INDIANA DEPARTMENT OF TRANSPORTATION
Driving Indiana's Economic Growth

100 North Senate Avenue
Room N925
Indianapolis, Indiana 46204

PHONE: (317) 232-5502
FAX: (317) 234-5133

Mitchell E. Daniels, Jr., Governor
Michael B. Cline, Commissioner

AGENDA

April 19, 2012 Standards Committee Meeting

MEMORANDUM

April 04, 2012

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Agenda for the April 19, 2012 Standards Committee Meeting

A Standards Committee meeting is scheduled for 09:00 a.m. on April 19, 2012 in the N955 Bay Window Conference Room. Please enter meeting through the double doors directly in front of the conference room.

The following agenda items are listed for consideration.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Approval of the March 15, 2012 Minutes

2. Discontinuance of the standard drawings pertaining to the cantilever structures and related details:

802-SNCF -01;	802-SNOC -01;
802-SNFT -01;	802-SNOC -02;
802-SNFT -03;	802-SNOC -03;
802-SNIL -04;	802-SNOC -04;
802-SNIL -05;	802-SNOC -05.

3. Formation of the 800 and related 900 sections sub-committee

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. LWC in Prestressed Concrete Members — Mr. Strain — pg 04

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

OLD BUSINESS

Item No. 07 03/15/12 (2012 SS) — Mr. Boruff — pg 15

Recurring Special Provision:

805-T-169	TRAFFIC SIGNALS

Item No. 04 09/16/10 (2010 SS) — Mr. Boruff — pg 27

801.02	Materials
801.15(b)	Changeable Message Signs
801.17	Method of Measurement
801.18	Basis of Payment
923.05	Temporary Worksite Speed Limit Sign Assembly
923.06	Tubular Marker
923.07	Acceptance of Temporary Traffic Control Devices

NEW BUSINESS

Item No. 01 04/19/12 (2012 SS) — Mr. Strain — pg 61

714.02	Materials
714.03	General Requirements
714.04	Design Requirements
714.04(a)	Box Structure
714.04(b)	Concrete Headwalls, Wingwalls, and Footings
714.11	Method of Measurement
723.02	Materials
723.03	General Requirements
723.04	Design Requirements
723.17	Method of Measurement

Item No. 02 04/19/12 (2012 SS) — Mr. Boruff — pg 66

Standard Drawings:

808-MKPM-01	TRANSVERSE MARKINGS
808-MKPM-06	PAVEMENT MARKING DETAILS

Item No. 03 04/19/12 (2012 SS) — Mr. Strain — pg 71

609.13	Method of Measurement
609.14	Basis of Payment

Standard Drawings:

609-RCBA-01	REINFORCED CONCRETE BRIDGE APPROACH

	FOR USE WITH ASPHALT PVMT.
609-RCBA-02	REINFORCED CONCRETE BRIDGE APPROACH AND TERMINAL JOINT FOR USE WITH PCCP
609-RCBA-03	REINFORCED CONCRETE BRIDGE APPROACH
609-RCBA-04	REINFORCED CONCRETE BRIDGE APPROACH
609-RCBA-05	REINFORCED CONCRETE BRIDGE APPROACH
609-RCBA-06	REINFORCED CONCRETE BRIDGE APPROACH
609-RCBA-07	REINFORCED CONCRETE BRIDGE APPROACH

Item No. 04 04/19/12 (2012 SS) Mr. Boruff pg 91

Standard Drawing:

802-SNGS-05	SIGN REFLECTORIZATION SCHEDULE

Item No. 05 04/19/12 (2012 SS) Mr. Boruff pg 97

801.15(c)	Temporary Worksite Speed Limit Sign Assembly

Standard Drawings:

801-TCDV-10A	*WORKSITE SPEED LIMIT SIGN ASSEMBLY FOR INTERMITTENT USE*
801-TCDV-10B	*WORKSITE SPEED LIMIT SIGN ASSEMBLY*
801-TCDV-10	WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCDV-11	WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCSN-13	SIGN DESIGN DETAILS

Item No. 06 04/19/12 (2012 SS) Mr. Boruff pg 108

Standard Drawing:

809-ICCF-01	*ITS CONTROLLER CABINET FOUNDATION VWIM*

Item No. 07 04/19/12 (2012 SS) Mr. Pankow pg 111

Recurring Special Provisions:

205-X-XXX	*TEMPORARY EROSION AND SEDIMENT CONTROL*
108-C-192	TEMPORARY EROSION CONTROL MEASURES

Standard Drawings:

205-TECD-01	TEMPORARY CHECK DAM, REVETMENT RIPRAP
205-TECD-02	TEMPORARY CHECK DAM, TRAVERSABLE FOR CLEAR ZONE
205-TECD-04	TEMPORARY SEDIMENT TRAP
205-TECP-02	TEMPORARY SILT FENCE

cc: Committee Members (11)
FHWA (3)
ICA (1)

Mr. Strain
Date: 04/19/12

CONCEPTUAL PROPOSAL ITEM

SEMI-LIGHTWEIGHT CONCRETE IN PRESTRESSED CONCRETE MEMBERS

CONCEPTUAL

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT has used a semi-lightweight concrete in prestressed concrete members for several years. We were the only department of transportation to use a semi-lightweight concrete. The unit weight of the concrete varied from 120 lbs per cu. ft. to 130 lbs per cu. ft. and often the designer would specify a unit weight for design and then neglect to include the weight of the steel in the design. In many instances, the actual weight of the concrete member was heavier than what was actually designed.

PROPOSED SOLUTION: INDOT now has a unique special provision for the use of lightweight concrete. The provision gives the maximum equilibrium density that must be met. The proposed change to the design manual replaces the portions of the manual that pertain to semi-lightweight concrete with lightweight concrete and instructs the designer on what density to use for the equilibrium density as well as the unit weight of the concrete for design purposes.

