in accordance with the manufacturer's recommendations and specifications.*

738.06 Surface Cleanliness Verification Testing

After the final surface preparation has been completed and immediately before application of the polymer overlay system, the cleanliness of the prepared concrete surface shall be verified by testing in accordance with ISO 8502-3. The testing criteria will be as follows:

Sample Size	*Frequency*	*Minimum Requirements (Class size)*
Each bridge span or concrete surface less than 600 sq yd in area	*1 test patch per 100 sq yd area*	*Average of tests not more than class 2 with no single test patch greater than class 3.*
Each bridge span or concrete surface 600 sq yd and greater in area	*6 per 600 sq yd area*	*Average of tests not more than class 2 with no single test patch greater than class 3.*

Testing shall be performed in the presence of the Engineer and a copy of ISO 8502-3 shall be provided to the Engineer so the Engineer may determine the class. If the surface cleanliness verification test results in an average class greater than that shown in the table above, the entire concrete surface shall be cleaned again with ~~*either*~~ *a vacuum* ~~*truck or compressed air*~~*system or mechanical broom and vacuum system in accordance with 738.*~~*04(b)*~~*05 and retested until the concrete surface is clean enough to yield an average class result in accordance with the requirements shown in the table above.*

738.07 Applying the Polymer Overlay System

Patching and cleaning operations shall be inspected and approved prior to applying each layer of the polymer overlay system. Any contamination of the concrete

surface or intermediate polymer overlay system courses, after initial cleaning, shall be removed. Both courses of the polymer overlay system shall be applied within 24 hours following the final cleaning and prior to opening the area to traffic.

(a) Environmental Condition Requirements

1. Surface Moisture

A~~n electronic moisture~~ self-calibrating electrical impedance meter meeting the requirements of ASTM F2659 shall be used to check surface moisture on the concrete surface. The brand and model of the meter as well as manufacturer specification sheets showing compliance with ASTM F2659 shall be included in the QCP.

Immediately prior to beginning application of the polymer overlay system, surface moisture readings shall be taken at six locations per bridge span. Three locations shall be within 1 ft of the bridge railing on the low side of the cross slope spaced throughout the span and the other three shall be located within a lane between the typical wheel paths in the span. If the polymer overlay system is being applied to the RCBA or another concrete surface, four surface moisture readings shall be taken on each RCBA or other concrete surface. Two locations shall be within 1 ft of the outside edge of the RCBA or other concrete surface and the other two shall be located within a lane between the typical wheel paths in the span. The meter shall be calibrated before taking any readings at the first location. Thereafter, the meter shall again be calibrated before taking any readings at a new location on the bridge or RCBA. All readings shall be 4.0% moisture content or lower in order to begin application of the polymer overlay system. No visible moisture shall be present on the prepared concrete surface or patch material at the time of application of the polymer overlay system. Compressed air in accordance with 738.04(b) may be used to dry the concrete surface.

2. Weather Limitations

Polymer overlay materials shall be applied when the temperature of the concrete surface is between 50°F and 100°F and the ambient temperature is forecast to be 50°F and rising within 8 h of application. Materials shall not be applied on a wet surface ~~or~~ when surface moisture readings taken on the deck exceed 4.0%, or when rain is forecast within 12 h of beginning the application.

(b) Application Verification Rate Requirements

The Contractor shall verify the volume of polymer overlay being applied by performing volume measurements at 25 ft intervals as measured along the longitudinal length of the concrete surface. This shall be done by marking the resin and hardener component tote levels in permanent marker concurrent with the completion of a 25 ft longitudinal length section of concrete surface. Marking of the resin and hardener component tote levels shall continue every 25 ft of completed concrete surface length as work progresses. Volume of each 25 ft section shall then be calculated and logged based upon the height between marks and the actual tote length and width. Actual volume applied

for each 25 ft section shall be logged per course of polymer overlay. The actual volume shall be divided by the actual area of coverage, ~~(~~25 ft x width~~,)~~ in order to verify quantity applied meets or exceeds the minimum rates shown in the table below. Volumes utilized and calculations shall be logged by the Contractor with station information for each section and provided to the Engineer.

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*
** Aggregate application shall be of sufficient quantity to completely cover the polymer.*		

(c) Mixing, Application, and Curing

The polymer course and the aggregate course shall be applied in two separate operations in accordance with the following rates of application.

1. Polymer

Both the resin and hardener components of the polymer shall have a temperature of 75°F or higher at the time of mixing and application. Handling and mixing of the polymer resin and hardening components 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. Polymer overlay systems shall not be applied when weather or surface conditions are such that the material cannot be properly handled, applied, spread, and cured within the specified requirements or cure time and traffic control.

After the polymer mixture has been prepared, it shall be immediately and uniformly applied to the entire concrete surface using one of the following application methods. The rate of application for each course shall be verified by using the application verification rate requirement in accordance with 738.07(b). The distribution system, or distributor, shall apply the mixed polymer uniformly and accurately to the work area at the specified rate. The viscosity of the polymer shall be such that a uniform thickness is maintained during curing and ponding along the railing or other low points does not occur.

a. Hand Application

Notched squeegees and rollers in accordance with 738.04(c)1 shall be used to control and ensure the application of a uniform thickness of the polymer overlay. Flat squeegees shall not be used.

b. Mechanical Application

Placement of the polymer overlay system using mechanical means shall be performed by equipment in accordance with 738.04(c)2. The operation shall proceed in such a manner that does not allow the mixed polymer to segregate, dry, be exposed, or

otherwise harden or set in a way as to impair the retention and bonding of broadcasted aggregate.

2. Aggregate

Dry aggregate shall be applied immediately after applying the polymer to the prepared surface. The aggregate shall be applied in such a manner as to cover the entire surface in excess within 5 minutes of polymer placement.

3. Curing

The Contractor shall plan and prosecute the work to provide the following minimum curing periods, or other longer minimum curing periods if prescribed by the manufacturer.

The deck temperature shall be taken immediately prior to placing the polymer overlay system. This deck temperature reading shall be the one used in the curing table below to obtain the required minimum curing time. The polymer overlay system shall be cured in accordance with the curing table below and based on the manufacturer's requirements prior to vacuuming and brooming the finished surface.

The minimum curing periods shall be as follows:

Course	*Minimum Cure Time by Deck Temperature, °F*							
	50 - 54	*55 - 59*	*60 - 64*	*65 - 69*	*70 - 74*	*75 - 79*	*80 - 84*	*≥ 85*
1	*7 1/2 h*	*5 1/2 h*	*4 h*	*3 h*	*2 1/2 h*	*2 h*	*1 1/2 h*	*1 h*
2	*11 h*	*8 1/2 h*	*6 1/2 h*	*5 h*	*4 h*	*3 h*	*3 h*	*3 h*

Traffic or equipment shall not be allowed on the polymer overlay system surface during the curing period. The Contractor shall minimize all foot traffic on the uncured polymer overlay system and ensure that any foot traffic will only be done with steel spiked shoes approved by the Engineer. After the first course curing period, all loose aggregate shall be removed by vacuuming or brooming, without tearing or damaging the surface. Then the next course of polymer shall be applied to completion. All loose aggregate from both the first and second courses shall be discarded and not reused in the polymer overlay system.

A surface having received only the first course application of aggregate shall not be opened to traffic.

738.08 Joints and Raised Pavement Markers

Unless otherwise specified by the Engineer, the polymer overlay system shall not be applied over expansion joints or raised pavement markers. Expansion joints and raised pavement markers shall be coated with a bond breaker or covered using an approved tape that can adequately seal the joints and markers from the polymer. Duct tape may be used

to delineate application areas. All taped areas or bond breakers shall be removed before the polymer fully cures.

The Type I-A joint gap shall be reestablished by saw cutting and sealed in accordance with 609.05 after both courses of the polymer overlay system have been applied and cured.

In the event saw cutting for the type I-A joint damages or mars the top surface of the polymer overlay system, damaged areas shall be removed by saw cutting in rectangular sections to the top of the deck surface and reapplying the polymer overlay system courses in accordance with this specification.

738.09 Required Records

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

1. *Batch numbers and sizes;*
2. *Location of batches as applied to the concrete surface, referenced by stations;*
3. *The calculated rate of application for each 25 ft length of concrete surface for each course;*
4. *Batch time, gel time;*
5. *Temperature of the air, concrete surface, polymer resin and hardener components, and aggregates;*
6. *Loose aggregate removal time, and;*
7. *Time opened to traffic.*

738.10 Opening to Traffic

The polymer overlay system may be opened to traffic after meeting all cure time requirements for both courses in accordance with 738.07(c)3 and all other manufacturer's requirements.

738.11 Temporary and Permanent Pavement Markings

Temporary tape pavement marking, type I, used on portions of the completed polymer overlay system shall be installed per the manufacturer's recommendations and shall be firmly pressed into place to provide adequate bond to the exposed aggregate surface.

Retro-reflectivity testing will not be required on concrete surfaces where a polymeric overlay system has been applied.

Heat-bonded pavement markings or temporary paint pavement markings shall not be used on any portions of the polymer overlay system.

738.12 Final Clean Up

If directed by the Engineer, at the end of the project or a minimum of 7 days after the polymer overlay system has fully cured, all loose aggregate that has shed shall be removed by vacuuming or brooming and not re-used. In addition, if the visibility of the recently applied pavement markings has been reduced due to adherence to loose aggregate, they shall be reapplied.

738.13 Performance Warranty

(a) General

The Contractor shall be responsible for and guarantee the performance of the polymer overlay system that has been applied to the bridge deck surface, as defined herein, for a period of three years after the initial acceptance date defined in 738.13(b)4. The Contractor shall warrant to the Department that the warranted work will be free of defects as measured by the condition parameters in 738.14(c)1 and not exceed the specified threshold values for each.

The performance warranty requirements for the polymer overlay system will not apply to an RCBA or other surfaces outside of the limits of the bridge deck surface.

The performance warranty and its provisions shall not be construed as extending or otherwise affecting the claim process and statute of limitations otherwise applicable to this contract.

(b) Definitions

The following definitions shall apply.

1. *Bridge Deck Surface. The surface area contained within the out-to-out of coping width dimension and end-to-end of bridge floor length dimension. Items with raised vertical faces such as but not limited to bridge railings, sidewalks, curbs, median curbs, and barriers will not be considered part of the bridge deck surface for purposes of this specification.*

2. *Conflict Resolution Team, CRT. A group consisting of five individuals whose sole responsibility is to provide a decision on disputes between the Department and the Contractor regarding application or fulfillment of the warranty requirements. The CRT is described in more detail in 738.15.*

3. *Delamination. Debonding of the polymer overlay system from the existing bridge deck surface.*

4. *Initial Acceptance Date. The same date as the date of the final acceptance of the contract. This date will be considered the start of the warranty period.*

5. *Scaling. Worn polymer overlay system surface with loss of epoxy and aggregate resulting in a reduction in thickness of the polymer overlay system greater than 20% of the initial overlay thickness.*

6. *Spalling. Broken or missing pieces of the polymer overlay system.*

7. *Warranted Work. The work product, polymer overlay system, that is guaranteed not to fall outside the specified thresholds of the condition parameters as defined in 738.14(c)1 during the warranty period.*

8. *Warranty Period. The three year period of time the Contractor is required to ensure the performance of the polymer overlay system meets or exceeds the minimum specified threshold condition parameters as defined in 738.14(c)1.*

9. *Warranty Work. Corrective actions or remedial actions performed by the Contractor during the warranty period to bring the warranted work back into compliance with the specifications. All costs of warranty work shall be borne by the Contractor including traffic control, mobilization/demobilization, materials, pavement markings, and other incidental work and items. For purposes of this specification, the terms warranty work, corrective action, and remedial action are all interchangeable and shall have the same meaning.*

738.14 Warranted Conditions and Warranty Work

The warranty period shall start upon final acceptance of the contract.

(a) Warranted Elements

For the warranty period, the Contractor shall ensure that the polymer overlay system that is applied to the bridge deck surface performs as intended and none of the thresholds for condition parameters in 738.14(c)1 are exceeded at any time during the warranty period.

(b) Evaluation Method

The Department will monitor and conduct polymer overlay system evaluations for each bridge deck surface throughout the warranty period by means of the Indiana Bridge Inspection Application System in accordance with the National Bridge Inspection

Standards. Evaluations will consist of regular field condition reviews conducted by Department personnel. The Department will be responsible for notifying the Contractor, in writing, of any condition parameters that exceed threshold limits defined herein. The Department reserves the right to conduct impromptu inspections to evaluate the performance of the warranted polymer overlay system. The Contractor shall not be relieved of any responsibility based upon a claim that the Department failed to adequately monitor the structure or to report its findings to the Contractor.

(c) Warranty Work

Warranty work will be required when a threshold limit for a condition parameter identified in the Thresholds for Condition Parameters Table in 738.14(c)1 has been exceeded. All warranty work shall be in accordance with the 738 specifications.

During the warranty period, warranty work shall be performed at no cost to the Department and shall be based on evaluations of the condition parameters in 738.14(c)1. Upon written notification from the Department that warranty work is required, the Contractor shall submit a written course of action for performing needed warranty work for approval a minimum of 10 days prior to the desired start date. If the Contractor disputes the findings, written notification of the dispute shall be provided within 30 days of the date of the notification from the Department. Warranty work shall be performed no later than October 1 of the year of Department notification. Warranty work to be performed and materials to be used will be the joint decision of the Department and Contractor.

The Department will review the Contractor's proposal for time, methods, and traffic control to perform warranty work. No warranty work shall proceed until the Contractor has been issued written permission to proceed from the Engineer. The Department will be the sole decider whether warranty work performed by the Contractor meets the contract specifications. If warranty work performed by the Contractor necessitates repair of adjacent lanes or roadway shoulders, or reapplication of pavement markings, the required work and corresponding costs shall be the responsibility of the Contractor.

Coring, milling, grinding, or other destructive procedures shall not be performed by the Contractor without prior written approval of the Department. If the Contractor elects to conduct any independent testing, both destructive and non-destructive, the equipment shall be calibrated and correlated with the Department's equipment.

The Contractor will not be responsible for damages to the pavement as a result of coring, milling, grinding, or other destructive procedures conducted by the Department.

During the warranty period, the Contractor will not be held responsible for polymer overlay system distresses including but not limited to chemical and fuel spills, vehicle fires, structural repairs requiring deck patching, removal or replacement, and

quality assurance testing such as coring. However, the Contractor shall be responsible for wear or damage by snowplow blades and other winter maintenance operations.

Other factors considered to be beyond the control of the Contractor which may contribute to polymer overlay system distress will be considered by the Engineer on a case-by-case basis upon receipt of a written request from the Contractor.

1. Condition Parameters

Condition parameters identified in the table below will be used to determine the performance of the polymer overlay system during the warranty period. Each condition parameter has a threshold limit applied to each structure and a maximum percentage of defects allowed before warranty work or corrective action is required.

If one or more of the following threshold limits for condition parameters listed in the table below is exceeded, warranty work will be required and shall be performed. Warranty work shall be performed prior to conclusion of the warranty period or within such other time frame as agreed to between the Department and the Contractor unless conditions dictate otherwise.

Thresholds for Condition Parameters

Condition Parameter	*Threshold Limits Per Surface Area for Each Structure**
Spalling	*0.5%*
Scaling	*1.0%*
Delamination	*1.0%*
** once exceeded, warranty work shall be performed*	

The defective areas of the polymer overlay system may or may not be contiguous to necessitate warranty work. The Contractor shall ensure any warranty work requiring removal or replacement is made at a sufficient depth to restore the integrity of the polymer overlay system surface.

2. Corrective Actions

The Contractor shall perform the work necessary to repair all deficiencies associated with the warranted condition parameters. The Department will accept the listed corrective action if the action addresses the cause of the condition parameter as listed in the Thresholds for Condition Parameters Table in 738.14(c)1. The Contractor may use an alternative corrective action subject to Department approval.

Corrective Actions

Condition Parameter	*Recommended Corrective Action*

Spalling	*Repair with polymer overlay system of equal thickness and durability as the original overlay.*
Scaling	
Delamination	*Sound overlay to determine extent of delamination. Remove damaged polymer overlay, and repair with polymer overlay system of equal thickness and durability as the original polymer overlay system.*

738.15 Conflict Resolution Team

If a dispute arises on the application or fulfillment of the terms of this performance warranty, either party may serve written notice that the appointment of a CRT is necessary.

The CRT will consist of five members:

(a) Two members selected and fully compensated by the Department,

(b) Two members selected and fully compensated by the Contractor, and

(c) One member mutually selected by the Department and the Contractor. Full compensation for the third-party member will be equally shared by the Department and the Contractor.

The CRT members will be identified in writing when needed and will be knowledgeable in the terms and conditions of this performance warranty, specification, and the methods used in evaluating the overlay condition. The CRT will render a final recommendation to the Chief Engineer by a majority vote. Each member has an equal vote.

738.16 Department Maintenance

The Department will retain the right to perform, and may perform, routine maintenance operations during the warranty period including, but not limited to, plowing, applying de-icing chemicals, repairs to safety appurtenances, pavement markings, mowing, and sign maintenance. The Department, during the warranty period, will perform no routine bridge surface maintenance activities.

Routine maintenance performed by the Department will not diminish the Contractor's responsibilities under this warranty.

738.17 Method of Measurement

The accepted quantities of the warranted polymer overlay system for bridge decks will be measured by the square yard. The accepted quantities of the polymer overlay system applied to an RCBA or other concrete surfaces will be measured by the square yard.

Partial depth patching will be measured by the square foot. Pavement markings, temporary and permanent, will be measured in accordance with 801.17 and 808.12, respectively.

Rapid setting patch materials used for patching concrete for partial depth patching will not be measured. Polymer material used for partial depth patching will not be measured. Construction or repairs to type I-A joints will not be measured.

738.18 Basis of Payment

Warranted polymer overlay systems for bridge decks will be paid for at the contract unit price for warranted polymer overlay, bridge deck. Polymer overlay systems applied to the RCBA or other concrete surfaces will be paid for at the contract unit price for polymer overlay, other concrete surface. Partial depth patching will be paid for at the contract unit price per square foot as bridge deck patching, partial depth, in accordance with 722.16. Pavement markings, temporary and permanent, will be paid for in accordance with 801.18 and 808.13, respectively.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Polymer Overlay, Other Concrete Surface	*SYS*
Warranted Polymer Overlay, Bridge Deck	*SYS*

The cost of hand-chipping, removal of unsound concrete, preparation of cavity surfaces, furnishing and applying bond coat or polymer resin adhesive as required, furnishing and placing rapid setting patch materials used as patching concrete, furnishing and placing polymer materials used for patching, and necessary incidentals shall be included in the cost of bridge deck patching, partial depth.

The cost of all re-cleaning of suspect areas or verification through tests that the altered cleaning method is acceptable shall be included in the cost of the pay items of this specification.

All costs of cleaning the concrete surface by shot blasting, mechanical brooming, vacuuming, sounding, verification testing and costs associated with verification testing, removal of any joint or crack sealants, removal of excess aggregate, warrantying the performance of the two-coat polymer overlay system on a bridge deck surface, keeping and furnishing records, 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 warranted polymer overlay, bridge deck or polymer overlay, other concrete surface pay items.

The cost of all labor and materials for the placement or repair of type I-A joints shall be included in the cost of the warranted polymer overlay,-bridge deck pay item.

The cost of returning a minimum of 7 days after work is completed and cleaning up loose aggregate and reapplying pavement markings shall be included in the cost of the pay items of this specification.

738.19 Final Warranty Acceptance

At the end of the warranty period, the Engineer will review the project in the field for the presence of any of the condition parameters in 738.14(c)1 and, provided none are observed, will recommend a Final Warranty Acceptance. The Department will issue the Contractor a Final Warranty Acceptance letter upon completion of the warranty period and all required remedial work.

SECTION 904, AFTER LINE 167, INSERT AS FOLLOWS:

(h) For Polymer Overlay System

Fine aggregate for all layers of the polymer overlay system shall be selected from the Department's QPL of Polymers and Aggregates for Overlay Systems and shall be comprised of one of the following.

1. *Aluminum oxide*
2. *Basalt*
3. *Calcined bauxite*
4. *Crushed granite*
5. *Flint*
6. *Glacial gravel*
7. *Rhyolite*

The aggregate shall also be in accordance with 904.02, shall be clean and dry, and free of dirt, clay, asphalt, and other foreign or organic materials, and shall comply with the following properties.

Physical Property	*Test Method*	*Requirement*
Fine Aggregate Angularity (min.)	*AASHTO T 304, Method A*	*45*
Micro-Deval, in. (max.)	*ASTM D7428*	*11.0*
Moisture content, % (max.)	*AASHTO T 255*	*0.2*

The aggregate gradation shall be as follows.

1. Basalt Aggregate Gradation

Basalt aggregate gradation shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:

Sieve Sizes	*% Passing by Weight*

No. 4 (4.75 mm)	*100*
No. 8 (2.36 mm)	*30 to 75*
No. 16 (1.18 mm)	*1 to 5*
No. 30 (600 µm)	*0 to 1*

2. Gradation of Other Aggregates

Aluminum oxide, calcined bauxite, crushed granite, flint, glacial gravel, or rhyolite shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:

Sieve Sizes	*% Passing by Weight*
No. 4 (4.75 mm)	*95 to 100*
No. 6 (3.35 mm)	*70 to 85*
No. 10 (2 mm)	*15 to 35*
No. 20 (850 µm)	*0 to 3*

(~~h~~i) Sizes of Fine Aggregates

SECTION 904, BEGIN LINE 171, INSERT AS FOLLOWS:

(~~i~~j) Sampling and Testing

Sampling and testing shall be conducted in accordance with the following AASHTO, *ASTMs,* and ITMs.