APPLICABLE STANDARD SPECIFICATIONS: This provision will not affect the Standard Specifications

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: Chapter 406 Prestressed-Concrete Structure

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS: Provision will remain a unique provision until performance is assured.

PAY ITEMS AFFECTED: none

Submitted By: Randy Strain

Title: Bridge Standard and Procedure Engineer

Organization: INDOT

Phone Number: 317-232-3339

Date: 3-26-12

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ASCE Structural Committee has been solicited for comment and review.

UNIQUE SPECIAL PROVISION: SEMI-LIGHTWEIGHT CONCRETE, CLASS LW (DRAFT)

LIGHTWEIGHT CONCRETE, CLASS LW

Description

This work shall be in accordance with 707.01 except that lightweight concrete, class LW, shall be used in the manufacture of precast concrete structural members.

Materials

Materials shall be in accordance with 707.02 and 707.04(c), except as otherwise specified herein.

(a) Lightweight Coarse Aggregate

The lightweight coarse aggregate shall be an expanded shale or slate in accordance with ASTM C 330 and the requirements herein. The source of lightweight coarse aggregate shall be subject to approval of the Engineer. Lightweight aggregate shall be class A quality as defined in 904.03 except as follows:

1. Clay lumps and friable particles shall not exceed 2% by dry mass.
2. Los Angeles Abrasion shall be 50% maximum.

Requirements for decant, absorption, and non-durable particles will not apply.

The test concrete shall consist of a sand-lightweight aggregate. Resistance to freezing and thawing of the test concrete is not required.

The source of lightweight coarse aggregate shall provide a type B certification with each shipment to a Department Certified Precast Prestressed Concrete Producer. A copy shall be provided to the Engineer upon request.

The density factor of the lightweight course aggregate shall be determined at various absorbed moisture contents representing the full range of conditions encountered during production of class LW concrete as referenced in ACI 211.2. A plot of this relationship shall be provided with the type B certification in accordance with 916.

(b) Class LW Concrete Mix Design

The concrete for the prestressed structural member shall be designed and proportioned to satisfy the requirements described herein. The design shall be by the absolute volume method and submitted to the District Testing Engineer a minimum of 14 days prior to the trial batch. The mix design shall be in a format acceptable to the District Testing Engineer. The mix design shall include the following:

1. List of all ingredients
2. Source of each material
3. Gradation of each aggregate
4. Fineness Modulus of the lightweight coarse aggregate*
5. Dry loose bulk density of the lightweight coarse aggregate*

6. Absorption of each aggregate
7. The SSD bulk specific gravity of the fine aggregate
8. The Density Factor of the lightweight coarse aggregate
9. The Specific Gravity of each cementitious material used
10. Batch weight of each material to make 27 cu ft of Class LW concrete
11. Names of all admixtures
12. Range of dosage for each admixture as recommended by the manufacturer

*Values established at the time of the trial batch.

The proportioning of the class LW concrete shall be in accordance with the applicable portions of 707.04(c). However, the maximum total allowable cementitious content shall be 860 lb/cu yd. Silica fume may be added up to an amount not exceeding 6.5% of the total cementitious material. The fine aggregate shall not be less than 35% or more than 45% of the total volume of aggregates specified in the mix design.

(c) Class LW Concrete Mix Criteria

The class LW concrete mix design shall produce workable air entrained concrete mixture in accordance with the applicable requirements of 707.04(c) and the following properties.

1. The minimum compressive strength at time of prestressing shall be that shown on the plans.
2. The minimum compressive strength at 28 days shall be that shown on the plans.
3. The equilibrium density of the class LW concrete shall not exceed 119 lb/cu ft.

(d) Trial Batch

The girder manufacturer shall make trial batches as necessary to ensure that the mix design satisfies the requirements for entrained air, slump, plastic unit weight, relative yield, water/cement ratio, equilibrium density, oven dry density and compressive strength; prior to use. Each compressive strength requirement shall be determined based on the average of at least two 6 in. by 12 in. cylinders. All facilities and materials necessary to prepare and initially cure the cast cylinders shall be provided. The 28-day compressive strength of the trial batch concrete shall exceed the design value by the amount stated in ASTM C 94, Appendix X unless otherwise approved by the Engineer. The trial mixtures shall utilize the same materials stated in the mix design for use on the project. At least 1 trial batch, using the same mix proportions and satisfying all specification requirements, shall be made in the presence of the Engineer and will be tested before the mix design is approved. The relationship between plastic concrete unit weight, oven dry density, and equilibrium density shall be established for the purpose of QC during production. A report of the test results from the trial batch shall be submitted to the Engineer for review prior to use of the mix design in production.

A minimum of 3 cu yd of class LW concrete shall be batched at the approved facility for the trial batch. The class LW concrete shall be batched and mixed in accordance with the applicable requirements of 702.06 and 702.07, except the batching tolerance for the lightweight

coarse aggregate shall be ± 1%. If silica fume is used, the batching sequence shall be reviewed with the Engineer prior to the trial batch to ensure a method of adequate dispersion of the silica fume.

Prior to making the trial batch, the stockpile of lightweight coarse aggregate shall be soaked and drained. Maintaining the stockpile in a uniform moisture condition shall be in accordance with Construction Requirements section (a) Aggregate Saturation. The stockpile shall be protected from freezing temperatures as in accordance with 707.04(c)1. A stockpile sample of lightweight coarse aggregate will be tested for absorption prior to batching the concrete. The lightweight coarse aggregate will be sampled and tested to evaluate compliance with gradation and dry loose bulk density. These lightweight coarse aggregate properties will also be used to establish targets for uniformity of grading and uniformity of dry loose bulk density to evaluate acceptance of lightweight coarse aggregate in future class LW concrete production. The lightweight coarse aggregate will also be sampled and tested for wet loose bulk density and total moisture content for use in checking batch weights for future class LW production.

(e) Test Methods and Procedure

The following test methods and procedures apply to the Contractor's process control and Department acceptance.

1. Air Content .....ASTM C173
2. Compressive Strength .....ASTM C39
3. Density Factor and Absorbed Moisture, Lightweight Coarse Aggregate .....ACII 211.2*
4. Equilibrium and Oven Dry Density .....ASTM C 567
5. Making and Curing Specimens .....ASTM C31
6. Moisture Content of Aggregate .....ASTM C127
7. Sampling Fresh Concrete .....ASTM C172*
8. Sampling Stockpiles Aggregate .....ITM 207
9. Sieve Analysis of Aggregates .....ASTM C136*
10. Slump .....ASTM C143
11. Specific Gravity and Absorption, Fine Aggregate .....ASTM C 128*
12. Temperature of Concrete .....ASTM C1064
13. Unit Weight and Relative Yield .....ASTM C 138
14. Water-Cementitious ratio of Concrete .....ITM 403

*Exceptions to the ASTM specifications are as follows:

ASTM C 136. The exceptions for conducting a sieve analysis on aggregates are stated in 904.06.

ASTM C 128. The SSD bulk specific gravity shall be reported to the nearest 0.001 and the absorption reported to the nearest 0.01% point.

ACI 211.2. The Density Factor shall be reported to the nearest 0.001 and the absorption reported to the nearest 0.01 % point.

ASTM C 172. A sample of fresh concrete may be obtained from one portion of the load after at least 0.25 cu yd of concrete has been discharged.

Construction Requirements

Construction shall be in accordance with 707 except as otherwise specified herein.

(a) Aggregate Saturation

Stockpiles of lightweight coarse aggregates shall be continuously and uniformly sprinkled with water for a minimum of 10 h by means of a sprinkler system. The occurrence of a steady rain of comparable intensity will permit the turning off of the sprinkler system, as approved by the Engineer, until the rain ceases. At the end of the wetting period, or after the rain ceases, the stockpiles shall be allowed to drain for a period of 3 h immediately prior to use, unless otherwise determined by the Engineer. Manipulation of the lightweight coarse aggregate stockpiles may be necessary to assure uniform wetting and drainage. Transfer of the lightweight coarse aggregate to the storage bin in the plant shall be monitored and controlled to ensure that free water cannot drain down into the material in the lower portion within the bin and increase the water cementitious ratio for a batched load of lightweight concrete.

The class LW concrete shall be batched and mixed in accordance with the applicable requirements of 702.06 and 702.07, except the batching tolerance for the lightweight coarse aggregate shall be ± 1%.

(b) Acceptance Testing

As lightweight coarse aggregate is received and stockpiles constructed, the material shall be sampled and tested for uniformity of grading. The fineness modulus of the lightweight coarse aggregate shall not differ more than 7% from the value established at the time of the trial batch. The material shall also be sampled and tested for uniformity of the dry loose bulk density. The dry loose density of the material shall not differ more than 10% from the value established at the time of the trial batch. Aggregate that does not comply with these uniformities will be rejected, unless it can be demonstrated to the Engineer that the material will produce class LW concrete which satisfies the requirements herein.

The soaked and drained stockpile of lightweight coarse aggregate will be tested for wet loose bulk density, absorbed moisture, and total moisture prior to batching. These values shall be used in establishing or checking the target batch weight of the lightweight coarse aggregate.

The class LW concrete shall be tested in accordance with 707.04(c)3, and the Frequency Manual for Precast/Prestressed Concrete Members. Each series of tests on the class LW concrete sample shall include unit weight and relative yield. Cylinders shall be cast and tested for equilibrium density and oven dry density. The Contractor may substitute plastic unit weight and oven dry density in lieu of equilibrium density after the relationship has been established for the mix in use and as approved by the Engineer.

SEMI-LIGHTWEIGHT CONCRETE IN PRESTRESSED CONCRETE MEMBERS

UNIQUE SPECIAL PROVISION: SEMI-LIGHTWEIGHT CONCRETE, CLASS LW (DRAFT)

(c) Forms
Shall be in accordance with 707.05.

(d) Placing and Finishing Concrete
Shall be in accordance with 707.06.

(e) Removal of Forms and Curing
Shall be in accordance with 707.07.

(f) Handling and Shipping
Shall be in accordance with 707.08.

(g) Placing Structural Members
Shall be in accordance with 707.09.

Method of Measurement
This work will be measured in accordance with 707.11.

Basis of Payment
This work will be paid for in accordance with 707.12.

CHAPTER 406

PRESTRESSED CONCRETE

406-1.0 GENERAL

The requirements of this Chapter will apply to each bridge designed with normal or lightweight concrete reinforced with prestressed or post-tensioned strands. Partial prestressing is not permitted. The requirements described herein are based on a 28-day concrete strength, f'_c, of 4 to 10 ksi.

406-2.0 DEFINITIONS

See *LRFD* 5.2.

406-3.0 NOTATIONS

See *LRFD* 5.3.

406-4.0 MATERIAL PROPERTIES

406-4.01 General

The material properties cited herein are based on the construction materials specified in *LRFD* 5.4. The minimum acceptable properties and test procedures shall be specified in the contract documents.

406-4.02 Normal-Weight and Lightweight Concrete

The minimum f'_c for prestressed or post-tensioned concrete components shall be shown on the plans. Such a strength outside the range shown in Section 406-1.0 is not permitted without written approval of the Director of Bridges. For lightweight concrete, the air dry unit weight shall be shown on the plans as 119 lb/ft^3. The modulus of elasticity will calculated using the 119 lb/ft^3 value. The unit weight of the light weight concrete will be 124 lb/ft^3. The additional weight is to account for the mild reinforcing steel and the tensiong strands. See *LRFD* 5.4.2.2 for the coefficient of linear expansion.