Acid Insoluble Content..... ITM 202
Amount of Material Finer than
No. 200 (75 µm) Sieve* ..... AASHTO T 11
Brine Freeze and Thaw Soundness ..... ITM 209
Control Procedures for Classification
of Aggregates..... ITM 203
Determining the Plastic Limit and
Plasticity Index of Soils..... AASHTO T 90
Mortar Strength..... AASHTO T 71
Organic Impurities ..... AASHTO T 21
Resistance of Fine Aggregate to
Abrasion/Micro-Deval..... ASTM D7428*
Sampling Aggregates ..... AASHTO T 2
Sampling Stockpiled Aggregates..... ITM 207
Sieve Analysis of Aggregate*..... AASHTO T 27
Sieve Analysis of Mineral Filler* ..... AASHTO T 37
Soundness* ..... AASHTO T 103,

..... AASHTO T 104
Specific Gravity and Absorption, Fine Aggregate..... AASHTO T 84
* Except as noted in 904.06.

SECTION 904, BEGIN LINE 359, INSERT AS FOLLOWS:

904.06 Exceptions to AASHTO *and ASTM* Standard Methods

(a) Exceptions to AASHTO T 2

Stockpile sampling shall be in accordance with ITM 207, unless otherwise approved.

(b) Exceptions to AASHTO T 11, T 27, and T 37

1. When tests are performed in the field where ovens are not available, test samples may be dried in suitable containers over open flame or electric hot plates with sufficient stirring to prevent overheating, then cooled to constant weight.

2. The balance shall be a Class G2 general purpose balance in accordance with AASHTO M 231.

(c) Exceptions to AASHTO T 27 for Coarse Aggregates

The size of test samples for coarse aggregate shall be as follows:

Aggregate Size	**Minimum Weight of Test Sample**
No. 2	25 lb
No 5, 8, 43, 53, 73, and 91	13 - 18 lb
No. 9	9 - 13 lb
Structure Backfill	
2 in. (50 mm)	25 lb
1 1/2 in. (37.5 mm) and 1 in. (25.0 mm)	13 - 18 lb
1/2 in. (12.5 mm)	9 - 13 lb
No. 4 (4.75 mm) and No. 30 (600 µm)	10 oz

(d) Exceptions to AASHTO T 85

The in-water weight shall be determined following the 15 h soaking period prior to determining the SSD weight.

(e) Exceptions to AASHTO T 103 and T 104

1. Counting the number of individual particles coarser than the 3/4 in. (19.0 mm) sieve will not be required.

2. For testing ledge rock, the ledge samples shall be crushed to obtain test samples for the designated increments passing the 1 1/2 in. (37.5 mm) sieve and retained on the No. 4 (4.75 mm) sieve. The factors used to calculate the weighted average loss are 30%, 40%, and 30% of the 1 1/2 in. (37.5 mm) - 3/4 in. (19.0 mm), 3/4 in. (19.0 mm) - 3/8 in. (9.5 mm), and 3/8 in. (9.5 mm) - No. 4 (4.75 mm) increments, respectively.

3. In the case of ledge rock, modify sections 3.3 and 6.2 of AASHTO T 103 and AASHTO T 104 respectively. When the sample received is deficient in material of a component size of any test portion, that material will be supplemented with the available component size to provide the test portion.

4. Modify section 8 of AASHTO T 103 and section 10 of AASHTO T 104. For materials designated as a coarse aggregate, the weighted loss will be calculated considering the material retained on the No. 4 (4.75 mm) sieve as 100% of the sample, and only the total weighted loss reported. In AASHTO T 104 sections 10.1.3.2 and 10.1.3.3 shall not apply, and unless otherwise noted only new solution will be used.

(f) Exceptions to ASTM D7428

Modify section 8.2 of ASTM D7428. Aggregate for the test sample will consist of material passing the 4.75 mm sieve and retained on the 1.18 mm sieve. An oven dried sample of 500 ± 5 g will be prepared as follows:

Passing	*Retained*	*Mass*
No. 4 (4.75 mm)	*No. 8 (2.36 mm)*	*250 g*
No. 8 (2.36 mm)	*No. 16 (1.18 mm)*	*250 g*

SECTION 909, AFTER LINE 407, INSERT AS FOLLOWS:

909.13 Polymer for Polymer Overlay Systems

The polymer used in the polymer overlay system shall be from the Department's QPL of Polymers and Aggregates for Overlay Systems. The Contractor shall provide technical literature with instructions on storing, mixing, and applying the polymer, and cleaning up and disposing of excess materials. The polymer shall be stored according to the manufacturer's recommendations.

The polymer shall be in accordance with the following criteria in order to be included on the Department's QPL for Polymers and Aggregates for Overlay Systems. The polymer shall be a two-component material consisting of a resin base and hardener in accordance with ASTM C881, Type III, Grade 1, Class C and the table below.

REVISION TO SPECIAL PROVISIONS

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

Property	*Test Method*	*Value*
Epoxide equivalent	*ASTM D1652*	*270 max.*
Gel Time, minutes	*ASTM C881, modified (70 ml sample in unwaxed paper cup)*	*15 to 45 at 75°F (23.9°C)*
Tensile strength	*ASTM D638*	*13.8 ~~Mpa~~ MPa (2,000 psi) at min. of 7 days of cure time*
Tensile elongation	*ASTM D638*	*30 to 70 % at max. of 24 h of cure time*
Water absorption	*ASTM D570*	*0.50 % max. increase by weight*
Viscosity	*ASTM D2196 (Spindle No. 3 at 20 RPM)*	*~~7 to 25~~15 ±5 poise~~s~~*
Compressive strength at 3 h, minimum	*ASTM C579 Method B, modified to be reported at 3 h*	*1,000 psi*
Compressive strength at 24 h, minimum	*ASTM C579 Method B, modified to be reported at 24 h (With plastic inserts. Aged in air at a temperature of 73 ±4˚F)*	*5,000 psi*
Volatile content	*ASTM D1259 Method B for mix system*	*Report the values*

COMMENTS AND ACTION

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

DISCUSSION:

Mr. Reilman introduced and presented this item stating that the materials section in RSP 738-B-297 is shown in 738.02 and should be in the 900 section. This can cause confusion for folks accustomed to looking for material requirements in the 900 section.

Mr. Reilman proposed to incorporate editorial-type changes to RSP 738-B-297 to move the material requirements from 738.02 into the 900 sections, in order to be consistent with the Standard Specifications format, along with other minor edits. Mr. Reilman stated that RSP 738-B-297 should not be incorporated into the 2024 SS, and that the 904 proposed changes shown in the 738-B-297 provision should remain in the 738 and not be added to RSP 904-M-059 because those changes are also specific to the polymer overlay work.

Further editorial revisions, per Mr. Reilman, are as shown. Mr. Reilman revised his motion.

There was no further discussion and this item passed as revised.

COMMENTS AND ACTION

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

[CONTINUED]

Motion: Mr. Reilman Second: Mr. White Ayes: 9 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 904 begin pg 994; 909 begin pg 1034. Recurring Special Provision references in: 738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: TBD	___ 2024 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.__) Effective: RSP Sunset Date: _X_ Revise RSP (No. 738-B-297) Effective: September 1, 2022 RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. __) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The standard drawing series for temporary traffic control devices (E 801-TCDV), lane closures (E 801-TCLC), shoulder closures (E 801-TCSC), and temporary closures (E 801-TCTS) need updating. Some of the series contain unnecessary sheets, duplicate sheets, or sheets that should be moved to another series. In addition, the E 801-TCDV series does not account for prevailing speeds on interstate merge tapers and the channelizing device usage table does not account for when drums reduce the effective lane width to 9 ft (e.g. full depth concrete patching on rural interstates). Also, there are still errors with designers calling for intermittent worksite speed limit assemblies when the continuous application is intended. The E 801-TCLC series does not currently address minor encroachment when channelizing devices are placed in traffic lanes (e.g. full depth concrete patching on rural interstates) and a double lane closure provides more protection to workers for work in the center lane than is possible with just a center lane closure.

PROPOSED SOLUTION: Revise and update the standard drawing series on temporary traffic control devices (E 801-TCDV), lane closures (E 801-TCLC), shoulder closures (E 801-TCSC), and temporary closures (E 801-TCTC). Create a RSP for the changes to the E 801-TCDV series and the basis of payment for continuous worksite speed limit assemblies and delete the standard drawing series for temporary shoulders (E 801-TCTS).

APPLICABLE STANDARD SPECIFICATIONS: 107.12, 801.08 and 801.18

APPLICABLE STANDARD DRAWINGS: 5 series [E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC, and E 801-TCTS].

Proposed New (3)	Proposed Deletions (8)	Proposed Moves (4)
801-TCLC-01 Lane Closures Index	801-TCLC-07 801-TCLC-13	801-TCLC-01 to 801-TCTC-03
801-TCSC-01 Shoulder Closures Index	801-TCLC-08 801-TCLC-16	801-TCLC-12 to 801-TCSC-04
801-TCTC-01 Temporary Closures Index	801-TCLC-10 801-TCLC-17	801-TCTC-11 to 801-TCCO-08
	801-TCLC-11 801-TCTS-01	801-TCTC-12 to 801-TCCO-09

APPLICABLE DESIGN MANUAL SECTION: 503-7.0

APPLICABLE SECTION OF GIFE: 2.8

APPLICABLE RECURRING SPECIAL PROVISIONS: No

PAY ITEMS AFFECTED: Yes, 801-01093, Temporary Worksite Speed Limit Sign Assembly

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

[continued]

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Yes, Traffic Standards Subcommittee

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: Required for all contracts with any **801** pay items.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Joe Bruno on behalf of Dave Boruff

Title: Sr. Traffic Engineer, Signals & Markings

Organization: INDOT

Phone Number: (317) 234-7949

Date: 2/21/2022

Mr. Boruff
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? Yes, 105.14
Will approval of this item affect the Approved Materials List? No
Will this proposal improve:

- Construction costs? No
- Construction time? Yes
- Customer satisfaction? Yes
- Congestion/travel time? Yes
- Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

- For motorists? Yes
- For construction workers? Yes

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? Yes
- Design process? Yes

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

- Federal or State regulations? No
- AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: N/A

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 107 – LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC
107.12 Traffic Control Devices
SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS
801.08 Cones and Tubular Markers
801.18 Basis of Payment

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 107, BEGIN LINE 438, DELETE AND INSERT AS FOLLOWS:

Pavements and shoulders having an edge drop of more than 3 in. shall be delineated with drums in accordance with 801.09. Delineation shall be at a maximum spacing of 200 ft. The use of cones in accordance with 801.08 will be allowed as shown on the plans except cones shall not be used for ~~interstate lane restrictions~~*shift or merge tapers on interstates and freeways and 42 in. cones may be used in tangent sections on interstates and freeways only when the use of drums would result in an effective lane width of less than 10 ft.*

SECTION 801, BEGIN LINE 294, DELETE AND INSERT AS FOLLOWS:

Cones shall be used only during temporary activities where portability is advantageous and they remain in place and do not create a hazard to traffic. The use of cones in lieu of drums will be allowed as shown on the plans except cones shall not be used for ~~interstate lane restrictions~~*shift or merge tapers on freeways and 42 in. cones may be used in tangent sections on interstates and freeways only when the use of drums would result in an effective lane width of less than 10 ft.*

Tubular markers shall be used for separating two-lane two-way traffic *on non-freeways* as shown on the plans or as directed. *Tubular markers may be used to delineate a pavement drop-off on non-freeways when the use of drums would result in an effective lane width of less than 10 ft.*

SECTION 801, BEGIN LINE 1039, DELETE AS FOLLOWS:

~~A temporary worksite speed limit sign assembly for continuous use includes two signs; each will be paid for at the contract unit price for construction sign.~~

SECTION 801, BEGIN LINE 1135, INSERT AS FOLLOWS:

Temporary Worksite Speed Limit Sign Assembly _____ ..... EACH
type

Click here to view E 801-T (with markups)
Also available at: https://www.in.gov/dot/div/contracts/standards/sc/

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

INDEX	
SHEET NO.	SUBJECT
1	Traffic Control Devices Index and General Notes
2	Channelizing Devices
3	Merge or Shift Taper
4	Channelizing Devices Usage Table
5	Type III Barricade
6	Typical Construction Sign Mounting
7	Type III Barricade Application for Road Closure for Thru Traffic
8	Type III Barricade Application for Road Closure to All Traffic
9	U Channel Steel Post Splice Detail
10	Temporary Transverse Rumble Strips
11	Worksite Speed Limit Sign Assembly
12	Worksite Speed Limit Sign Assembly Longitudinal Placement

GENERAL NOTES:

1. Unless otherwise noted, channelizing devices in tangent sections shall be 100 ft where the permanent posted speed limit is 50 m.p.h. or greater, and the spacing shall be 50 ft where the permanent posted speed limit is less than or equal to 45 m.p.h.
2. Unless otherwise noted, the spacing of channelizing devices in tapers shall be equal in feet to the permanent posted speed limit in m.p.h.
3. All channelizing devices shall satisfy NCHRP 350 or MASH crash evaluation criteria.
4. It is not necessary to delineate a drop-off of 3 in. or less adjacent to active travel lanes. Where channelizing devices are used to delineate drop-offs of 3 in. or less adjacent to active travel lanes, at least 33 in. of the device shall be above the adjoining pavement surface. Where channelizing devices are used to delineate a drop-off greater than 3 in. adjacent to active travel lanes, at least 27 in. of the device shall be above the adjoining pavement surface and a Type C warning light shall be attached to the top of the device (on the pavement side). In no case shall more than 9 in. of the device be below the adjoining pavement surface.
5. The proper orientation in respect to approaching vehicular traffic shall be maintained on channelizing devices. Drums are the preferred channelizing device in a tight radius curve and at intersections.
6. **Short-term stationary**, work that occupies a location for more than one hour within a single daylight period. **Intermediate-term stationary**, work that occupies a location for more than one daylight period up to three days, or nighttime work lasting more than one hour. **Long-term stationary**, work that occupies a location for more than three days.

INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DEVICES
INDEX AND GENERAL NOTES

SEPTEMBER 2022

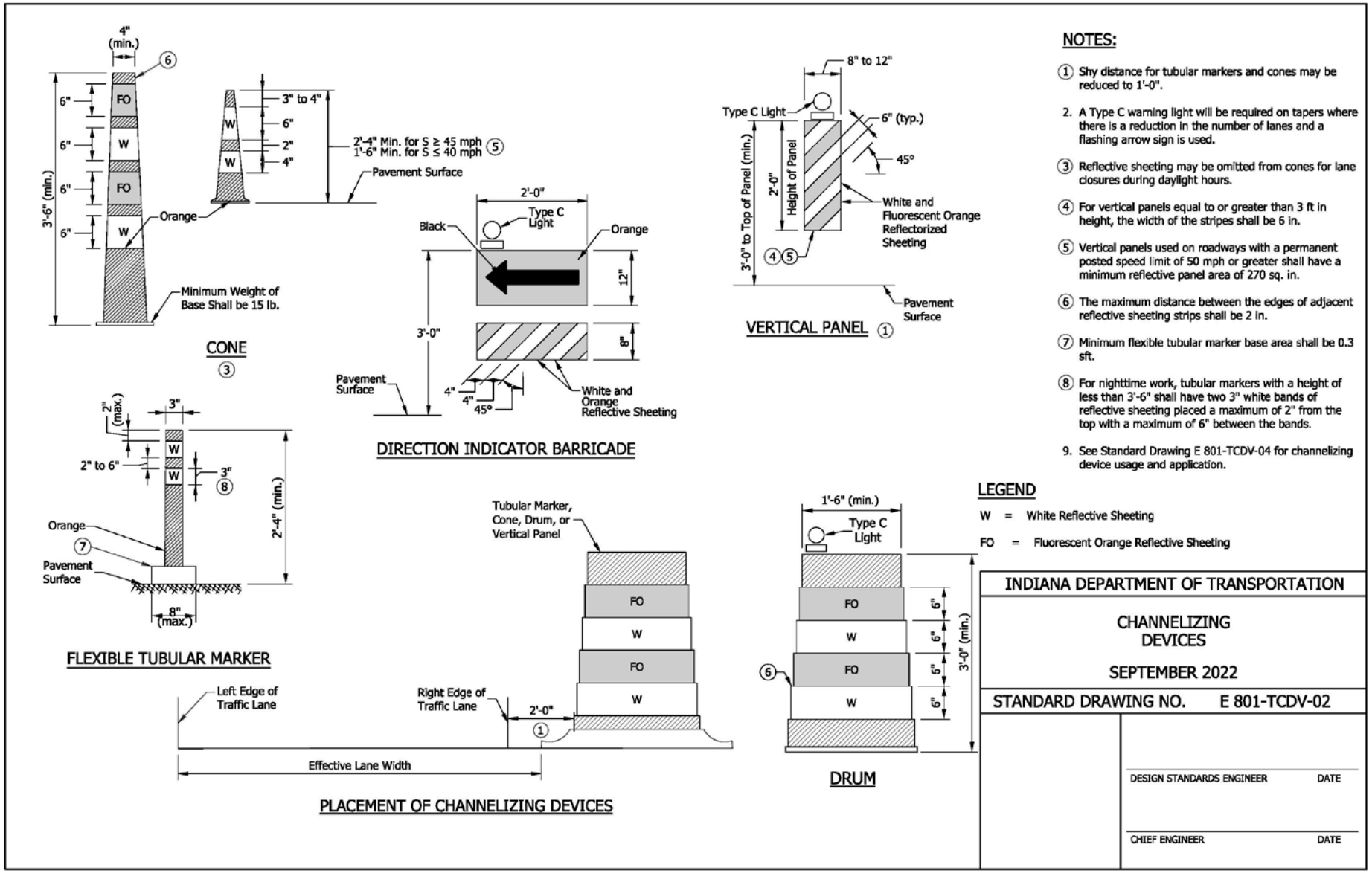
STANDARD DRAWING NO. E 801-TCDV-01

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

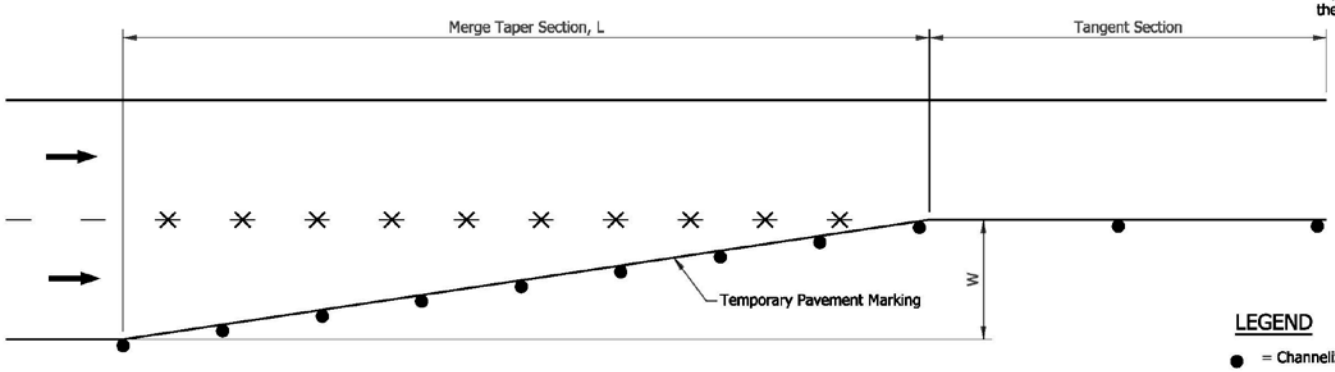


REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

NOTES:

1. For freeways, a taper length of 840 ft shall be used for the first merge taper. For subsequent merges, a length of 840 ft shall be used unless otherwise shown on the plans.
2. A shift taper preceded by a merge taper shall be separated by a tangent section equal to or greater than the length of the shift taper.



LEGEND

- ● = Channelizing Device
- ✕ = Removal of pavement markings and prismatic reflectors
- → = Direction of Traffic
- L = Minimum length of taper in ft
- S = Posted speed limit prior to the construction zone in mph
- W = Width of lane or shift in ft

MERGE TAPER				
S	Min. Taper Length L			
MPH	W = 9	W = 10	W = 11	W = 12
25	95	105	115	125
30	135	150	165	180
35	185	205	225	245
40	240	270	295	320
45	405	450	500	540
50	450	500	550	600
55	495	550	605	660
60	540	600	660	720
65	585	650	715	780
70	630	700	770	840
75	675	750	825	900

For W not shown in the table, L = W x S for a speed of 45 mph or greater.
L = W x S²/60 for a speed of 40 mph or lower.

SHIFT TAPER				
S	Min. Taper Length L/2			
MPH	W = 9	W = 10	W = 11	W = 12
25	50	55	60	65
30	70	75	85	90
35	95	105	115	125
40	120	135	150	160
45	205	225	250	270
50	225	250	275	300
55	250	275	305	330
60	270	300	330	360
65	295	325	360	390
70	315	350	385	420
75	340	375	415	450

For W not shown in the table, L is one half that required for a merge taper.