The following will apply to concrete.

1. The design compressive strength of normal-weight and lightweight concrete at 28 days, f'_c, shall be in the range as follows:

   a. prestressed box beam: 5 to 7 ksi
   b. prestressed I-beam: 5 to 7 ksi
   c. prestressed bulb-tee beam: 6 to 8 ksi

   An exception to the range shown above will be allowed for a higher strength if the higher strength can be documented to be of significant benefit to the project, it can be effectively produced, and approval is obtained from the Director of Bridges.

2. At release of the prestressing strands, f'_c shall not be less than 4 ksi, and shall be determined during the beam design. The specified concrete compressive strength at release shall be rounded to the next higher 0.1 ksi.

406-4.02(01) Shrinkage and Creep

Losses due to shrinkage and creep, for other than than a segmentally-constructed bridge, that require a more-precise estimate including specific materials, structural dimensions, site conditions, construction methods, and age at various stages of erection, can be estimated by means of the methods specified in *LRFD* 5.4.2.3.2 and 5.4.2.3.3. Other acceptable methods are those described in the CEB-FIP 1978 / 1990 code. The annual average ambient relative humidity shall be taken as 70%.

406-4.02(02) Modulus of Elasticity, Poisson's Ratio, and Modulus of Rupture

The modulus of elasticity shall be calculated as specified in *LRFD* Eqn. 5.4.2.4-1. Poisson's ratio shall be taken as 0.2. See *LRFD* 5.4.2.6 for modulus-of-rupture values depending on whether the concrete is normal weight or lightweight, and whether the intended application is control of cracking, deflection, camber, or shear resistance.

406-4.03 Semi-Lightweight Concrete

The use of semi-lightweight concrete, with normal-weight sand mixed with lightweight coarse aggregate, is permitted with a specified equilibrium density between of 119 lb/ft^3. Other unit weights may be used if approved by the Director of Bridges. The use of semi-lightweight

concrete shall be demonstrated to be necessary and cost effective during the structure-size-and-type study.

The structural performance of this concrete is equal to that of normal-weight concrete. However, the potential problems that shall be addressed are the control of the water content in the lightweight aggregate and the frost-sensitivity of lightweight aggregate for a period of two weeks after casting. Consideration shall be given to using the mix-design procedures for lightweight concrete described in ACI 211.2.

The modulus of elasticity will be less than that for normal-weight concrete. Creep, shrinkage, and deflection shall be appropriately evaluated and accounted for if lightweight concrete is to be used. The formula shown in *LRFD* 5.4.2.6 shall be used in lieu of physical test values for modulus of rupture. The formula for sand-lightweight concrete shall be used for lightweight concrete.

406-4.04 Prestressing Steel

Prestressing strands shall be of the low-relaxation type with a minimum tensile strength of 270 ksi. Unless there is a reason to do otherwise, only the following three-strand diameters shall be used.

1. Nominal 3/8 in., $A_s = 0.085$ in^2, for use in a stay-in-place deck panel.

2. Nominal ½ in., $A_s = 0.167$ in^2, for use in an I, bulb-tee, or box beam, or post-tensioned member.

3. Nominal 0.6 in., $A_s = 0.217$ in^2, for use in a in a bulb-tee beam or post-tensioned member.

See *LRFD* Table 5.4.4.1-1 for values of yield strength, tensile strength, and modulus of elasticity of prestressing strands or bars.

Prestressing threadbars are used for grouted construction. If the bars are used for permanent non-grouted construction, the bars shall be epoxy coated.

406-4.05 Post-Tensioning Anchorage and Couplers

See *LRFD* 5.4.5 regarding the use of anchorages or couplers. Tendons, anchorages, end fittings, and couplers shall be protected against corrosion. If couplers are used to connect bars, they shall be enclosed in duct housings long enough to permit the necessary movement.

2. Indiana bulb-tee beams; and
3. Indiana composite and non-composite box beams.

To ensure that the structural system has an adequate level of redundancy, a minimum of four beam lines shall be used.

An alternative prestressed-concrete-beam section may be considered if its use can be justified. The use of a beam section not available through local producers will be more expensive if the forms must be purchased or rented for a small number of beams. One or more beam fabricators shall be contacted early in project development to determine the most practical and cost-effective alternative beam section for a specific site.

406-12.02(02) AASHTO I-Beam Type I, II, III, or IV

See Figures 406-13A through 406-13D for details and section properties. I-beam type IV shall not be used unless widening of an existing bridge is required. The 54-in.-depth beam shall be used for a new structure where this member depth and span length is required.

406-12.02(03) Indiana Bulb-Tee Beam

See Figures 406-14A through 406-14F, and 406-14M through 406-14R for details and section properties. For a long-span bridge, bulb-tee beams with a top-flange width of 60 in. shall be considered for improved stability during handling and transporting. Draped strands may be considered for use in a bulb-tee beam, but shall only be considered if tensile stresses in the top of the beam near its end are exceeded if using straight strands. The maximum allowable compressive strength, tensile strength, extent of strand debonding, and number of top strands shall be considered in evaluating the need for draped strands. If draped strands are used, the maximum allowable hold-down force per strand shall be 3.8 kip, with a maximum total hold-down force of 38 kip. For additional information on draped strands, see Section 406-12.03. lightweight concrete may be used for this type of beam if it is economically justified. See Section 406-4.03.

Prestressed-concrete bulb-tee members identified as wide bulb-tees have been approved for use. One of these sections shall be considered if it is deemed to be more economical or structurally adequate than an Indiana bulb-tee member. See Figures 406-14G through 406-14L, and 406-14S through 406-14X for details and section properties.

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS (OLD BUSINESS)

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: [1] A new signal controller cabinet should now include two loop detector racks. [2] There is also a need to further describe radio signal interconnection as it is now the preferred method to interconnect traffic signals.

PROPOSED SOLUTION: [1] Clarify the basis of payment for loop detector racks in 805-T-169 [2] Add pay items and construction information to 805-T-169 for signal systems connected via radio interconnect.

APPLICABLE STANDARD SPECIFICATIONS: 805.07, 805.15, and 805.16

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: 805-T-093, 805-T-169, and 922-T-168

PAY ITEMS AFFECTED:

805-02658 Cable, Coaxial
805-03793 Detector Card Rack and Detector Modules
805-08464 Radio, Interconnect
805-09088 Radio Antenna, Omni
805-09089 Radio Antenna, Yagi
805-09091 Radio Antenna, Dual
805-09540 Loop Detector Rack
805-78790 Loop Detector Delay Amplifier, 4 Chan.
805-92504 Loop Detector Delay Amplifier, 2 Chan.

Submitted By: Dave Boruff

Title: Traffic Administration Section Supervisor

Organization: INDOT

Phone Number: (317) 234-7975

Date: 3/26/12

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc review by industry, district traffic engineers, and the Traffic Control Systems Division.

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

REVISION TO RSP 805-T-169 TRAFFIC SIGNALS

(Only affected sections of the RSP 805-T-169 are shown with proposed changes highlighted in gray)

805.07 Wire, ~~and~~ Cable, *and Radio* Installations

(a) Wire and Cable Installations

All cable runs attached to utility poles shall have code clearance relative to utility cables. They shall be no less than 18 ft ~~(5.5 m)~~ above the ground level except over railroad tracks when a minimum of 27 ft ~~(8.2 m)~~ clearance shall be maintained. All cable runs shall be installed in continuous lengths without splices between terminals except when necessary at handholes, junction boxes, pole signal bases, and pedestal bases. The type of cable and the number of conductors as well as the gage shall be as shown on plans unless otherwise specified.

Cable rings shall be used to support the signal cable on the signal span cable. They shall be spaced 12 in. ~~(300 mm)~~ on center. Cable shall be pulled through the conduit to the terminal panel in the controller cabinet. Caution shall be used to prevent damage to the cable when it is being pulled through conduit.

Coded cable conductors shall be used throughout the installation. Cable conductors shall be tagged at all detector housings, handholes, ~~pole~~ signal *pole* bases, and controller cabinets. *At the ends of each cable, the tag shall be placed between 4 and 8 in. ~~(100 and 200 mm)~~ from the end of the wire and on the outer jacket. At all other locations, the tag shall be placed in the middle of the length of cable stored at the location. The tag shall be 1/2 in. ~~(13 mm)~~ wide, thermal printed black on yellow or black on white, polyester or nylon tape with permanent adhesive and shall be water, chemical and scratch resistant. The font shall be arial, size 10. Tags shall be installed flag style around the cable with the backs of the tag ends placed together*. Tags shall ~~consist of an aluminum blank of sufficient size to be stamped with not less than 3/16 in. (5 mm) high all upper case letters which~~ identify the cables by their use ~~and phase~~. The following are the uses which shall be indicated by the tags:

~~(a)~~*1.* Power

~~(b)~~*2.* Pedestrian Signal

~~(c)~~*3.* Pedestrian Actuation

~~(d)~~*4.* Signal ~~Phase Identification~~

~~(e)~~*5.* Detection Loop Identification

~~*(f)*~~*6.* *Interconnect*

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

REVISION TO RSP 805-T-169 TRAFFIC SIGNALS

Signal cables shall be tagged to identify the direction of travel. Detector lead-in cables shall be tagged throughout the installation with the corresponding loop tag information.

~~Loop identification shall consist of the following:~~

~~Inside of the Detector Housing, the loop wires of each loop shall be tagged with, in _____, out _____, as shown on the plans.~~
~~Loop Number Loop Number~~

~~Inside of the Controller Cabinet, each lead-in cable shall be tagged within 6 in. (150 mm) of the terminal strip connection with: Lane designation, Phase Number, Loop Number, and when applicable with loop system number, and speed trap according with the plans.~~

~~Phase identification shall consist of the single number "1", "2", "3", etc., which corresponds to the phase diagram for the respective intersection. Tags shall be securely fastened to the cable with a non-corroding material.~~ The tagging material and fastening shall be approved prior to proceeding with this work. The color coded wires shall be connected properly. The white wire shall be the common or ground. Wire used for all identical indications of any individual phase shall be color coded and, where possible, shall use red wire to connect red lenses, orange wire to connect yellow lenses, and green wire to connect green lenses. Signal heads shall be assembled and wired before being installed. The testing of the loops shall be documented in the Loop Testing Table provided by the State.

(b) Radio Installations

1. General

This work shall consist of furnishing and installing spread spectrum radio equipment for interconnecting traffic signal controllers utilizing materials from the Department's list of approved Traffic Signal and ITS Control Equipment. The Contractor shall furnish 2 copies of the instructions for hardware installation, programming and system commissioning.

2. Installation

To receive maximum signal strength, the radio antennas shall be positioned by adjusting the antenna direction while monitoring signal strength through the telemetry radio. The radio antenna mounts shall be securely fastened to the poles. Coaxial cable shall be installed inside metal poles and conduits. External cable on poles shall not exceed 3 ft unless approved by the Engineer. Approved external cable runs exceeding 3 ft shall be secured using manufacturer specified hangers at a maximum spacing of 3 ft. Cable terminations shall be in accordance with the manufacturer's recommendations. Connectors outside of cabinets shall be sealed in accordance with the manufacturer's recommendations. The Contractor shall deburr any holes made in metal poles and install

grommets for protection. Drip loops shall be provided between the antenna connector and the metal pole entrance or first pole clamp. Cable bends shall be in accordance with the manufacturer's specified bending radius.