INDIANA DEPARTMENT OF TRANSPORTATION

MERGE OR SHIFT TAPER

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCDV-03

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

Channelizing Device Type	Usage Application									
	To delineate merge tapers on		To delineate tangents where adequate space exists and also lane shift tapers on		Where the effective lane width is less than 10 ft to delineate tangents in lieu of drums on		Where the effective lane width is less than 10 ft to delineate edge of pavement drop-off in lieu of drums on		To divide opposing lanes of traffic on	To divide two or more lanes of same direction traffic on
	Freeways	Non-Freeways	Freeways	Non-Freeways	Freeways	Non-Freeways	Freeways	Non-Freeways	Non-Freeways	Non-Freeways
18 in. Cone (1) ≤ 40 mph Posted Speed Limit	No	Yes (4)	No	Yes (4)	No	No	No	No	Yes (4)	Yes (4)
18 in. Cone ≥ 45 mph Posted Speed Limit	No	No	No	No	No	No	No	No	No	No
28 in. Cone (1) ≤ 40 mph Posted Speed Limit	No	Yes (5)	No	Yes (5)	No	No	No	No	Yes (5)	Yes (5)
28 in. Cone (2) 45 mph Posted Speed Limit	No	Yes (4)	No	Yes (4)	No	No	No	No	Yes (5)	Yes (5)
28 in. Cone ≥ 50 mph Posted Speed Limit	No	Yes (4)	No	Yes (4)	No	No	No	No	Yes (5)	Yes (5)
42 in. Channelizer (Cone) (1) (6) ≤ 45 mph Posted Speed Limit	No	Yes (5)	No	Yes (5)	Yes	Yes	Yes	Yes	Yes (5)	Yes (5)
42 in. Channelizer (Cone) (2) (6) ≥ 50 mph Posted Speed Limit	No	Yes (5)	No	Yes (5)	Yes	Yes	Yes	Yes	Yes (5)	Yes (5)
Direction Indicator Barricade (3)	Yes	Yes	No	No	No	No	No	No	No	No
Flexible Tubular Marker (3)	No	No	No	No	No	No	No	Yes	Yes	Yes
Vertical Panel (3)	No	Yes	No	Yes	No	Yes	No	Yes	No	No
Construction Drum (3)	Yes	Yes	Yes	Yes	No	No	No	No	No	No

CHANNELIZING DEVICE USAGE TABLE

NOTES:

(1) Spacing in tangent shall be 40 ft maximum; spacing between devices in taper shall be numerically equal in feet, maximum, to the posted speed limit in m.p.h.

(2) Spacing in tangent shall be 80 ft maximum; spacing between devices in taper shall be numerically equal in feet, maximum, to the posted speed limit in m.p.h.

(3) Spacing in tangents shall be 50 ft maximum when the speed limit is 45 m.p.h. or below; spacing in tangents shall be 100 ft maximum when the posted speed limit is 50 mph or above; in cases where the posted speed limit is intermittently set to 45 m.p.h. the channelizing devices shall be maintained at 90 ft maximum spacing; spacing of channelizing devices on tapers shall be numerically equal in feet, maximum, to the posted speed limit in m.p.h.

(4) May only be used for daylight restrictions.

(5) May not be used for long-term, stationary work (more than 3 days).

(6) 30 lb ballast configuration required.

7. For the purpose of channelizing device usage and spacing, the posted speed limit is the permanent posted speed limit, temporary speed limit, or worksite speed limit, whichever is lower.

INDIANA DEPARTMENT OF TRANSPORTATION

CHANNELIZING DEVICE USAGE

SEPTEMBER 2022

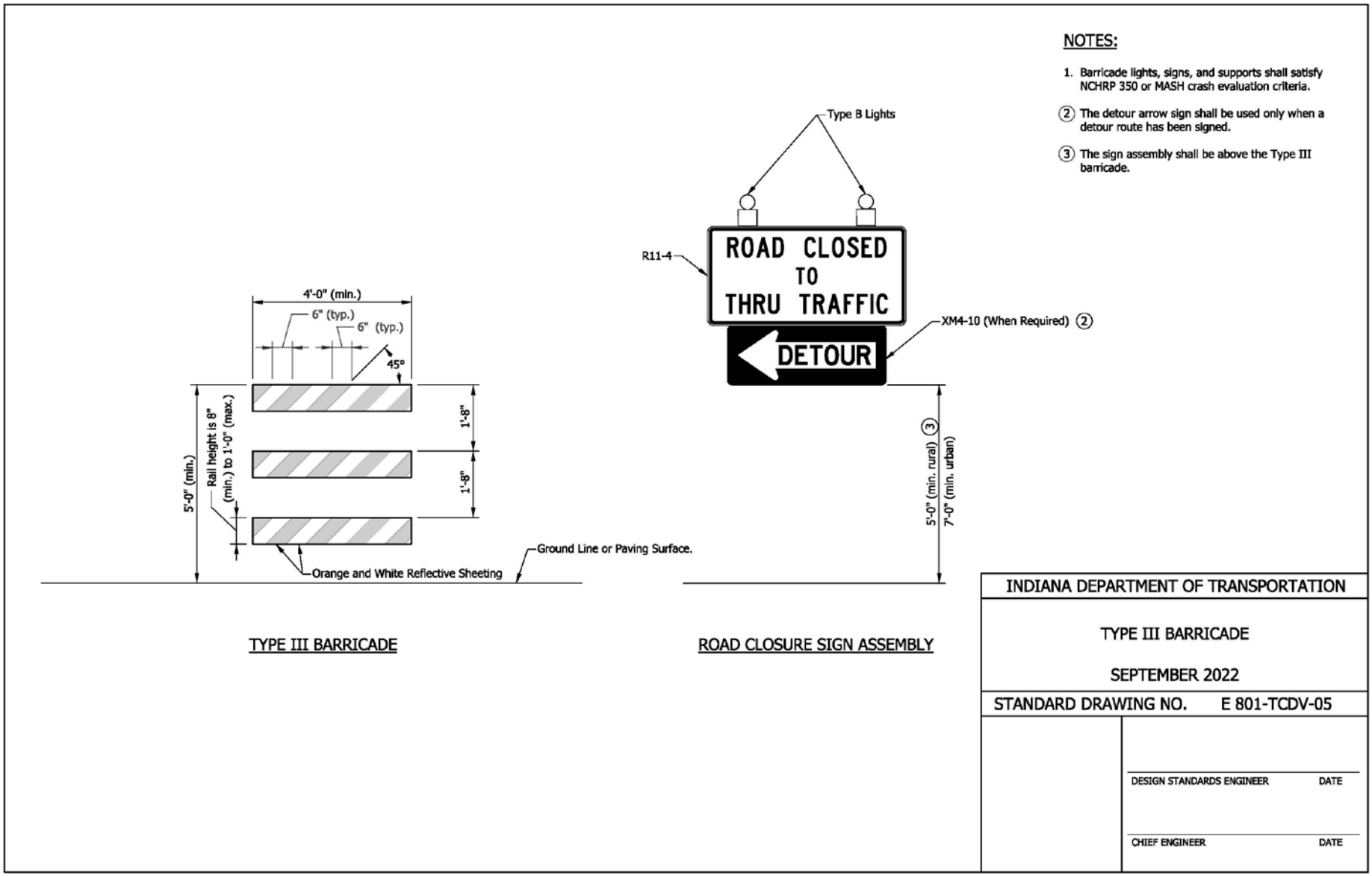
STANDARD DRAWING NO. E 801-TCDV-04

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

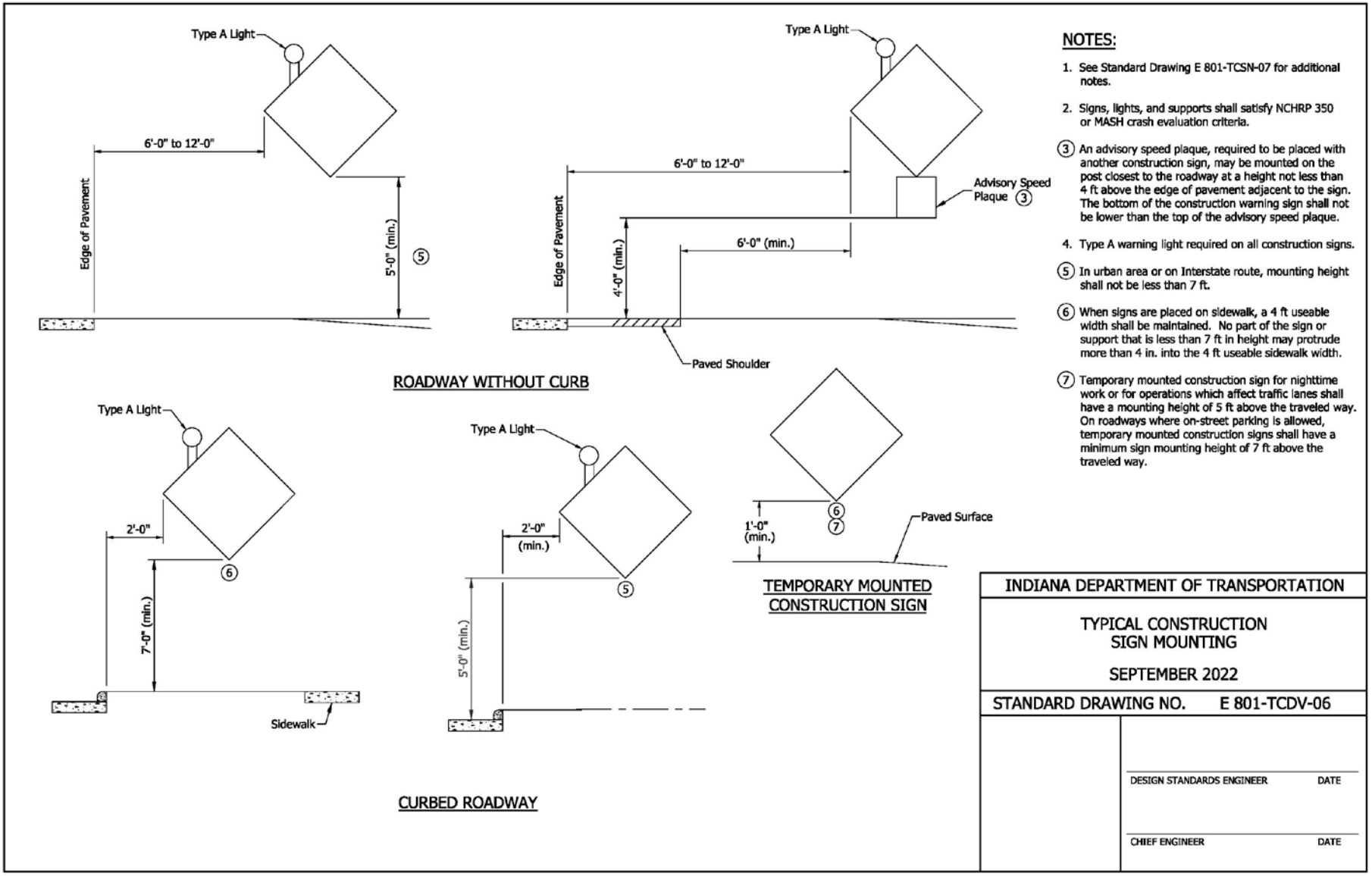
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



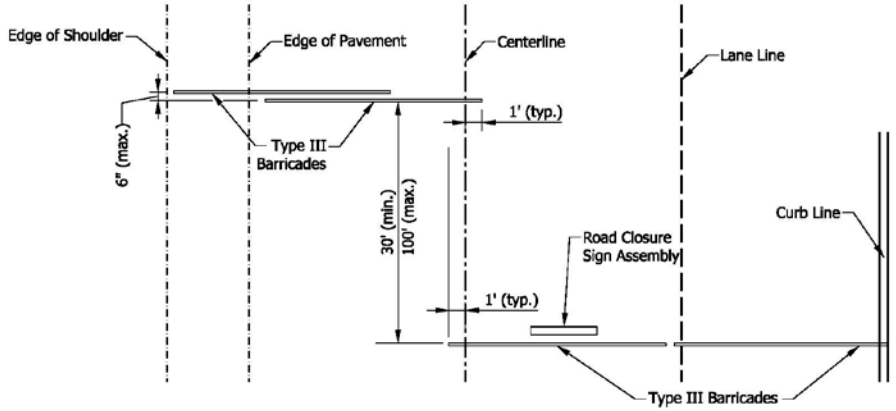
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

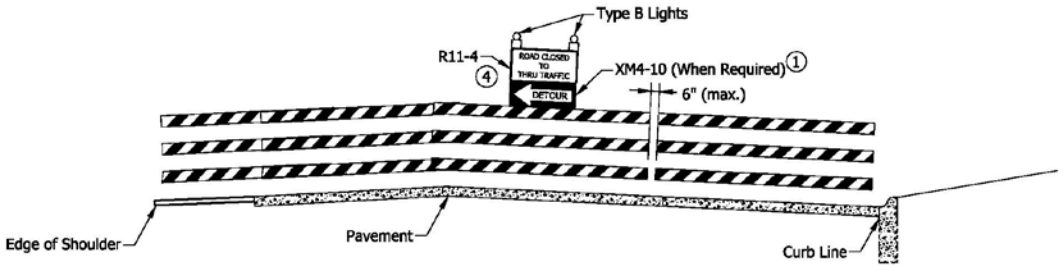


REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



PLAN VIEW



ELEVATION

NOTES:

1. The detour arrow (XM4-10) sign shall be used only when a detour route has been signed.
2. See Standard Drawing E 801-TCDV-06 for sign mounting information.
3. Barricades and supports shall satisfy NCHRP 350 or MASH crash evaluation criteria.
4. The R11-3a ("ROAD CLOSED/LOCAL TRAFFIC ONLY") sign may be substituted for the R11-4 sign as indicated on the plans or as directed by the engineer.

INDIANA DEPARTMENT OF TRANSPORTATION

TYPE III BARRICADE APPLICATION FOR ROAD CLOSURE FOR THRU TRAFFIC

SEPTEMBER 2022

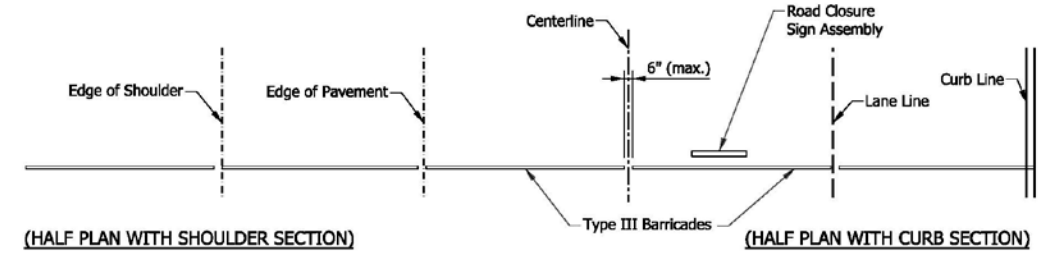
STANDARD DRAWING NO. E 801-TCDV-07

DESIGN STANDARDS ENGINEER DATE

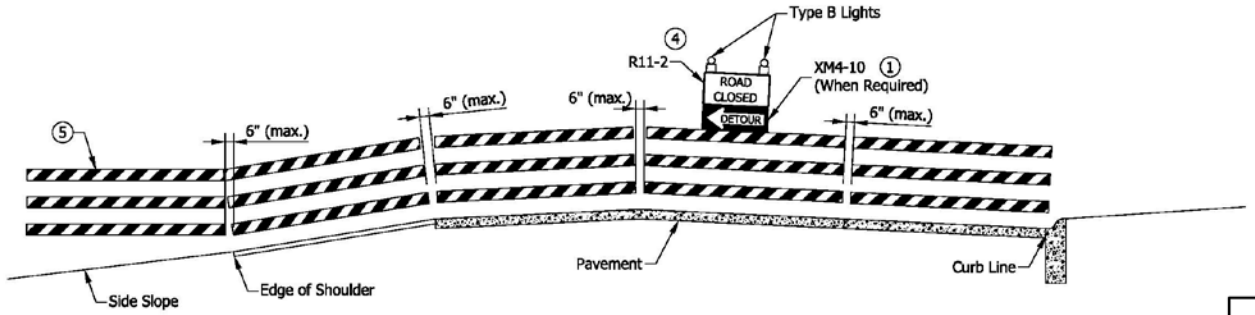
CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



PLAN VIEW



ELEVATION

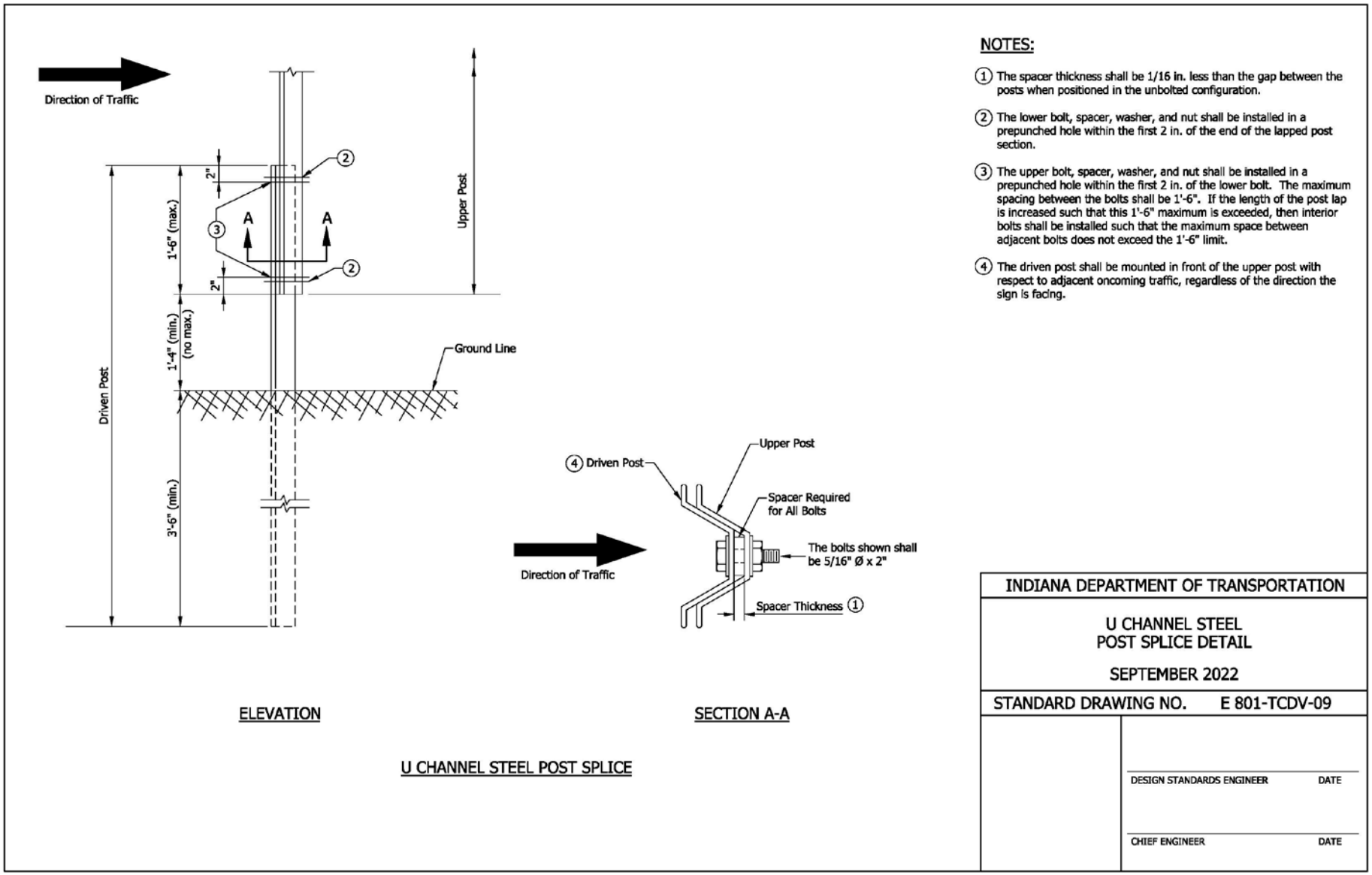
NOTES:

1. The detour arrow (XM 4-10) sign shall be used only when a detour route has been signed.
2. See Standard Drawing E 801-TCDV-06 for sign mounting information.
3. Barricades and supports shall satisfy NCHRP 350 or MASH crash evaluation criteria.
4. The sign legend of the R11-2 sign may be modified to "BRIDGE CLOSED" as indicated on the plans or as directed by the engineer.
5. Barricades shall be supported on driven posts in areas outside of the pavement or sidewalk, where side slopes are 3 to 1 or flatter.