3. Testing

Test of the radio interconnection system shall be performed after the installation is complete. Notice of the testing shall be provided to the district traffic office at least 2 work days prior to the test. The Contractor shall adjust the radio antennas to optimize the communication signal for the system. The strength of the communication signal shall be determined using computer software provided by the radio interconnection system manufacturer. The test shall be conducted with complete foliage on deciduous trees in the vicinity or on a date approved by the Engineer. The test results shall include the signal strength, site polling results using long message polling, and noise levels. The test results shall be above the minimum guidelines set by the radio interconnect system manufacturer.

SECTION 805.15, REVISE AS FOLLOWS:

805.15 Method of Measurement

Traffic signal head~~,~~*;* pedestrian signal head~~,~~*;* pedestrian push button~~,~~*;* controller cabinet foundation~~,~~*;* M foundation modified to P-1 foundation*;* signal steel strain pole~~,~~*;* signal wood pole~~,~~*;* ~~signal cantilever structure,~~ *signal cantilever structure, signal arm; signal cantilever structure, combination arm; signal cantilever structure, pole section 2, pole diameter 17 in.* ~~*(432 mm)*~~*; signal cantilever structure, pole section 2, pole diameter 24 in.* ~~*(610 mm)*~~*; signal cantilever structure, drilled shaft foundation type; signal cantilever structure, spread footing foundation type;* signal support foundation~~,~~*;* signal service~~,~~*;* disconnect hanger~~,~~*;* magnetometer detector~~,~~*;* microloop detector~~,~~*;* loop detector delay amplifier~~,~~*; loop detector delay counting amplifier; loop detector rack; auxiliary BIU panel; radio antenna; radio interconnect; radio splitter;* signal handhole~~,~~*;* signal detector housing~~,~~*;* span catenary and tether~~,~~*;* and span catenary for flasher will be measured by the number of units installed.

The pay length for a signal cantilever arm or combination arm will be the length shown in the Schedule of Pay Items.

Conduit of the type specified will be measured by the linear foot ~~(meter)~~ from outside to outside of foundations. Signal cable and signal interconnect cable will be measured by the linear foot ~~(meter)~~.

Preformed pave-over loops will be measured by the number of loops placed. Each loop will be measured only once, regardless of the number of signal cable turns. Signal cable from preformed pave-over loops to handholes, detector housings or from loop to loop will not be measured for payment.

The accepted quantities for payment for electrical signal or loop lead-in cable will be the quantities shown in the Schedule of Pay Items. Such quantities may be corrected if they are in error by more than 25%.

Saw cut for roadway loop detector and sealant will be measured by the linear foot ~~(meter)~~ for the full depth of slot cut in the pavement as shown on the plans or as directed.

If class X material is encountered during foundation excavation, measurement will be made in accordance with 206.10.

Radio, interconnection system testing, ~~T~~traffic signal installation or modernization, flasher installation or modernization, miscellaneous equipment for traffic signals, and final cleanup in accordance with 805.14 will not be measured for payment.

Traffic signal equipment removal ~~and~~*will be measured per each installation to be removed*. ~~t~~*T*ransportation of salvageable signal equipment will not be measured.

805.16 Basis of Payment

Radio, interconnection system testing, ~~T~~traffic signal installation, flasher installation, traffic signal modernization, and flasher modernization, all of the type and the location number specified, will be paid for at a contract lump sum price.

If specified as pay items, ~~traffic signal~~ controller and cabinet~~,~~*;* traffic signal head~~,~~*;* pedestrian signal head~~,~~*;* pedestrian push button~~,~~*;* controller cabinet foundation~~,~~*;* M foundation modified to P-1 foundation~~,~~*; radio antenna; radio, interconnect; radio splitter;* signal steel strain pole~~,~~*;* signal wood pole~~,~~*;* ~~signal cantilever structure,~~ *signal cantilever structure, signal arm; signal cantilever structure, combination arm; signal cantilever structure, pole section 2, pole diameter 17 in.* ~~*(432 mm)*~~*; signal cantilever structure, pole section 2, pole diameter 24 in.* ~~*(610 mm)*~~*; signal cantilever structure, drilled shaft foundation type; signal cantilever structure, spread footing foundation type;* signal support foundation~~,~~*;* signal pedestals~~,~~*;* signal service~~,~~*;* disconnect hanger~~,~~*;* magnetometer detector~~,~~*;* microloop detector~~,~~*;* loop detector delay amplifier~~,~~*; loop detector delay counting amplifier; loop detector rack; auxiliary BIU panel;* signal handhole~~,~~*;* signal detector housing~~,~~*;* span catenary and tether~~,~~*;* and span catenary for flasher will be paid for at the contract unit price per each. Conduit of the type specified, signal cable, interconnect cable, electrical signal cable, loop lead-in cable, and saw cut for roadway loop detector and sealant will be paid for at the contract unit price per linear foot ~~(meter)~~.

Preformed pave-over loops will be paid at the contract unit price per each.

The removal of existing traffic signal equipment designated to be removed will be paid for at the contract ~~lump sum~~ *unit* price *per each* for traffic signal equipment, remove *for each location removed*. When designated as a pay item, the transportation of salvageable signal equipment will be paid for at the contract lump sum price for transportation of salvageable signal equipment.

Class X excavation will be paid for in accordance with 206.11.