INDIANA DEPARTMENT OF TRANSPORTATION	
TYPE III BARRICADE APPLICATION FOR ROAD CLOSURE TO ALL TRAFFIC SEPTEMBER 2022	
STANDARD DRAWING NO. E 801-TCDV-08	
	DESIGN STANDARDS ENGINEER DATE CHIEF ENGINEER DATE

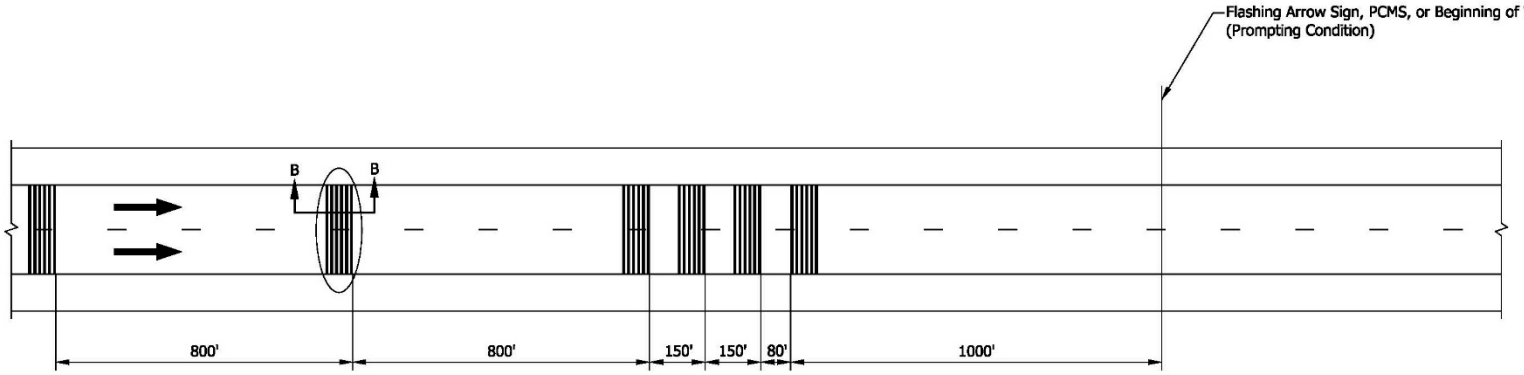
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

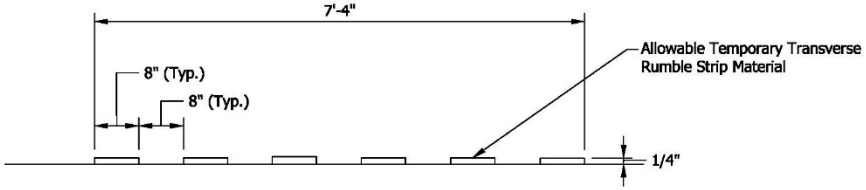
E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)





SECTION B-B

LEGEND

Direction of Traffic

INDIANA DEPARTMENT OF TRANSPORTATION

TEMPORARY TRANSVERSE RUMBLE STRIPS

SEPTEMBER 2022

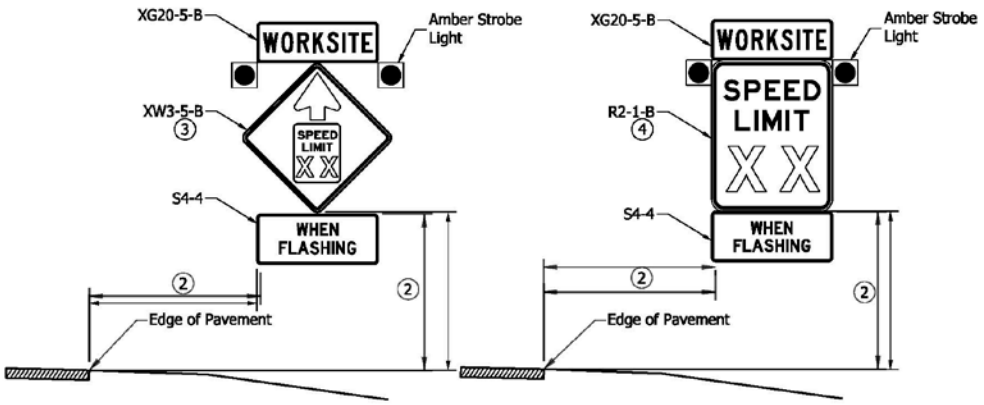
STANDARD DRAWING NO. E 801-TCDV-10

DESIGN STANDARDS ENGINEER DATE

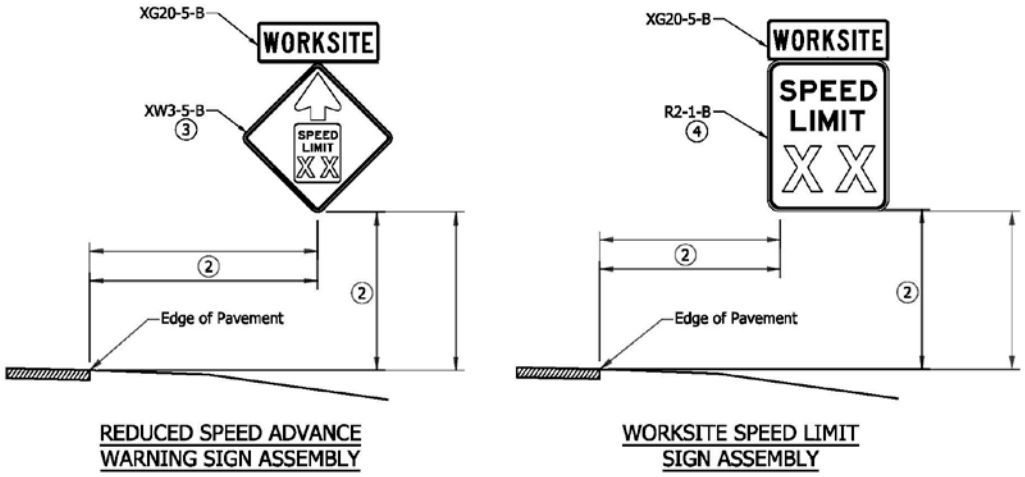
CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



INTERMITTENT USE TYPE



CONTINUOUS USE TYPE

NOTES:

1. If not trailer mounted, signs and supports shall satisfy NCHRP 350 or MASH crash evaluation criteria.
2. See Standard Drawing E 801-TCDV-06 for lateral and vertical placement.
3. The speed limit on advance warning signs shall match the worksite speed limit signs.
4. The worksite speed limit shall be at least 10 mph but no more than 15 mph below the permanent posted speed limit for the roadway under construction unless otherwise specified on the plans.
5. Sign series shown is for freeway or expressway application.

INDIANA DEPARTMENT OF TRANSPORTATION

WORKSITE SPEED LIMIT SIGN ASSEMBLY

SEPTEMBER 2022

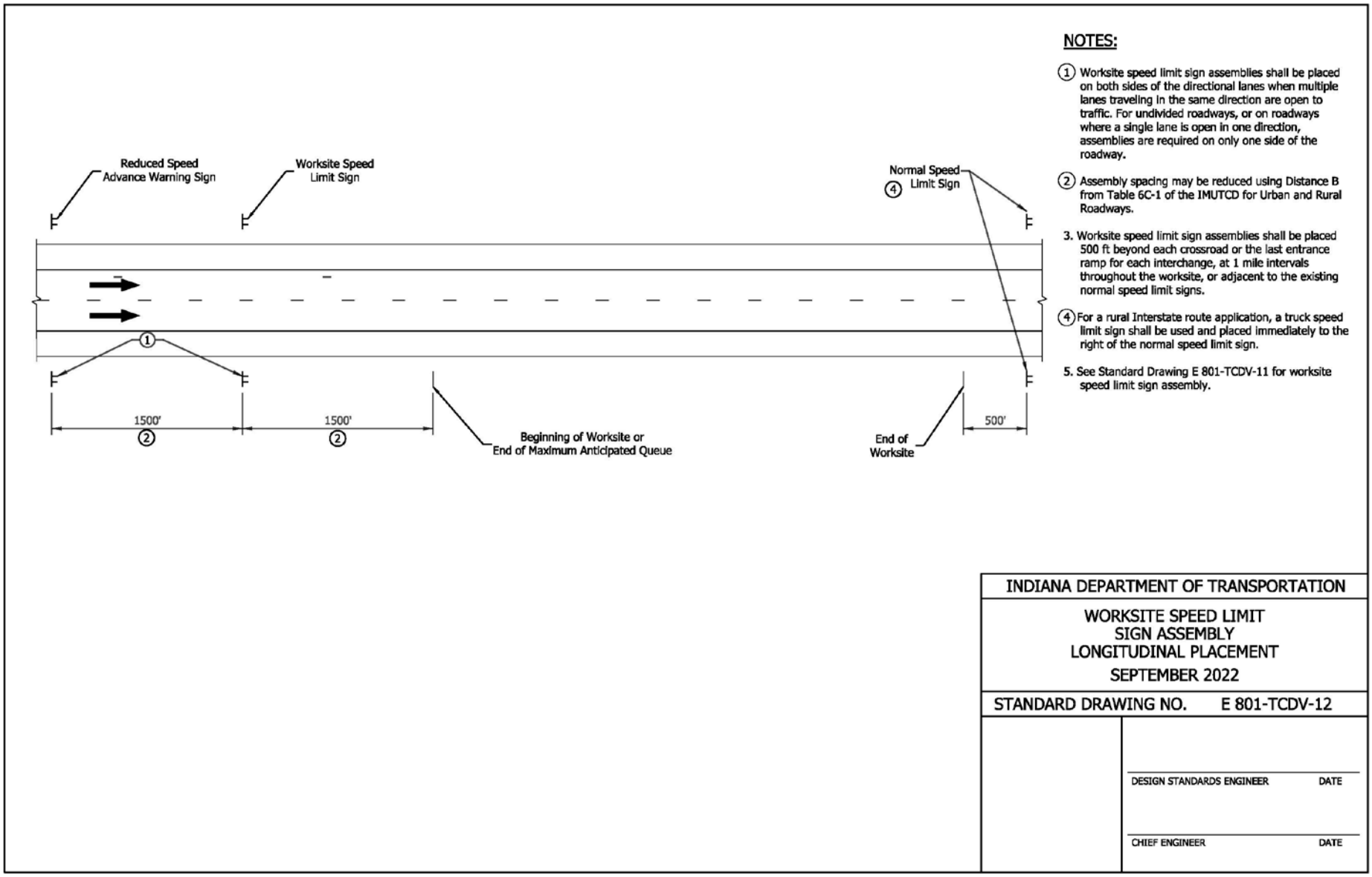
STANDARD DRAWING NO. E 801-TCDV-11

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

① Worksite speed limit sign assemblies shall be placed on both sides of the directional lanes when multiple lanes traveling in the same direction are open to traffic. For undivided roadways, or on roadways where a single lane is open in one direction, assemblies are required on only one side of the roadway.

② Assembly spacing may be reduced using Distance B from Table 6C-1 of the IMUTCD for Urban and Rural Roadways.

3. Worksite speed limit sign assemblies shall be placed 500 ft beyond each crossroad or the last entrance ramp for each interchange, at 1 mile intervals throughout the worksite, or adjacent to the existing normal speed limit signs.

④ For a rural Interstate route application, a truck speed limit sign shall be used and placed immediately to the right of the normal speed limit sign.

5. See Standard Drawing E 801-TCDV-11 for worksite speed limit sign assembly.

INDIANA DEPARTMENT OF TRANSPORTATION	
WORKSITE SPEED LIMIT SIGN ASSEMBLY LONGITUDINAL PLACEMENT SEPTEMBER 2022	
STANDARD DRAWING NO. E 801-TCDV-12	
	DESIGN STANDARDS ENGINEER DATE CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

INDEX	
SHEET NO.	SUBJECT
1	Stationary Lane Closure Index and General Notes
2	Long-Term Stationary Freeway Right Lane Closure
3	Short or Intermediate Term Stationary Freeway Right Lane Closure
4	Short or Intermediate Term Stationary Freeway Right Lane Closure with Minor Encroachment
5	Long-Term Stationary Freeway Left Lane Closure
6	Short or Intermediate Term Stationary Freeway Left Lane Closure
7	Short or Intermediate Term Stationary Freeway Left Lane Closure with Minor Encroachment
8	Short or Intermediate Term Stationary Double Lane Closure Freeway for Work in the Center Lane
9	Short or Intermediate Term Stationary Double Lane Closure Freeway with Minor Encroachment
10	Short or Intermediate Term Stationary Freeway Right Lane Closure Near Interchange with Exit Open
11	Traffic Control for Freeway Exit Closure
12	Short or Intermediate Term Stationary Lane Closure on Three Lane Road

LEGEND

- Work Area
- Flashing Arrow Sign
- Channelizing Device
- Construction Sign and Supports
- Removal of Pavement Markings and Prismatic Reflectors
- Type III-A Barricades
- Direction of Traffic
- Low Intensity Construction Warning Light, Type A
- Shadow Vehicle with Truck-Mounted Attenuator, Arrow Board, and Strobe Lights
- Type III-Barricade
- Crash Cushion

GENERAL NOTES:

1. **Short-term stationary**, work that occupies a location for more than one hour within a single daylight period.
   Intermediate-term stationary, work that occupies a location for more than one daylight period up to three days, or nighttime work lasting more than one hour.
   Long-term stationary, work that occupies a location for more than three days.
2. Distances shown may be varied based on field conditions with approval from the Engineer.
3. Unless otherwise noted, the spacing of channelizing devices in tangent sections shall be 100 ft where the posted speed limit is 50 m.p.h. or greater, and the spacing shall be 50 ft where the posted speed limit is less than or equal to 45 m.p.h.
4. Unless otherwise noted, the spacing of channelizing devices in tapers shall be equal in feet to the posted speed limit in m.p.h.
5. The sign spacing shown for freeway lane closures may be reduced to 500 ft for lane closures on rural undivided highways.
6. For interstate lane closures road construction 3 miles, road construction 2 miles, and road construction 1½ mile signs shall be placed in advance of the road construction ahead sign.
7. Temporary pavement markings may be omitted for short-term and intermediate-term stationary daylight lane closures.
8. Temporary highway illumination, when specified, shall be as detailed on the plans.
9. Channelizing devices and barrels are schematic and are only intended to show placement and not number or spacing.

INDIANA DEPARTMENT OF TRANSPORTATION

STATIONARY LANE CLOSURE INDEX AND GENERAL NOTES

SEPTEMBER 2022

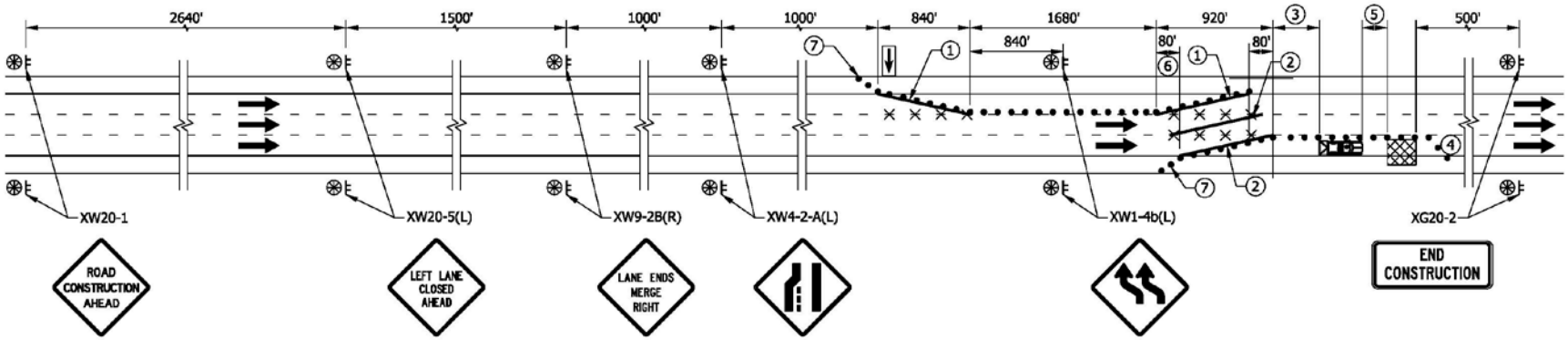
STANDARD DRAWING NO. E 801-TCLC-01

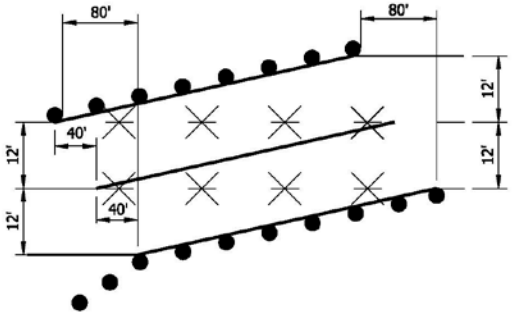
DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)





DETAIL A

NOTES:

(1) Yellow Edge Line

(2) White Edge Line

(3) Longitudinal Buffer Length, see table.

(4) Downstream taper after work area shall extend 100 ft on freeway and drums shall be spaced 20 ft. The downstream taper may be omitted if necessary for work vehicle access.

(5) Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.

(6) Unless otherwise specified on the plans, stagger lane shift to increase lane width through the shift. The temporary lane line in the middle shall be offset 40 ft from each temporary edge line for 12 ft lanes, see Detail A. For double lane shifts that go from 12 ft lanes to 11 ft lanes, the temporary lane line in the middle shall be offset 80 ft from each temporary edge line.

(7) Shoulder taper of ⅓ L. See Standard Drawing series E 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

LONG-TERM STATIONARY FREEWAY
RIGHT LANE CLOSURE

SEPTEMBER 2022

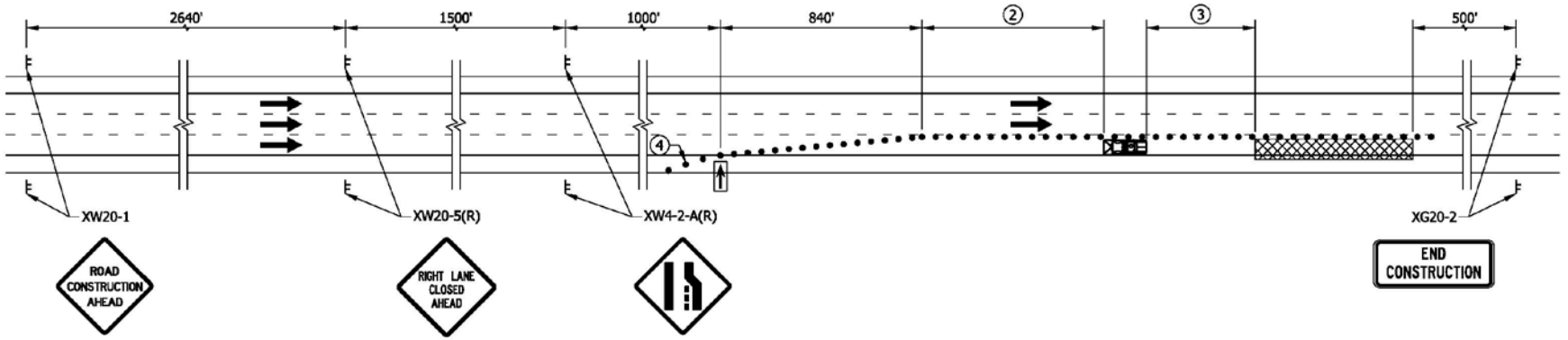
STANDARD DRAWING NO. E 801-TCLC-02

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. See Standard Drawing series E 801-TCDV for merge distance, L.
2. (2) Longitudinal Buffer Length, see table.
3. (3) Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.
4. (4) Shoulder taper of ⅓ L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY FREEWAY RIGHT LANE CLOSURE

SEPTEMBER 2021

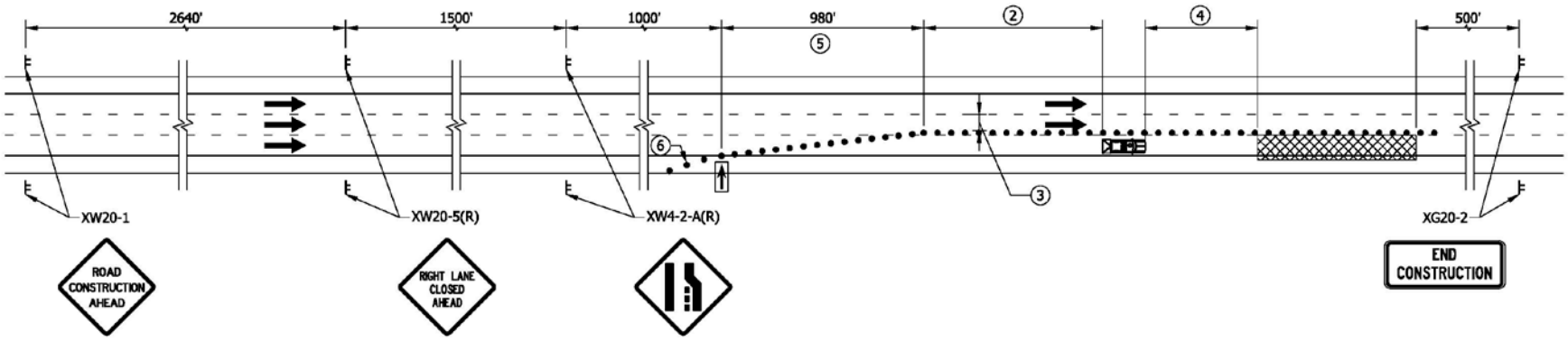
STANDARD DRAWING NO. E 801-TCLC-03

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. See Standard Drawing series E 801-TCDV for merge distance, L.
2. Longitudinal Buffer Length, see table.
3. Lane width shall be a minimum width of 10 ft.
4. Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.
5. Use a separate shift taper separated by a distance of 2L if a merge taper is wider than 14 ft.
6. Shoulder taper of ⅓ L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY
FREEWAY RIGHT LANE CLOSURE
WITH MINOR ENCROACHMENT

SEPTEMBER 2022

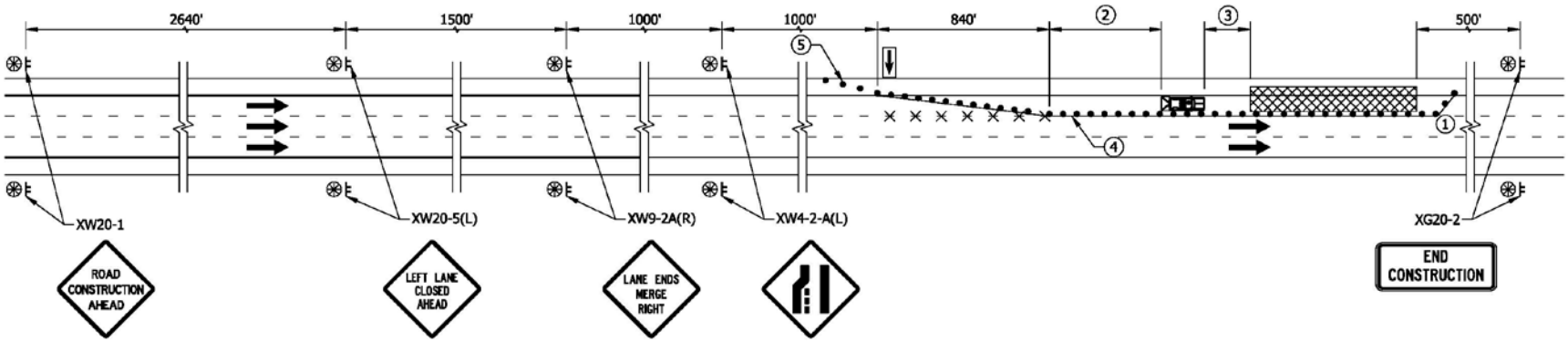
STANDARD DRAWING NO. E 801-TCLC-04

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. The downstream taper after work area shall extend 100 ft of roadway and drums shall be spaced 20 ft. The downstream taper may be omitted if necessary for work vehicle access.
2. Longitudinal Buffer Length, see table
3. Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.
4. Yellow Edge Line
5. Shoulder taper of ⅓ L. See Standard Drawing series E 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

LONG-TERM STATIONARY FREEWAY
LEFT LANE CLOSURE

SEPTEMBER 2022

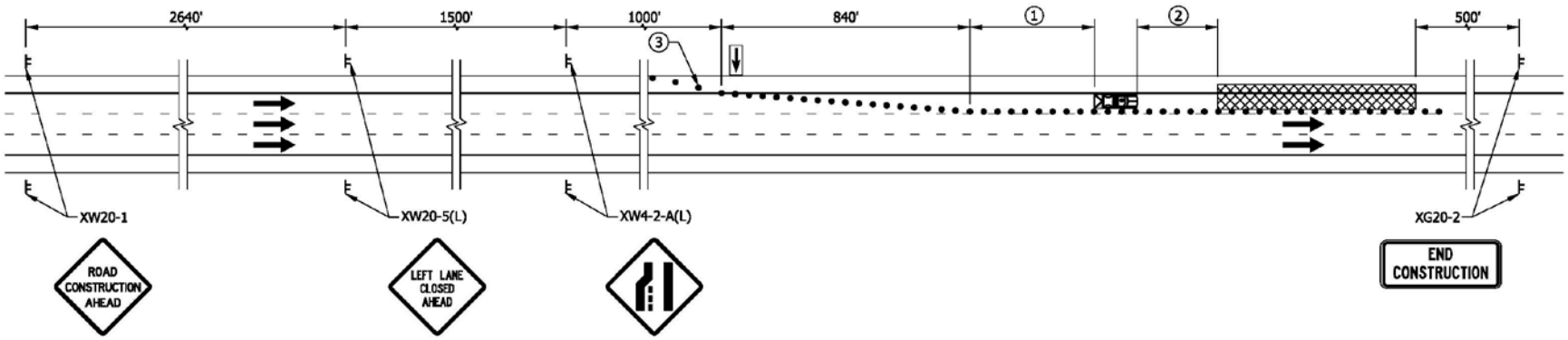
STANDARD DRAWING NO. E 801-TCLC-05

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

① Longitudinal Buffer Length, see table.

② Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.

③ Shoulder taper of ⅓ L. See Standard Drawing series E 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY FREEWAY LEFT LANE CLOSURE

SEPTEMBER 2022

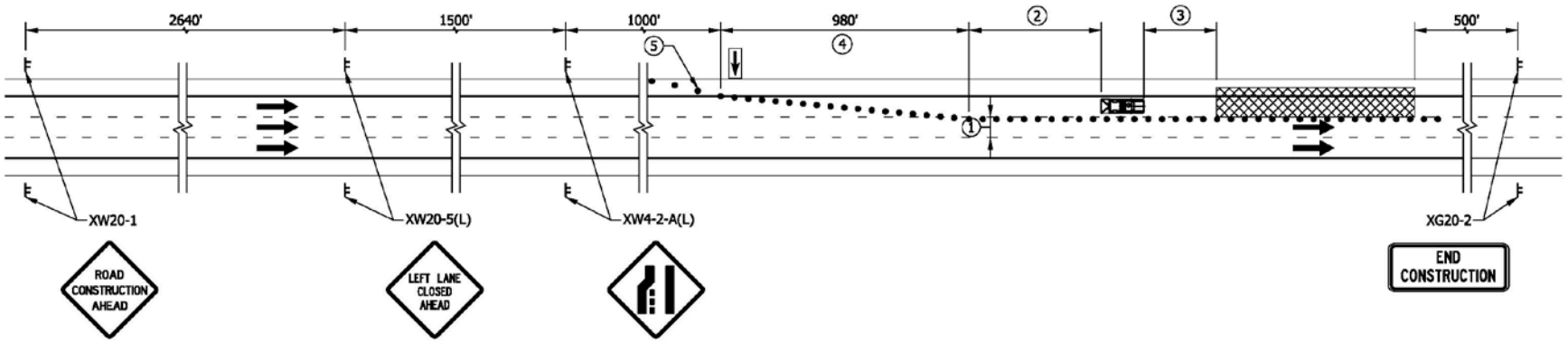
STANDARD DRAWING NO. E 801-TCLC-06

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

(1) 10 ft minimum lane width

(2) Longitudinal Buffer Length, see table

(3) Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.

(4) Use a separate shift taper separated by a distance of 2L if a merge taper is wider than 14 ft.

(5) Shoulder taper of ⅓ L, see Standard Drawing series E 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY FREEWAY LEFT LANE CLOSURE WITH MINOR ENCROACHMENT

SEPTEMBER 2022

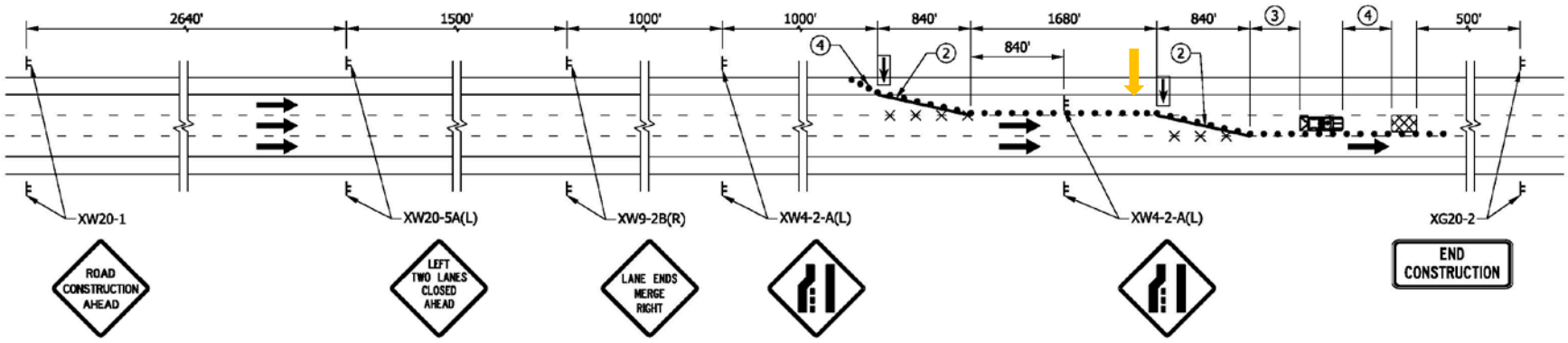
STANDARD DRAWING NO. E 801-TCLC-07

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. Use temporary concrete traffic barrier or reversible lane with moveable barrier in lieu of drums if required by the designer.

(2) Yellow Edge Line

(3) Longitudinal Buffer Length, see table.

(4) Shoulder taper ⅓ L. See Standard Drawing series 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY DOUBLE LANE CLOSURE FOR WORK IN THE CENTER LANE

SEPTEMBER 2022

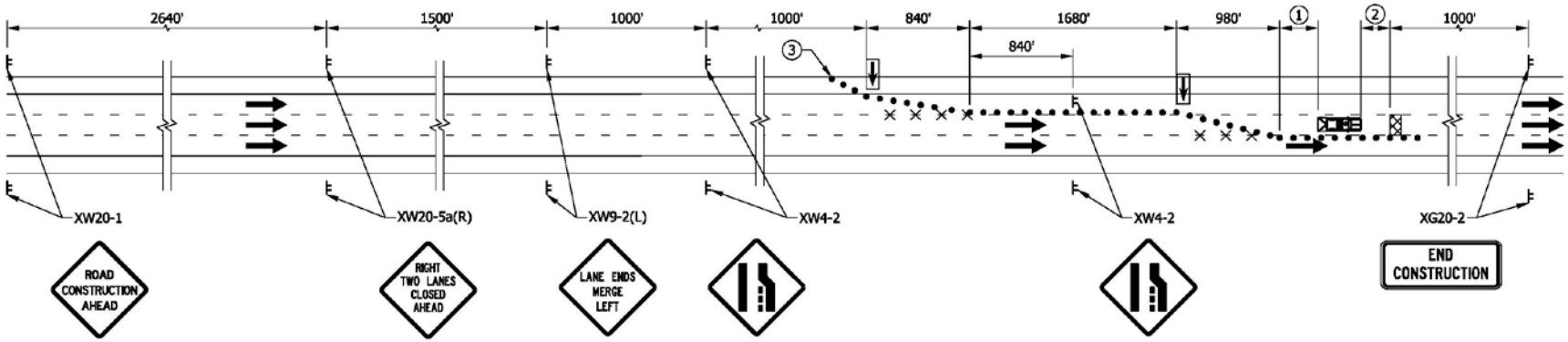
STANDARD DRAWING NO. E 801-TCLC-08

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. Longitudinal Buffer Length, see table.
2. Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.
3. Shoulder taper of ⅓ L, see Standard Drawing series E 801-TCDV for distance, L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY
FREEWAY DOUBLE LANE CLOSURE
WITH MINOR ENCROACHMENT
SEPTEMBER 2022

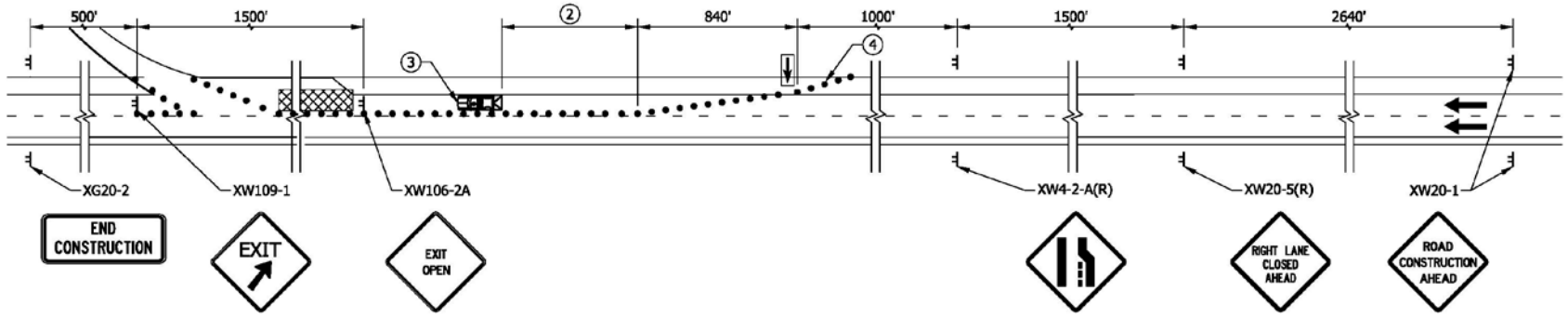
STANDARD DRAWING NO. E 801-TCLC-09

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. See Standard Drawing series E 801-TCDV for merge distance, L.
2. Longitudinal Buffer Length, see table.
3. Shadow vehicle roll ahead distance shall be as recommended by the truck mounted attenuator manufacturer.
4. Shoulder taper of ⅓ L.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY
FREEWAY RIGHT LANE CLOSURE
NEAR INTERCHANGE WITH EXIT OPEN
SEPTEMBER 2022

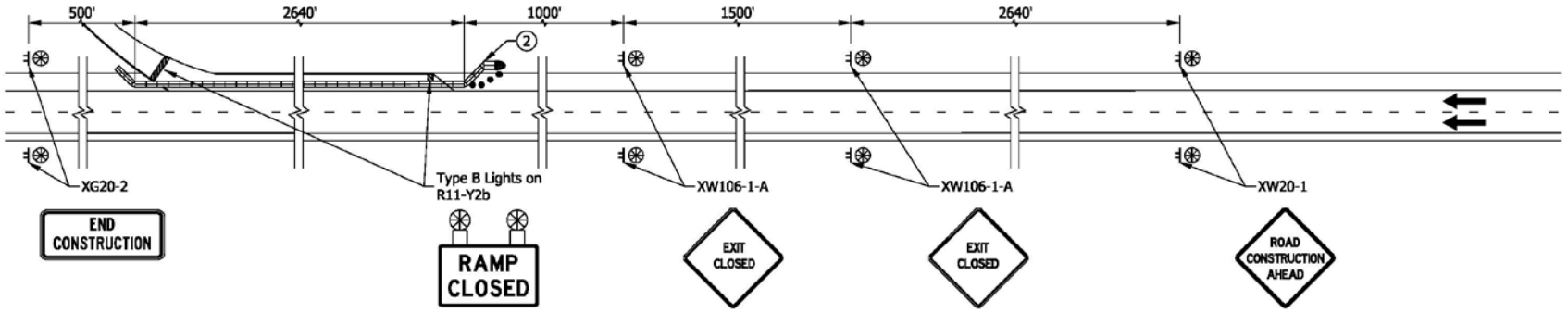
STANDARD DRAWING NO. E 801-TCLC-10

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. Temporary traffic barrier shall be used for long-term stationary work. For short-term or intermediate-term stationary work, drums spaced at 20 ft may be used in lieu of temporary traffic barrier.

(2) Flared temporary traffic barrier or approved end treatment flare rate 16:1 to edge of shoulder.

INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL FOR FREEWAY EXIT CLOSURE

SEPTEMBER 2022

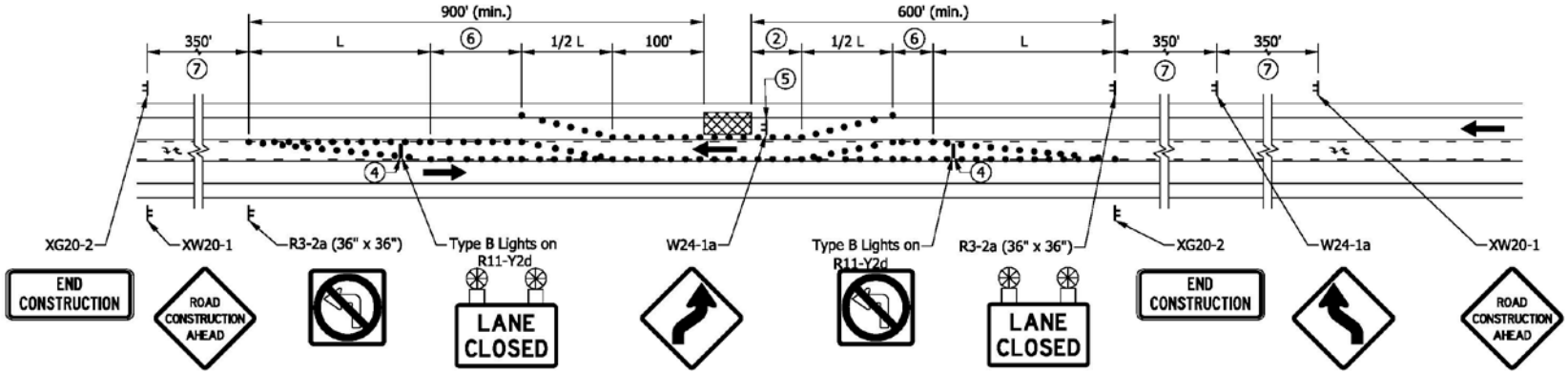
STANDARD DRAWING NO. E 801-TCLC-11

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



NOTES:

1. See Standard Drawing series E 801-TCDV for merge distance, L.
2. Longitudinal Buffer Length, see table.
3. R3-2A must be repeated at each intersection and at class 3 and 4 drives.
4. Type III Barricade
5. The lane-shift sign shall be placed 350 ft in advance of the return lane-shift.
6. Access Control Buffer, if required.
7. For urban locations where the speed limit is ≤ 35 mph, the sign spacing may be reduced to 100 ft.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHORT OR INTERMEDIATE TERM STATIONARY LANE CLOSURE ON THREE LANE ROAD

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCLC-12

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

INDEX	
SHEET NO.	SUBJECT
1	Shoulder Closures, Index and General Notes
2	Advance Signing for Interstate Shoulder Closures
3	Shoulder Closure on Freeway or Expressway
4	Freeway Shoulder Closure for Roadside Work
5	Shoulder Closure on Divided Highway with Local Access
6	Shoulder Closure on Two-Lane Highway with Local Access

LEGEND

GENERAL NOTES:

1. Unless otherwise noted, the spacing of channelizing devices in tangent sections shall be 100 ft where the posted speed limit is 50 mph or greater, and the spacing shall be 50 ft where the posted speed limit is less than or equal to 45 mph.
2. Unless otherwise noted, the spacing of channelizing devices in tapers shall be equal in feet to 1.0 times the posted speed limit in mph.
3. Channelizing devices as shown are schematic, the number of channelizing devices will vary based on field conditions.
4. The longitudinal buffer space is an area that provides recovery space for an errant vehicle. Values in the table below may be used to determine the length of the longitudinal buffer.

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
≤30	200
35	250
40	305
45	360
50	425
55	495

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CLOSURES,
INDEX AND GENERAL NOTES

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCSC-01

DESIGN STANDARDS ENGINEER DATE

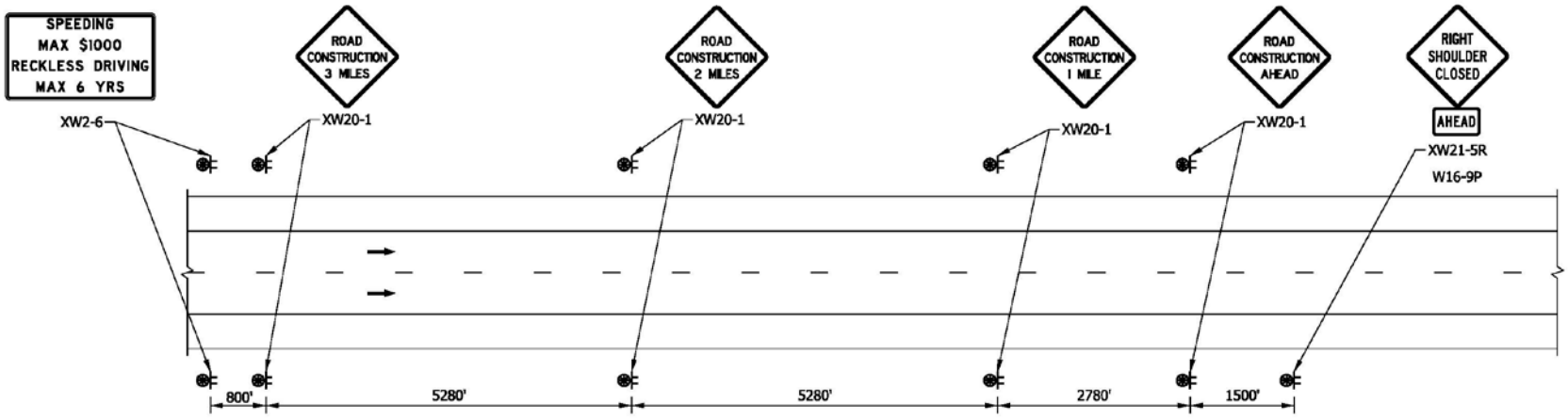
CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

NOTES:

1. For sign sequence continuation, see freeway shoulder closure in Standard Drawing E 801-TCSC-03.
2. Advance signing is not required for work zone durations ≤ 1 hr.



LEGEND

- Construction Sign and Supports
- Construction Warning Light, Type A
- Direction of Traffic

INDIANA DEPARTMENT OF TRANSPORTATION

ADVANCE SIGNING FOR
INTERSTATE SHOULDER CLOSURE

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCSC-02

DESIGN STANDARDS ENGINEER DATE

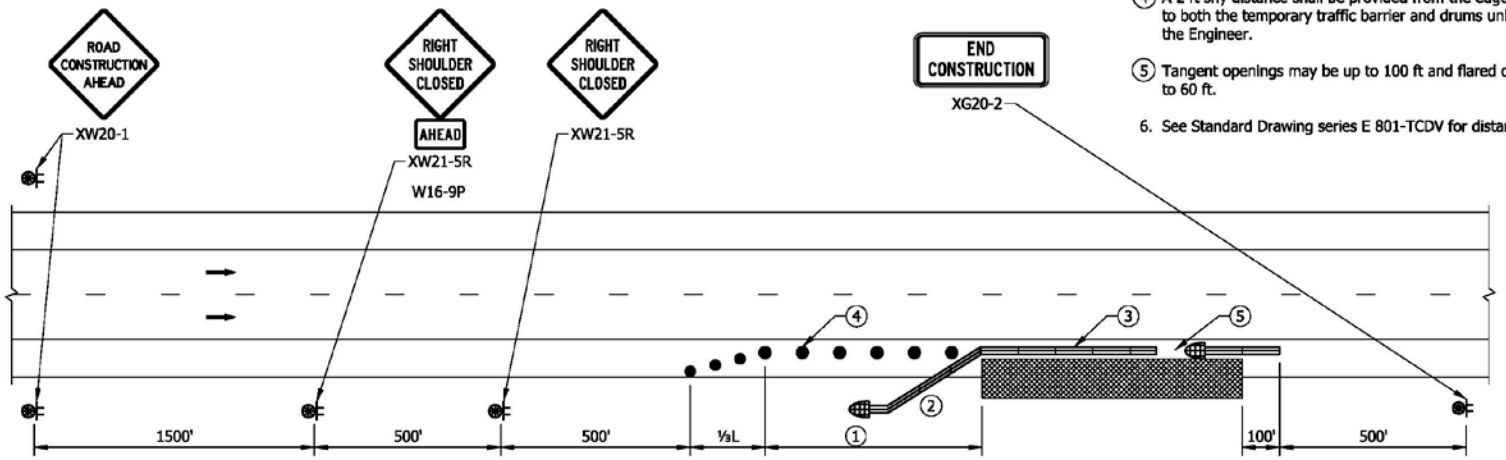
CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

NOTES:

1. Longitudinal Buffer Length, see table.
2. Flared rate for temporary traffic barrier shall be 16:1 to edge of shoulder or approved end treatment shall be used.
3. Drums may be used for freeway shoulder closures of 3 days or less.
4. A 2 ft shy distance shall be provided from the edge of the travel lane to both the temporary traffic barrier and drums unless approved by the Engineer.
5. Tangent openings may be up to 100 ft and flared openings may be up to 60 ft.
6. See Standard Drawing series E 801-TCDV for distance, L.