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

REVISION TO RSP 805-T-169 TRAFFIC SIGNALS

Miscellaneous equipment for traffic signals will be paid for at a contract lump sum price.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Auxiliary BIU Panel	*EACH*
Conduit _____ *type*	*LFT ~~(m)~~*
Controller and Cabinet, _____, _____ Phase (type, no.)	EACH
Controller and Cabinet, Flasher, _____ (type)	EACH
Controller Cabinet Foundation, _____ (type)	EACH
Controller Cabinet Foundation, M, Modify to P-1	EACH
Disconnect Hanger	EACH
Flasher Installation, Location No. _____	LS
Flasher Modernization, Location No. _____	LS
Handhole, Signal	EACH
Loop Detector Delay Amplifier, _____ Channel (no.)	EACH
Loop Detector Delay *Counting* Amplifier, _____ Channel (no.)	EACH
Loop Detector Rack	*EACH*
Magnetometer Detector	EACH
Microloop Detector *Probe*	EACH
Miscellaneous Equipment for Traffic Signals	LS
Pedestrian Push Button	EACH
Pedestrian Signal Head, _____, _____ (type, lens size)	EACH
Radio Antenna	*EACH*
Radio, Interconnect	*EACH*
Radio, Interconnection System Testing	*LS*
Radio Splitter	*EACH*
Saw Cut for Roadway Loop and Sealant	LFT ~~(m)~~
Signal Cable, _____, No. _____ Copper, _____ C/ _____ (type, conductors/size)	LFT ~~(m)~~
Signal Cable, Preformed Pave-Over Loop	*EACH*
~~Signal Cantilever Structure, Mast Arm _____ ft (m) (length)~~	~~EACH~~
Signal Cantilever Structure, Signal Arm _____ ft ~~(m)~~ (length)	*EACH*

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

REVISION TO RSP 805-T-169 TRAFFIC SIGNALS

Signal Cantilever Structure, Pole Section 2,
Pole Diameter 17 in. ~~(432 mm)~~ ..... EACH
Signal Cantilever Structure, Pole Section 2,
Pole Diameter 24 in. ~~(610 mm)~~ ..... EACH
Signal Cantilever Structure, Combination Arm _____ ft ~~(m)~~ ..... EACH
length
Signal Cantilever Structure, Drilled Shaft Foundation, _____ ..... EACH
type
Signal Cantilever Structure, Spread Footing Foundation, _____ ..... EACH
type
Signal Detector Housing ..... EACH
Signal Interconnect Cable, ____, No. ____
type
Copper, ____ C/ ____ ..... LFT ~~(m)~~
conductors/size
Signal Pedestal, _____ ft ~~(m)~~ ..... EACH
length
Signal Pole, Wood, _____, _____ ft ~~(m)~~ ..... EACH
class length
Signal Service ..... EACH
Signal Strain Pole, Steel, _____ ft ~~(m)~~ ..... EACH
length
Signal Support Foundation, _____ in. ~~(mm)~~ x _____ in. ~~(mm)~~
x _____ in. ~~(mm)~~ ..... EACH
Span and Catenary for Flasher ..... EACH
Span, Catenary, and Tether ..... EACH
Traffic Signal Equipment, Remove ..... ~~LS~~*EACH*
Traffic Signal Head, _____ Way, _____ Section, _____ ..... EACH
no. no. lens sizes & colors
Traffic Signal Installation, _____, Location No. _____ ..... LS
type
Traffic Signal Modernization, _____, Location No. _____ ..... LS
type
Transportation of Salvageable Signal Equipment ..... LS

The cost of the solar panel, battery cabinet, program timing module, signal heads, wiring, and all hardware required to complete the installation shall be included in the cost of flasher installation or flasher modernization.

The cost of all wiring, hardware, anchor bolts, and associated equipment required to operate the intersections shall be included in the cost of controller and cabinet, flasher.

The cost of 2 loop detector racks, all wiring, hardware, anchor bolts, and associated equipment required to operate the intersection shall be included in the cost of

controller and cabinet. The cost of any additional loop detector racks shall be included in the cost of loop detector rack.

The cost of signal face hook-up wire, pole plates and arms for side mounts, mid-mast arm mount, pipe arms, signal brackets, visors, louvers, bulbs, span hanger, backplates, balance adjuster, weatherhead, and all additional hardware required to assemble a combination of signal faces as shown on the plans shall be included in the cost of traffic signal head or pedestrian signal head.

The cost of the push button, pedestrian actuated signal sign, and all hardware required to complete the installation shall be included in the cost of pedestrian push button.

The cost of concrete, conduits, grounding bushings, ground rod, ground wire, drainage, and all hardware required to complete the installation shall be included in the cost of controller cabinet foundation.

The cost of the base plate, metal skirt base plate, anchor bolts, handhole and cover grounding lug, 2 in. ~~(50 mm)~~ pipe cable entrance, J hook, and top cover as shown on the plans shall be included in the cost of signal strain pole, steel.

The cost of downguys, anchor rods, downguy guards, and hub-eyes as shown on the plans, and all hardware required to complete the installation shall be included in the cost of signal pole, wood.

The cost of all hardware including the metal skirt base plate, where necessary, to complete the installation as shown on the plans shall be included in the cost of signal cantilever structure.

The cost of signal pole section 1 shall be included in the cost of the signal cantilever structure.

The cost of concrete, reinforcing steel, conduits, ground rod, ground wire, grounding bushings, and all hardware required to complete the installation shall be included in the cost of signal support foundation.

The cost of the pedestal metal base, pedestal pole, pole cap when necessary, anchor bolts, and all hardware required to complete the installation shall be included in the cost of signal pedestal.

The cost of weatherhead, 1 in. ~~(25 mm)~~ conduit riser, entrance switch, 1 in. to 2 in. ~~(25 mm to 50 mm)~~ conduit reducer, ground rod, ground wire, and all hardware required to complete the installation, including the meter base when required and supplied by the utility company shall be included in the cost of signal service.