LEGEND

- Temporary Traffic Barrier
- Channelizing Device
- Construction Sign and Supports
- Construction Warning Light, Type A
- Direction of Traffic
- Crash Cushion
- Work Area

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
≤30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CLOSURE ON FREEWAY OR EXPRESSWAY

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCSC-03

DESIGN STANDARDS ENGINEER DATE

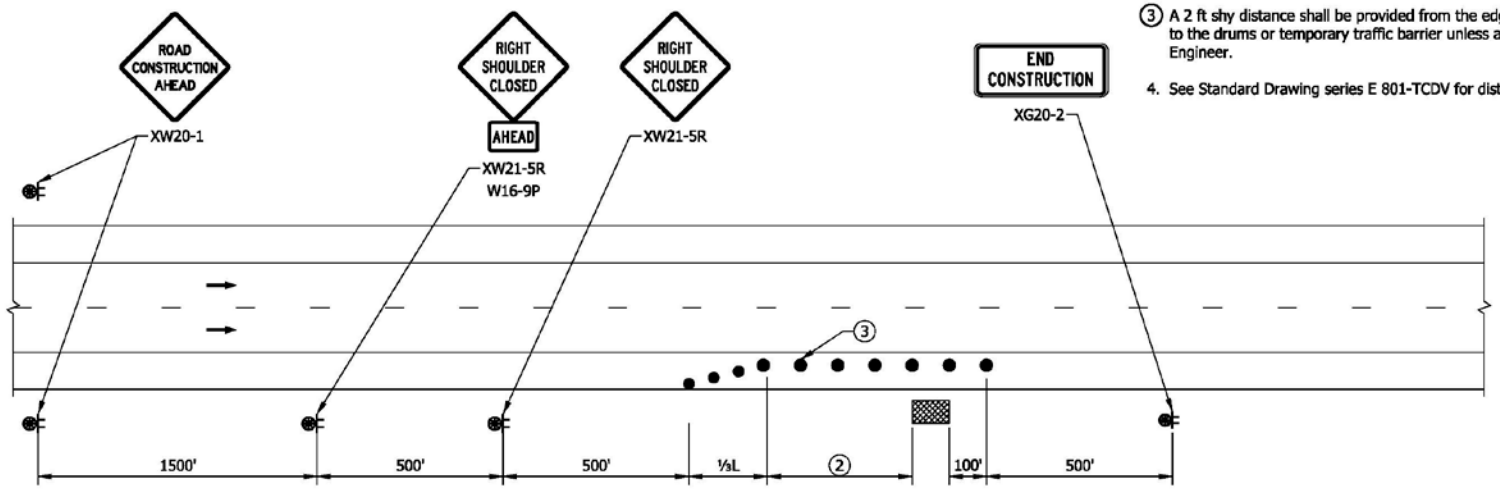
CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

NOTES:

1. Temporary traffic barrier shall be used in place of drums for work that occupies a location for more than 14 days.
2. Longitudinal Buffer Length, see table.
3. A 2 ft shy distance shall be provided from the edge of the travel lane to the drums or temporary traffic barrier unless approved by the Engineer.
4. See Standard Drawing series E 801-TCDV for distance, L.



LEGEND

- Work Area
- Channelizing Device
- Construction Sign and Supports
- Construction Warning Light, Type A
- Direction of Traffic

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
≤30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

INDIANA DEPARTMENT OF TRANSPORTATION

FREEWAY SHOULDER CLOSURE FOR ROADSIDE WORK

SEPTEMBER 2022

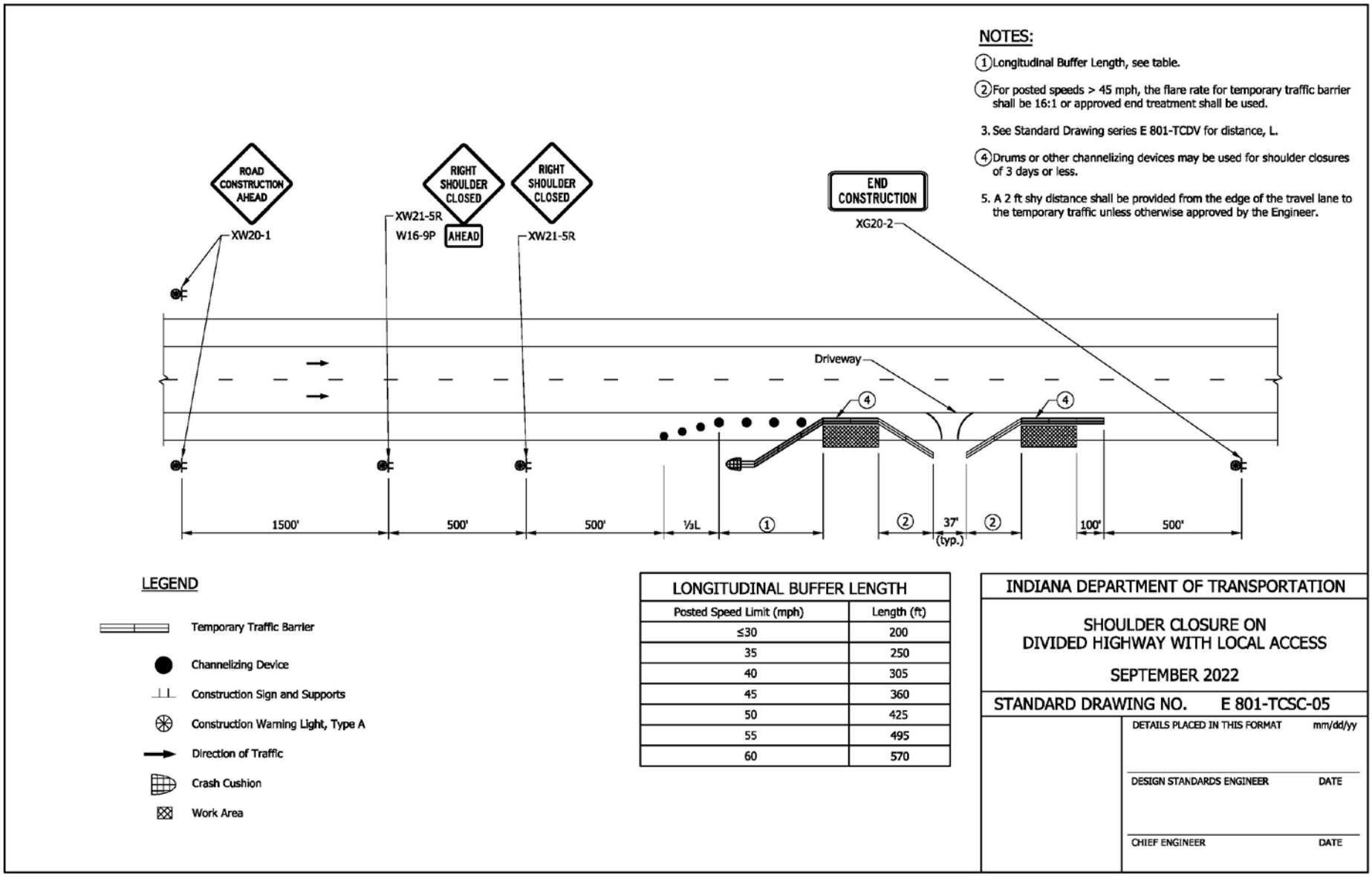
STANDARD DRAWING NO. E 801-TCSC-04

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

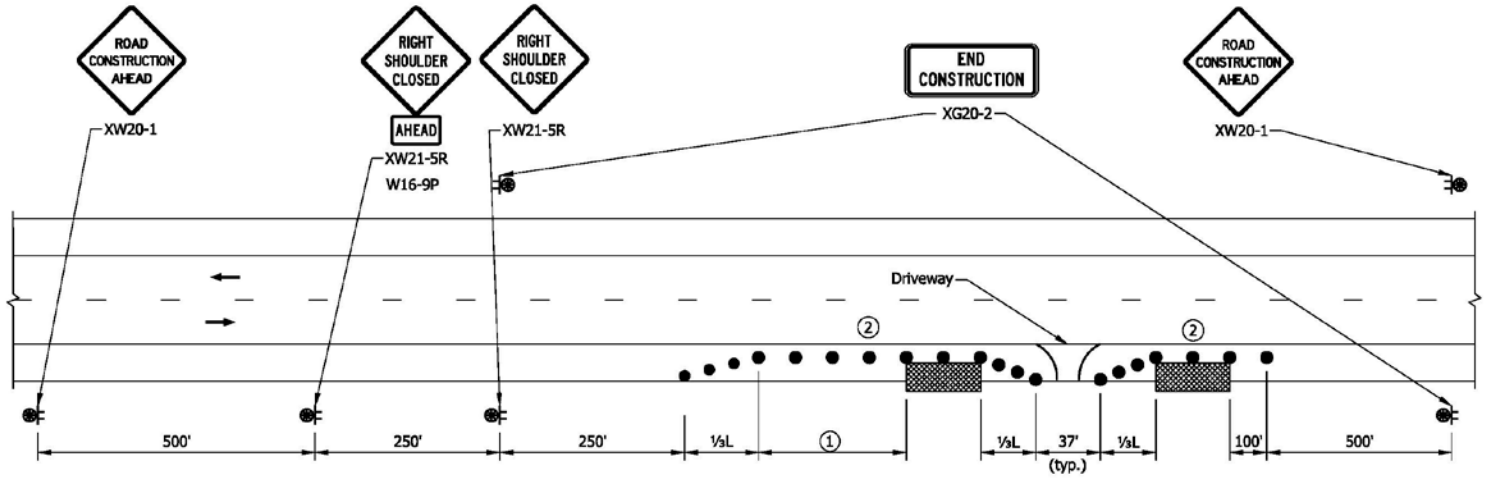


REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

NOTES:

1. Longitudinal Buffer Length, see table.
2. Use temporary traffic barrier if required by designer.
3. See Standard Drawing series E 801-TCDV for distance, L.



LEGEND

- Temporary Traffic Barrier
- Channelizing Device
- Construction Sign and Supports
- Construction Warning Light
- Direction of Traffic
- Crash Cushion
- Work Area

LONGITUDINAL BUFFER LENGTH	
Posted Speed Limit (mph)	Length (ft)
≤30	200
35	250
40	305
45	360
50	425
55	495

INDIANA DEPARTMENT OF TRANSPORTATION

SHOULDER CLOSURE ON
TWO LANE HIGHWAY WITH LOCAL ACCESS

SEPTEMBER 2022

STANDARD DRAWING NO. E 801-TCSC-06

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

INDEX	
SHEET NO.	SUBJECT
1	Temporary Closures, Index and General Notes
2	Temporary Closures of a Divided Highway
3	Temporary Closure of a Freeway or Expressway with Detour
4	Temporary Closures for Project Following Completion of Grading Contract

INDIANA DEPARTMENT OF TRANSPORTATION

TEMPORARY CLOSURES,
INDEX AND GENERAL NOTES

SEPTEMBER 2022

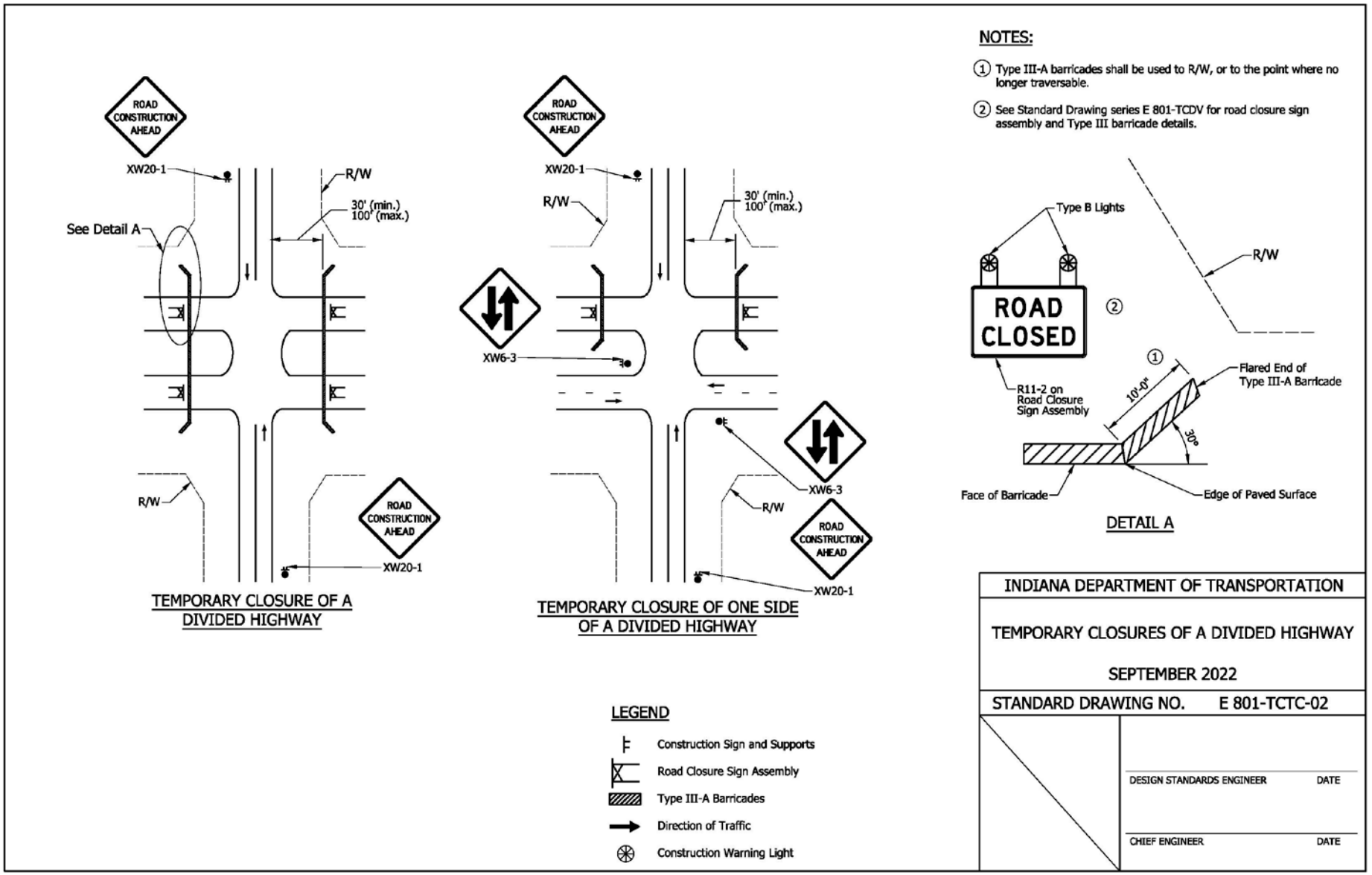
STANDARD DRAWING NO. E 801-TCTC-01

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)

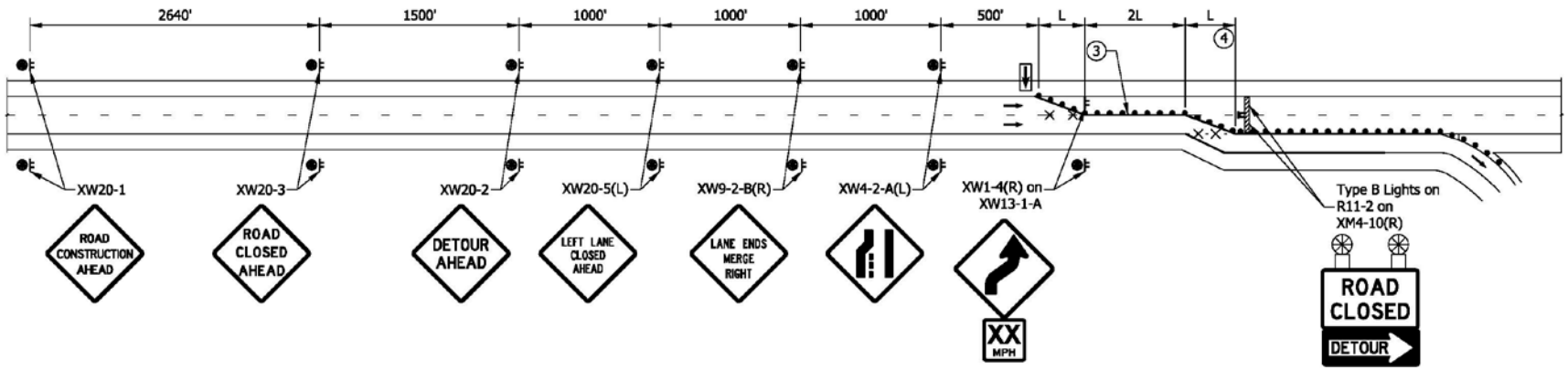
NOTES:

1. See Standard Drawing E 801-TCDV-03 for merge distance, L. The value of L on freeways shall be based on 70 mph.
2. Channelizing devices shall not encroach into travel lane.

(3) Yellow line, not required for closures ≤ 3 days.

(4) Channelizing device spacing in taper shall be 20 ft

5. See Standard Drawing E 801-TCLC-01 for advance signing requirements for interstate applications.



LEGEND

- Flashing Arrow Sign
- Channelizing Device
- Construction Sign and Supports
- Removal of Pavement Markings and Prismatic Reflectors
- Type III-A Barricades
- Direction of Traffic
- Construction Warning Light
- Road Closure Sign Assembly

INDIANA DEPARTMENT OF TRANSPORTATION

TEMPORARY CLOSURE OF FREEWAY OR EXPRESSWAY WITH DETOUR

SEPTEMBER 2022

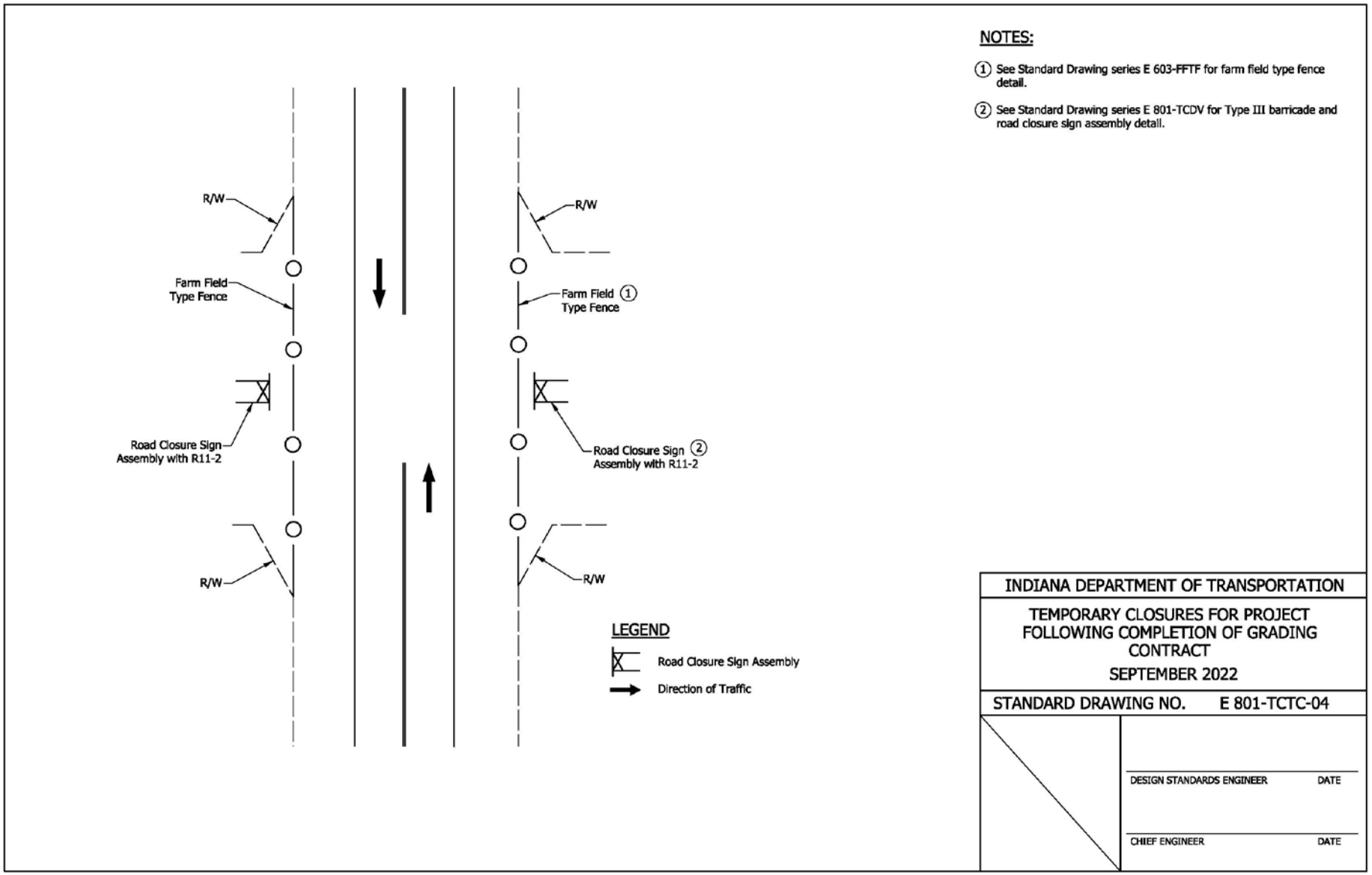
STANDARD DRAWING NO. E 801-TCTC-03

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed revised draft)



COMMENTS AND ACTION

107.12 Traffic Control Devices
801.08 Cones and Tubular Markers
801.18 Basis of Payment
E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed draft)

DISCUSSION:

Mr. Boruff introduced and presented this item proposing to revise and update the standard drawing series on temporary traffic control devices (E 801-TCDV), lane closures (E 801-TCLC), shoulder closures (E 801-TCSC), and temporary closures (E 801-TCTC). Mr. Boruff also proposed to create a RSP for the changes to the E 801-TCDV series and the basis of payment for continuous worksite speed limit assemblies and delete the standard drawing series for temporary shoulders (E 801-TCTS), as explained on the proposal sheet.

Mr. Duncan, FHWA, stated that it seems like they omitted a word in their spec update. Section 107, the word "freeways" should possibly be added between "…merge tapers on" and "and 42 in. cones…" Mr. Boruff said that is a good catch, "freeway" should be inserted between the two phrases you've noted.
Mr. Duncan also said that, to avoid confusion, we, FHWA, propose changing the legend style for channelizing devices on Sheet 31 of 45, "shoulder closure on two lane highway with local access". The current depiction is the same as what is used for temporary traffic barrier which is concrete wall. Mr. Boruff responded that the incorrect symbol was used in the marked up set; a solid circle which is correct is used on the clean set.
Mr. Duncan further stated that on Sheet 32 of 45, the leading end of the temporary barrier at the access break requires an end treatment. Mr. Boruff replied that in the clean set, the end treatment is specified at the leading edge of the access break, this should have been noted on the mark ups.

Mr. Koch stated that with INTERSTATE being struck and keywording, the SS revels one other use of the word FREEWAY; Are we intending to limit the application to just freeways or is the term intended to be general? The standard drawing includes references to both and expressway. And, does the word 'EFFECTIVE' lane width create confusion? Mr. Boruff agreed and the words "…interstates and" have been added to the language so it now reads "…interstates and freeways…".

With regard to drawing 801-tcdv-04, Mr. Koch asked if in order to reinforce a new concept, should the table header be revised to include the less than 10 ft effective lane width language? Mr. Boruff concurred with this and stated that the wording in the column headers currently referring to "where space is limited" should be changed to "where the effective lane width is less than 10 ft."
Mr. Boruff also suggested further editorial revisions to the drawings to be in accordance with proper specification language format, along with clarifications as follows:

TCDV-01, add definitions of long, intermediate, and short-term work durations; note 1: add permanent to describe posted speed limit, note 3; change "meet" to "satisfy" NCHRP 350 or MASH,

TCDV-02, note 5, add "permanent" to posted speed limit.

TCDV-05, note 1; change "meet" to "satisfy" NCHRP 350 or MASH, note 3: change must to shall

TCDV-06, note 6: change must to shall

TCDV-07, note 3; change "meet" to "satisfy" NCHRP 350 or MASH

TCDV-08, note 4; change "meet" to "satisfy" NCHRP 350 or MASH

TCDV-11, note 4: add "permanent" to posted speed limit, change "in" the plans to "on" the plans

TCLC-02, -03, -04, -05, -06, -07, -08, -09, -10, the longitudinal buffer space needs to be shown in advance of the shadow vehicle rather than the shadow vehicle being within it.

TCLC-02 & TCLC-05, an additional sentence should be added to the note on the downstream taper: "The downstream taper may be omitted if necessary for work vehicle access".

COMMENTS AND ACTION

107.12 Traffic Control Devices
801.08 Cones and Tubular Markers
801.18 Basis of Payment
E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed draft)

TCLC-04, -07, -09, the merge taper should be 980 ft (14' of merge width x 70 mph)

TCLC-08, an arrow board is needed at the second lane merge

TCLC-11, a shoulder closure taper and longitudinal buffer space should be added in advance of the barrier wall.

TCLC-12, the "Lane Closed" signs should be moved behind the channelizing devices inside the closed off area.

TCSC-04, note 1, the time period should be 14 days rather than 3.

Mr. Koch mentioned that 801-tcdv-02 does not seem to follow the MUTCD. Note #8 could be read as taller devices/markers require both W and FO reflectorization even for night-time work yet the MUTCD would require additional W reflectorization. Usually, tubular marker set-ups are 24-7 so although we may not have actual night work the public will still be present, is incorporation of FO appropriate?
Mr. Boruff responded that the fluorescent orange sheeting needs to be removed from the tubular marker detail, and a detail depicting effective lane width will be added.

Ms. Smutzer asked for a minor revision to TCSC-03 and -05. Mr. Boruff concurred.

Mr. Boruff revised his motion. There was no further discussion and this item passed as revised.

COMMENTS AND ACTION

107.12 Traffic Control Devices
801.08 Cones and Tubular Markers
801.18 Basis of Payment
E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC series (proposed draft)

[CONTINUED]

Motion: Mr. Boruff Second: Mr. Reilman Ayes: 10 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted X Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 107 pg. 76. 801.08 pg. 869. 801.18 pg. 884 - 887. Recurring Special Provision references: 801-T-232 TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS Standard Drawing affected: *see* Proposal for this item. Design Manual Sections affected: 503-7.0 GIFE Sections cross-references: 2.8	X 2024 Standard Specifications X Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: X Revise RSP (No. 801-T-232) Effective: September 1, 2022 RSP Sunset Date: 2024 SS book X Standard Drawing E 801-TCDV, E 801-TCLC, E 801-TCSC, E 801-TCTC, E 801-TCTS Effective: September 1, 2022 ___ Create RPD (No. ___) Effective: X GIFE Update ___ Frequency Manual Update ___ SiteManager Update

Mr. Novak
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The industry is beginning to implement electronic ticketing. In order to stay current INDOT will need to update specification language to allow for both paper tickets and electronic tickets (e-tickets). Numerous systems have appeared creating a varied experience for inspection staff. To date, INDOT has currently been operating under a Memorandum. A specification would provide clarity to industry about the direction of e-ticketing at INDOT.

In addition, there are portions of the spec sections being revised that include out of date requirements. These include material records requirements that have not been updated in the years since the system management changed from CRA to Site Manager. There are also references to automatic printer systems and state weighman that are no longer part of the current construction management processes.

PROPOSED SOLUTION: Revise the spec language to allow for both ticketing options: e-tickets or paper tickets. The required ticket information will remain the same regardless of the option selected. Add language for minimum functionality for e-ticketing systems in order to provide a sufficient and consistent experience for inspection staff. Both options will likely be needed for the foreseeable future until all material suppliers in the state use e-ticket systems and all areas of the state have consistent cellular coverage.

In addition, delete language that is out of date.

APPLICABLE STANDARD SPECIFICATIONS: 106.01(b), 109.01(b)

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: Primarily 13.19, but may need to consider a new e-ticket section

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: APAI subcommittee on e-Ticketing; vetted for comment with ICI and ACPA.

[continued]

Mr. Novak
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:

IMPACT ANALYSIS (attach report):

Submitted By: Joe Novak

Title: State Construction Engineer

Organization: INDOT

Phone Number: 317-501-7805

Date:

Mr. Novak
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Approved Materials List? No
Will this proposal improve:

Construction costs? Yes
Construction time? Yes
Customer satisfaction? Yes
Congestion/travel time? No
Ride quality? No

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? No
For construction workers? Yes

Will this proposal improve quality for:

Construction procedures/processes? Yes
Asset preservation? No
Design process? No

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? No

Is this proposal needed for compliance with:

Federal or State regulations? No
AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: N/A

REVISION TO STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL
106.01(b) Material Records
SECTION 109 – MEASUREMENT AND PAYMENT
109.01(b) Scales and Measurement by Weight (Mass)

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 106, BEGIN LINE 50, DELETE AND INSERT AS FOLLOWS:

(b) Material Records

The Engineer will prepare the material record from the documentation provided by the Contractor. ~~The Engineer will submit the completed forms to the Contractor by the end of the fifth business day of each month for the preceding month. The Contractor shall distribute this information to the appropriate subcontractors as required. The Contractor shall review, sign, and return the material record to the Engineer by the 28th day of each month, along with documentation to support the Contractor's recommended adjustments to the record.~~

1. Documentation of Material Delivery

The Contractor shall provide a copy of each delivery ticket and certifications, if required, to the Engineer not later than the next business day *except as specified hereina~~fter~~*. If providing this information on the next business day is not possible, the Contractor and the Engineer will agree upon other arrangements for the receipt of the necessary documentation prior to the event.

2. Delivery Ticket Information

The material delivery ticket shall include an itemized quantity of all materials delivered, the date of delivery, and the contract number. The material delivery ticket shall document the source of supply and source code, if known, and shall contain information necessary to obtain a basis for use as required by Department specifications. *The material delivery ticket may be either a paper ticket or an electronic ticket, ~~(e-ticket)~~.*

When e-tickets are to be supplied, the Contractor shall either be approved to use the Department's e-ticketing system or request approval of the Engineer to use an alternate e-ticketing system. The approval of an alternate e-ticketing system shall warrant the following minimum requirements:

a. *The Contractor shall ~~P~~provide a user guide document and answer questions as needed.*

b. *The Contractor shall ~~P~~provide the Department access to the e-ticket data in real-time via software compatible with both Apple macOS and Microsoft Windows desktop operating systems and both Apple iOS and Google Android mobile operating systems.*

c. The Contractor shall ~~P~~provide the Department the ability to acknowledge the acceptance of e-tickets within both the desktop and the mobile systems.

d. The s~~S~~ystem shall compile e-tickets into a single PDF format document by date and material description with the number of tickets per page limited to maintain legibility; and compile a PDF format e-ticket summary by date and material description with the total quantity delivered. E-tickets and summaries shall include acceptance status input by the Department.

e. The Contractor shall ~~P~~provide ~~Department~~ software access to the Department for direct download of all e-tickets and summaries, or in the absence of such access, the Contractor shall be responsible for emailing the required documents.

f. The Department may request paper tickets at any time due to system failures, cellular connectivity failures, or lack of reliability due to inaccuracy or inconsistency of the data provided.

All required certifications shall be in accordance with 916 or as directed.

3. Payment Procedures

If the Contractor does not provide the necessary documentation for the materials, such materials will not be paid for. The Engineer will notify the Contractor of those materials held from the estimate with the justification for withholding payment. If corrective action has not been taken within six weeks of the materials delivery to the project site, the entire estimate payment may be withheld.

SECTION 109, BEGIN LINE 73, DELETE AND INSERT AS FOLLOWS:

(b) Scales and Measurement by Weight (Mass)

All materials for which measurements are obtained by weight (mass) shall be weighed on approved scales which, except as hereinafter provided for out-of-state scales, shall be tested and sealed by the Indiana State Board of Health, Division of Weight and Measures. This inspection shall have been made within a period of not more than one year prior to the date of use for weighing material. A scale which has been tested and approved within this one year period and which has been repaired or dismantled or moved to another location, shall again be tested and approved before it is eligible for weighing. All interested parties, such as the Department, the Contractor, or the owner of the scales, may request an

inspection of the scales in question. The latest inspection shall take precedence over all previous inspections. ~~Automatic printer systems may be used with HMA plant scale systems under certain conditions in accordance with 409.02(a). If automatic printer systems are used, the same inspection, testing, and sealing requirement specified herein for scales shall apply to HMA plant batch scales and printer systems.~~

A motor-truck scale shall have a suitable undercarriage of such construction that shall safely carry and weigh an amount equal to 80% of the rated capacity of the scale on either end of the scale platform. When so loaded, the stresses in the lever system shall not exceed the stresses allowable under AREA specifications. The load carried per 1 in. of knife-edged bearing shall not exceed 5,000 lb.

The scale platform shall be of such length and width as to conveniently accommodate all trucks containing materials which need to be weighed. The entire truck load shall rest on the scale platform and shall be weighed as one draft.

If material is weighed on truck scales, weigh tickets showing the net weight of each load of material delivered shall be supplied for use in computing quantities. The tickets ~~shall be prepared at the weighing site under the supervision of the State weighman, and~~ shall contain the ticket serial number, date, contract number, source of supply, material designation such as size or type, DMF or JMF number for HMA, truck number, time weighed, gross weight direct reading if scale is of the direct reading type, tare, net weight, and moisture content if applicable. ~~Two~~ ~~s~~Spaces shall be provided on each ticket for *the* signature~~s~~ of *a* representatives of the Engineer. ~~One space shall be designated for the state weighman and the second space for the technician or inspector.~~

A duplicate ticket may be furnished by the Contractor for its records. The original, and duplicate if furnished, tickets will be signed ~~at the weighing site and~~ at the point of incorporation into the work. No additional payment will be made for furnishing, maintaining, and operating scales.

The weight of materials weighed outside the State and intended for use on the contract may be determined on scales tested and approved by the proper governmental unit having authority where the scales are located. In such case, the Department shall be furnished with a certified copy of such inspection and approval which, to be acceptable, shall have been made within one year to the time of such weighing. Out-of-state truck scales used shall be in accordance with all pertinent provisions as they apply to truck scales accepted within the State of Indiana. They shall be subject to approval and inspection by the Department and to the requirements applicable to such scales located within the State.

If materials are shipped by rail, the car weight may be accepted provided payment is made for only the actual weight of the materials. Car weights will not be acceptable for

REVISION TO STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL
106.01(b) Material Records
SECTION 109 – MEASUREMENT AND PAYMENT
109.01(b) Scales and Measurement by Weight (Mass)

material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as directed. Each truck shall bear a plainly legible identification mark.

COMMENTS AND ACTION

106.01(b) Material Records
109.01(b) Scales and Measurement by Weight (Mass)

DISCUSSION:

This item was introduced and presented by Mr. Novak who, for the reasons stated on the proposal sheet, proposed to revise the spec language to allow for both ticketing options: e-tickets or paper tickets. The required ticket information will remain the same regardless of the option selected. Mr. Novak also proposed to add language for minimum functionality for e-ticketing systems in order to provide a sufficient and consistent experience for inspection staff. Both options will likely be needed for the foreseeable future until all material suppliers in the state use e-ticket systems and all areas of the state have consistent cellular coverage. Mr. Novak also proposed to delete language that is out of date.

Minor editorial revisions are as shown. Mr. Novak stated that the Basis For Use will be for all contracts.

There was no further discussion and this item passed as submitted.

Motion: Mr. Novak Second: Mr. Koch Ayes: 10 Nays: 0 FHWA Approval: YES	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 106 begin pg 61; 109 begin pg 99. Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: 13.19	X 2024 Standard Specifications ___ Revise Pay Items List X Create RSP (No. 106-C-274) Effective: September 1, 2022 RSP Sunset Date: 2024 SS book ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: X GIFE Update ___ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:
Standard Drawings Series E 609-RCBA and E 503-BATJ do not reflect the revisions stated in Design MEMO 21-22 dated September 14, 2021, as stated below:

RSP 214-R-733 Geosynthetics was approved at the May 20, 2021, Standards Committee meeting. The RSP revises Standard Specifications Sections 214.02, 214.03(c), 214.03(d), 214.04, 214.05, and 214.06, including the deletion of Pay Item "Geotextile for Subgrade, _____". Further revisions were approved at the September 16, 2021, Standards Committee meeting. The revisions to the basis of payment clarified that geotextile for subgrade and geotextile for embankment will be paid for as geotextile for pavement, for the type specified (i.e. Type 1A, 1B, 2A or 2B). Effective as noted, Geotextile for Subgrade, Type 2B as shown in Standard Drawings series E 609-RCBA and E 503-BATJ should be quantified and paid for as Geotextile for Pavement, Type 2B. Revisions will be incorporated into these Standard Drawings via a recurring plan detail, until they are incorporated into the 2022 INDOT Standard Drawings. Pavement Sections for Driveway Standard Drawings need updating.

PROPOSED SOLUTION: Revise Standard Drawings E 609-RCBA-04, E 503-BATJ-02 and E 503-BATJ-03

APPLICABLE STANDARD SPECIFICATIONS: 214-R-733 (no changes required)

APPLICABLE STANDARD DRAWINGS: E 609-RCBA-04, E 503-BATJ-02, E 503-BATJ-03

APPLICABLE DESIGN MANUAL SECTION: 17-5.09(01) and 17-5.09(02) [no change needed]

APPLICABLE SECTION OF GIFE: no

APPLICABLE RECURRING SPECIAL PROVISIONS: no

PAY ITEMS AFFECTED: no

APPLICABLE SUB-COMMITTEE ENDORSEMENT: none

IMPACT ANALYSIS (attach report): yes
Submitted By: Mark Orton
Title: Standards Engineer, Office of Standards and Policy
Organization: Standards and Policy Division
Phone Number: 317-233-3840
Date: 3-09-22

Mr. Orton
Date: 3/17/22

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD DRAWINGS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? no

Will approval of this item affect the Approved Materials List? no

Will this proposal improve:

Construction costs? no
Construction time? no
Customer satisfaction? no
Congestion/travel time? no
Ride quality? no

Will this proposal reduce operational costs or maintenance effort? no

Will this item improve safety:

For motorists? no
For construction workers? no

Will this proposal improve quality for:

Construction procedures/processes? no
Asset preservation? no
Design process? no

Will this change provide the contractor more flexibility? no

Will this proposal provide clarification for the Contractor and field personnel? yes

Can this item improve/reduce the number of potential change orders? yes

Is this proposal needed for compliance with:

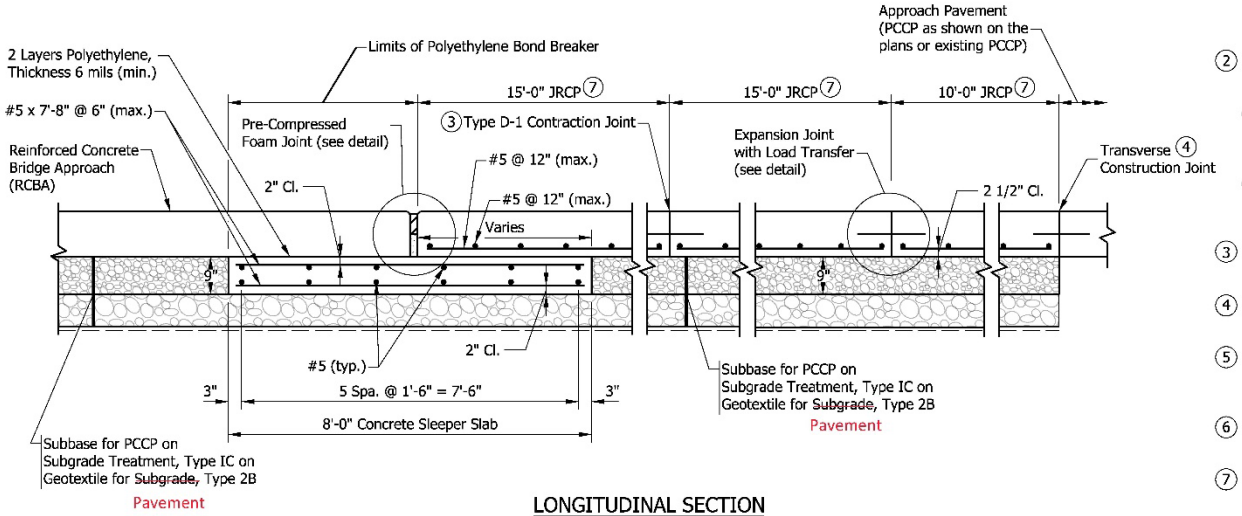
Federal or State regulations? no
AASHTO or other design code? no

Is this item editorial? yes

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: This submittal is to update applicable standard drawings to be consistent with Design Memo 21-22 and RSP 214-R-733.

REVISION TO STANDARD DRAWINGS

E 503-BATJ-02 TERMINAL JOINT, TYPE PCCP (with markups)



LONGITUDINAL SECTION

NOTES:

(1) The joint opening width shall be 2.5 in. for expansion lengths of 150 ft or less, regardless of the joint setting temperature. For expansion lengths greater than 150 ft, the joint opening width shall be constructed based on the actual ambient temperature at the time of construction with the manufacturer's joint setting table. The expansion length shall be as shown on the plans.

(2) The precompressed foam joint shall be able to accomodate both the minimum and maximum joint opening widths as shown below.

- Expansion length 250 ft or less
  W(min.)=1.3 in.
  W(max.)=3.7 in.
- Expansion length greater than 250 ft and less than 400 ft.
  W(min.)=1.0 in.
  W(max.)=4.0 in.

(3) See Standard Drawing E 503-CCPJ-02 for type D-1 contraction joint details.

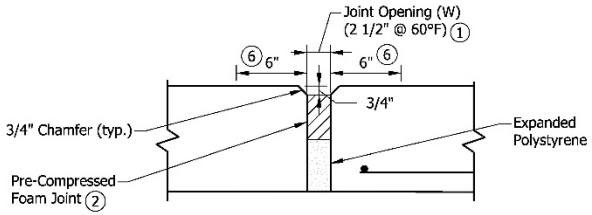
(4) See Standard Drawing E 503-CCPJ-03 for transverse construction joint details.

(5) Expansion cap shall be placed with an air gap of 1/4 in. min. between end of dowel bar and end of cap. Expansion caps shall be placed on alternating end of the dowel bar.

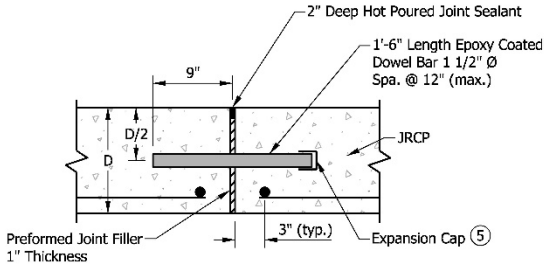
(6) Tining or grooving of the concrete shall be terminated 6 in. in advance of the joint opening.

(7) Jointed Reinforced Concrete Pavement (JRCP) thickness shall match the thickness of reinforced concrete bridge approach.

8. Underdrains shall be constucted when shown on the plans.



PRE-COMPRESSED FOAM JOINT DETAIL



EXPANSION JOINT WITH LOAD TRANSFER DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION

TERMINAL JOINT, TYPE PCCP

SEPTEMBER 2020

STANDARD DRAWING NO. E 503-BATJ-02

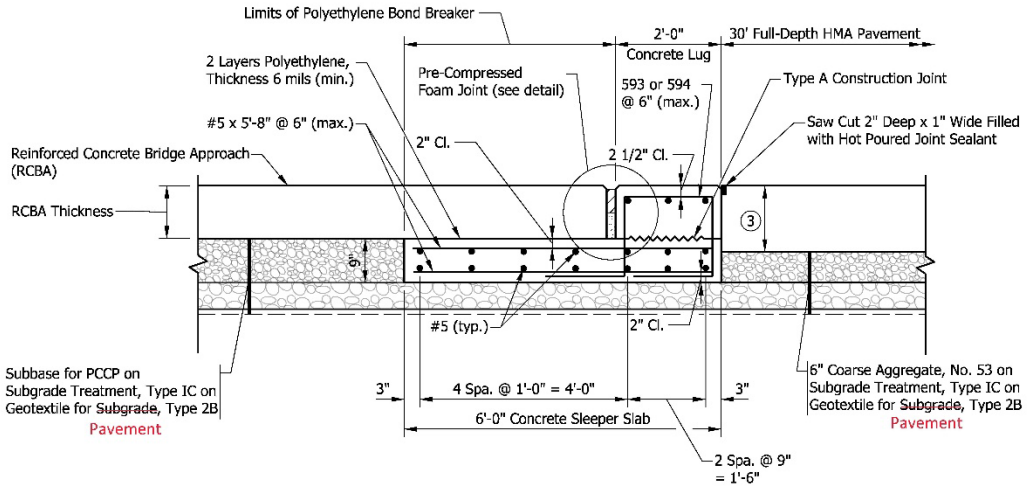
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

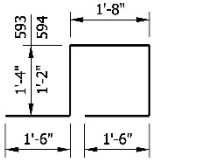
04/02/20
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

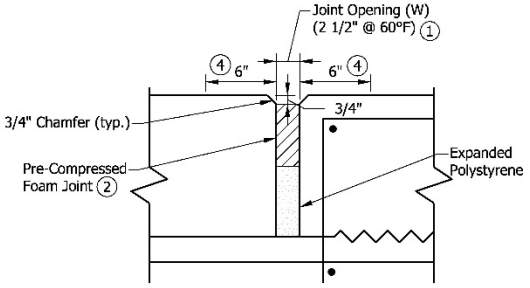
E 503-BATJ-02 TERMINAL JOINT, TYPE HMA (with markups)



LONGITUDINAL SECTION



593 x 7'-4" (for 12" RCBA)
594 x 7'-0" (for 10" RCBA)



PRE-COMPRESSED FOAM JOINT DETAIL

NOTES:

1. The joint opening width shall be 2.5 in. for expansion lengths of 150 ft or less, regardless of the joint setting temperature. For expansion lengths greater than 150 ft, the joint opening width shall be constructed based on the actual ambient temperature at the time of construction with the manufacturer's joint setting table. The expansion length shall be as shown on the plans.
2. The precompressed foam joint shall be able to accomodate both the minimum and maximum joint opening widths as shown below.
   - Expansion length 250 ft or less
     W(min.)=1.3 in.
     W(max.)=3.7 in.
   - Expansion length greater than 250 ft and less than 400 ft
     W(min.)=1.0 in.
     W(max.)=4.0 in.
3. Pavement section to be shown on the plans.
   Minimum Thickness:
   - 15 in. HMA for 12 in. RCBA
   - 13 in. HMA for 10 in. RCBA
4. Tining or grooving of the concrete shall be terminated 6 in. in advance of the joint opening.

INDIANA DEPARTMENT OF TRANSPORTATION

TERMINAL JOINT, TYPE HMA

SEPTEMBER 2020

STANDARD DRAWING NO. E 503-BATJ-03

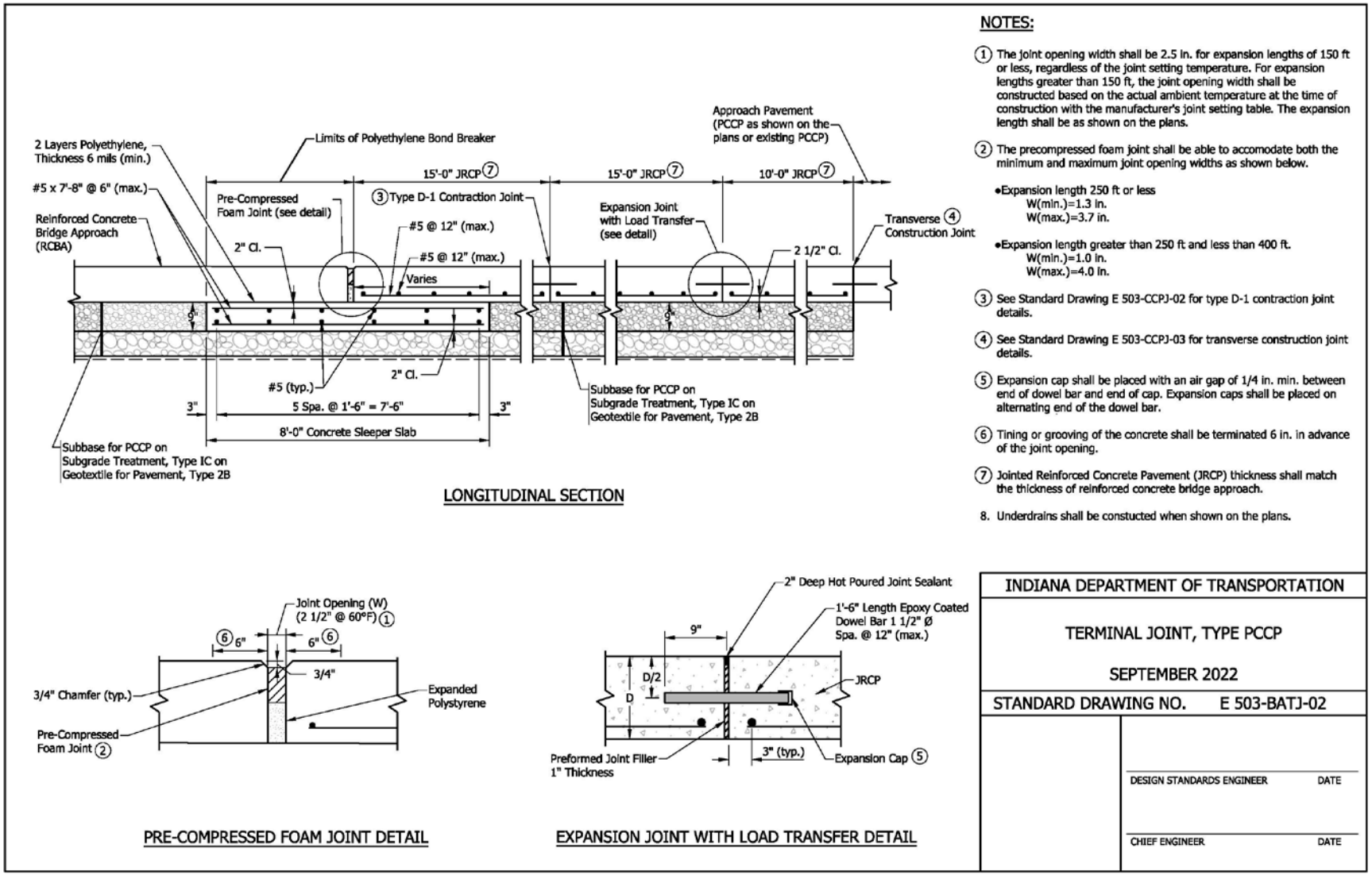
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

04/02/20
CHIEF ENGINEER DATE

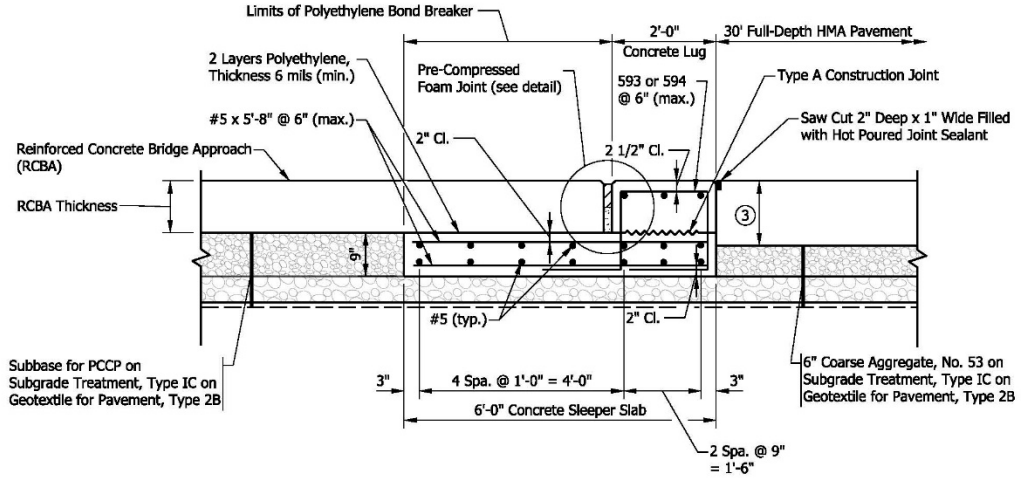
REVISION TO STANDARD DRAWINGS

E 503-BATJ-02 TERMINAL JOINT, TYPE PCCP (proposed draft)

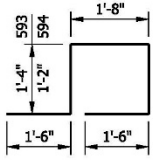


REVISION TO STANDARD DRAWINGS

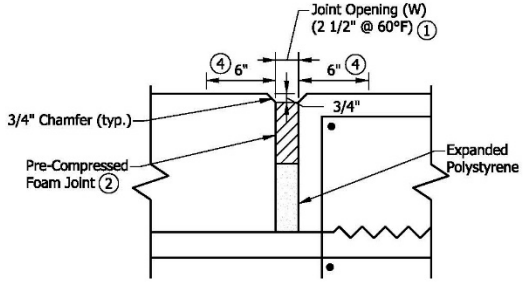
E 503-BATJ-03 TERMINAL JOINT, TYPE HMA (proposed draft)



LONGITUDINAL SECTION



593 x 7'-4" (for 12" RCBA)
594 x 7'-0" (for 10" RCBA)



PRE-COMPRESSED FOAM JOINT DETAIL

NOTES:

1. The joint opening width shall be 2.5 in. for expansion lengths of 150 ft or less, regardless of the joint setting temperature. For expansion lengths greater than 150 ft, the joint opening width shall be constructed based on the actual ambient temperature at the time of construction with the manufacturer's joint setting table. The expansion length shall be as shown on the plans.
2. The precompressed foam joint shall be able to accomodate both the minimum and maximum joint opening widths as shown below.
   - Expansion length 250 ft or less
     W(min.)=1.3 in.
     W(max.)=3.7 in.
   - Expansion length greater than 250 ft and less than 400 ft
     W(min.)=1.0 in.
     W(max.)=4.0 in.
3. Pavement section to be shown on the plans.
   Minimum Thickness:
   - 15 in. HMA for 12 in. RCBA
   - 13 in. HMA for 10 in. RCBA
4. Tining or grooving of the concrete shall be terminated 6 in. in advance of the joint opening.

INDIANA DEPARTMENT OF TRANSPORTATION

TERMINAL JOINT, TYPE HMA

SEPTEMBER 2022

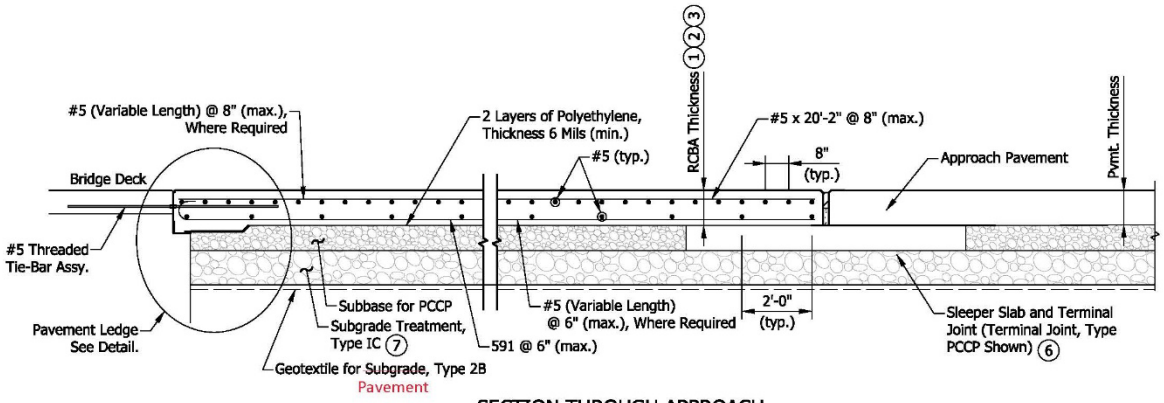
STANDARD DRAWING NO. E 503-BATJ-03

DESIGN STANDARDS ENGINEER DATE

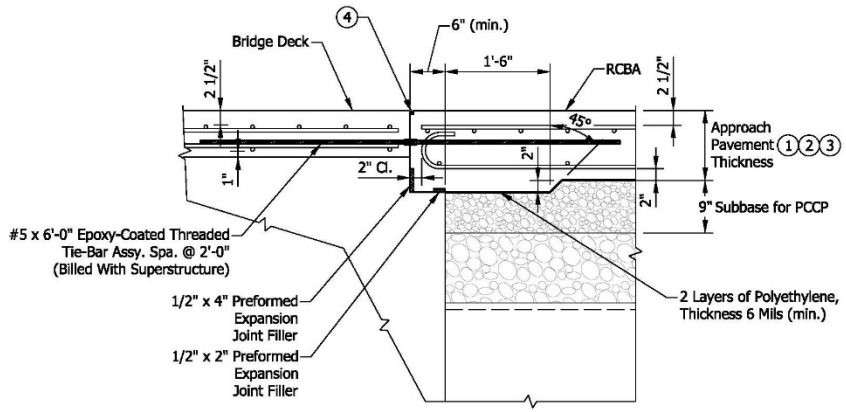
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH - SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS (with markups)



SECTION THROUGH APPROACH



PAVEMENT LEDGE DETAIL

NOTES:

(1) See plans for approach pavement thickness.

(2) For HMA approach pavement:
RCBA = 10 in. if design year AADT < 1000
RCBA = 12 in. if design year AADT ≥ 1000

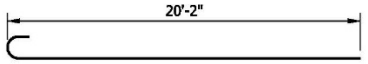
(3) For PCCP approach pavement:
RCBA = 12 in. if pavement thickness < 12 in.
RCBA = Same as pavement thickness, if pavement thickness ≥ 12 in.

(4) See Standard Drawing series E 609-BRJT for joint type I-A details.

5. See Standard Drawing series E 703-BRST for reinforcing-bar bending details and notes.

(6) When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.

(7) When the RCBA is constructed without a terminal joint, subgrade treatment shall be omitted and geotextile shall be placed under subbase for PCCP.



591 x 20'-9"

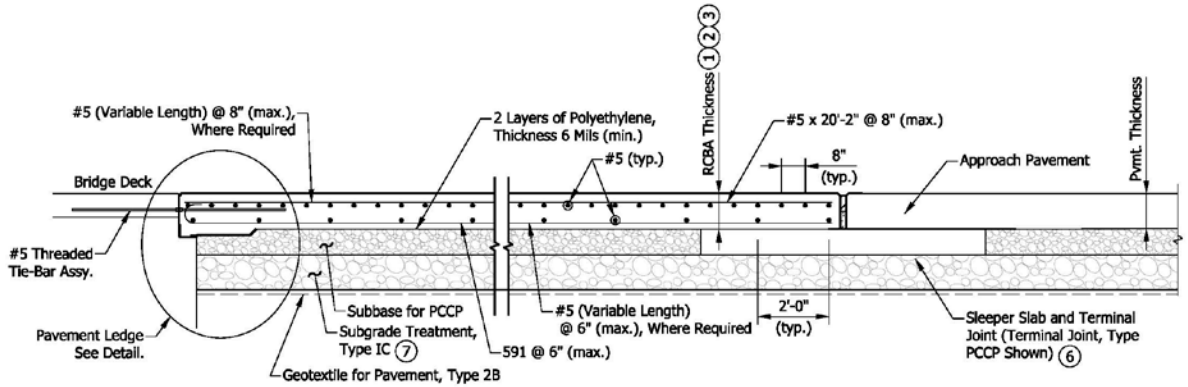
KEY:

RCBA = Reinforced Concrete Bridge Approach

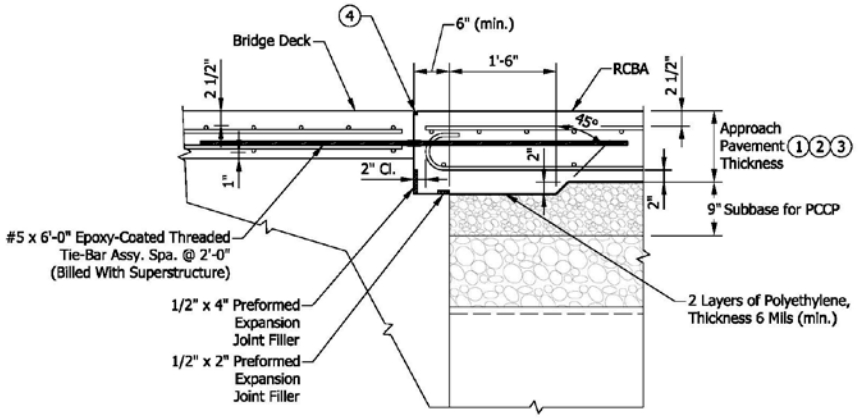
INDIANA DEPARTMENT OF TRANSPORTATION	
REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS SEPTEMBER 2021	
STANDARD DRAWING NO. E 609-RCBA-04	
ELIZABETH P. MOUSER REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER	3/18/21 DESIGN STANDARDS ENGINEER DATE 3/24/2021 CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH - SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS (proposed draft)



SECTION THROUGH APPROACH



PAVEMENT LEDGE DETAIL

NOTES:

(1) See plans for approach pavement thickness.

(2) For HMA approach pavement:
RCBA = 10 in. if design year AADT < 1000
RCBA = 12 in. if design year AADT ≥ 1000

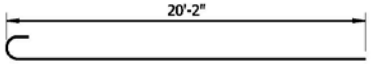
(3) For PCCP approach pavement:
RCBA = 12 in. if pavement thickness < 12 in.
RCBA = Same as pavement thickness, if pavement thickness ≥ 12 in.

(4) See Standard Drawing series E 609-BRJT for joint type I-A details.

5. See Standard Drawing series E 703-BRST for reinforcing-bar bending details and notes.

(6) When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.

(7) When the RCBA is constructed without a terminal joint, subgrade treatment shall be omitted and geotextile shall be placed under subbase for PCCP.



591 x 20'-9"

KEY:

RCBA = Reinforced Concrete Bridge Approach

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS
SEPTEMBER 2022

STANDARD DRAWING NO. E 609-RCBA-04

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

COMMENTS AND ACTION

E 503-BATJ-02 and -03
E 609-RCBA-04

DISCUSSION:
This item was introduced and presented by Mr. Orton who explained that Standard Drawings Series E 609-RCBA and E 503-BATJ do not reflect the revisions stated in Design MEMO 21-22 dated September 14, 2021.

Mr. Orton proposed to revise Standard Drawings E 609-RCBA-04, E 503-BATJ-02 and E 503-BATJ-03, as shown.

Mr. Dave asked if this revision is proposed to be in alignment with current spec language? Mr. Orton said that yes it is.

There was no further discussion and this item passed as submitted.

Motion: Mr. Orton Second: Mr. Boruff Ayes: 10 Nays: 0 FHWA Approval: YES	Action: _X_ Passed as Submitted ___ Passed as Revised ___ Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 214 begin pg. 241 Recurring Special Provision references in: 214-R-733 (no changes required) Standard Drawing affected: E 609-RCBA-04, E 503-BATJ-02 and E 503-BATJ-03 Design Manual Sections affected: 17-5.09(01) and 17-5.09(02) [no change needed] GIFE Sections cross-references: NONE	___ 2024 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: _X_ Standard Drawing Effective: September 1, 2022 ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update