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

REVISION TO RSP 805-T-169 TRAFFIC SIGNALS

The cost of the detector unit, lead-in cable, and all work necessary for proper installation shall be included in the cost of magnetometer detector or microloop detector *probe. The cost of all hardware and work required to provide and install signal cable from microloop detector probe, including extra-low voltage (home-run), from the handhole adjacent to the detector probe to the controller cabinet shall be included in the cost of signal cable.*

The cost of the slot cut on the pavement, ~~sash cord,~~ backer rod, loop sealant, and all testing in accordance with 805.09 shall be included in the cost of saw cut for roadway loop and sealant.

The cost of signal cable from preformed pave-over loops to handholes, detector housings or from loop to loop shall be included in the cost of the preformed pave-over loop.

The cost of all work and hardware required to properly install overhead or underground signal cable as shown on the plans or as directed shall be included in the cost of signal cable and signal interconnect cable.

~~The cost of the independent shelf mount unit or card rack unit, and power module shall be included in the cost of loop detector delay amplifier.~~

The cost of concrete reinforcing pipe, ring and cover eye bolts, hardware, handhole bottom, and aggregate under the handhole bottom as shown on the plans shall be included in the cost of handhole, signal.

The cost of aluminum casting, enclosure concrete, ~~steel~~ conduit and elbow, and all hardware required to complete the installation shall be included in the cost of signal detector housing.

The cost of steel pole bands or straight eye bolts, span, catenary, and tether of wire rope cables, cable rings, type A support cable, wire rope clips, safety cable, thimble, service sleeve, and all hardware required to complete the installation as shown on the plans shall be included in the cost of span, catenary, and tether for signal, or span and catenary for flasher.

The cost to repair or replace damaged or lost salvageable traffic signal equipment shall be at the Contractor’s expense.

The cost of excavation, backfill, final cleanup in accordance with 805.14, and necessary incidentals shall be included in the cost of the pay items in this section.

77-6.03 Communications Techniques

A system other than a time-based coordinated system requires a communications medium to maintain synchronized operation between intersections. The primary options available for system interconnection are hardwired communications and through-the-air frequency. Hardwired communications can include leased telephone lines, cable-television lines, fiber optics, or direct wiring. Through-the-air interconnections can include radio, microwave, or cellular telephones. ~~The requirements for the communications network are dependent on the needs of the system~~. *Radio interconnection is the Department's preferred communication method if the radio site survey is satisfactory*. ~~Therefore, the decision on which~~ *The use of other* interconnection ~~method to use~~ *methods* will be determined on a system-by-system basis.

77-6.03(01) Radio Site Survey

The District or the designer will conduct a site survey and submit the completed radio site survey report to the District Traffic Engineer. The radio site survey should be conducted with complete foliage on deciduous trees in the vicinity to assure a minimum level of communications during the summer months. An approved digital Ethernet radio should be used for the survey. The radio site survey report form is shown in Figure 77-6A. A copy of the radio site survey report should be included in the contract information book.

77-6.03(02) Radio Communication Equipment

The District or the designer will determine, based on the results of the radio site survey, what type of radio antenna should be used and the number of repeaters, if any, which are necessary for the signal system.

REVISION TO SPECIAL PROVISION (OLD BUSINESS)

BACKUP 02. IDM FIGURE 77-6A RADIO SITE SURVEY REPORT (DRAFT)

RADIO SITE SURVEY REPORT

General Location Information		
Location:		
Commission Number:	Contract Number:	Project Des Number:
Date of Survey:	Weather Conditions:	Equipment Used:
Location of Master Controller:		

Radio Survey Information			
Radio Configuration:	Master:	Repeater:	Remote:
Was a Spectrum Analyzer used? ☐ Yes ☐ No			
Personnel in Attendance:			
Instruction: Will need #1 and #2 Primary Pattern if this is a repeater location.			
1. Identify Primary Hop Pattern #1:			
2. Identify Primary Hop Pattern #2:			
Identify recommended antenna location:			
Recommended location and orientation of antenna: (specify distance from pole on mast arm) ☐ Vertical ☐ Horizontal			Pointing:
Mounting:	☐ Standard Bracket		☐ Truss Arm Length
Communications Test	No. of Polls:		% Successful:
Base Unit Signal Strength:		Mobile Unit Signal Strength:	
Comments:			
Radio Site Surveyor Signature:			

Figure 77-6A – Radio Site Survey Report Form

COMMENTS AND ACTION (OLD BUSINESS)

RSP 805-T-169 TRAFFIC SIGNALS

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: SECTION 805 (SEE RSP 805-T-169) Recurring Special Provision affected: 805-T-169 TRAFFIC SIGNALS Standard Sheets affected: NONE Design Manual Sections affected: SECTION 77-06 GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS (OLD BUSINESS)

REVISION TO SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Maintenance of traffic plans often do not include any details about portable changeable message sign (PCMS) location and purpose leaving uncertainty for bidders about the amount of effort that will be involved in changing messages and locations. Too often for contracted and in-house work PCMS do not display appropriate messages or are improperly located.

PROPOSED SOLUTION: Develop an agency wide guideline for PCMS use and make associated revisions to the Design Manual and Standard Specifications.

APPLICABLE STANDARD SPECIFICATIONS: 801.02, 801.15, 801.17, and 801.18

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: Section 83-2.06

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: David Boruff, P.E.

Title: Traffic Administration Manager

Organization: INDOT

Phone Number: (317) 234-7975

Date: 3/23/12

APPLICABLE SUB-COMMITTEE ENDORSEMENT? Developed by a Task Group that included Paul Berebitsky, Myron Short, Steve Apple (Industry), Ron Heustis, Steve Wuertz, Todd Shields, Pat McCarty, Abby Lalko (INDOT). Reviewed by Production and district staff including Jim Poturalski, Shakeel Baig, Dana Plattner, and Prakash Patel.

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS
801.02 MATERIALS
801.15(b) CHANGEABLE MESSAGE SIGNS
801.17 METHOD OF MEASUREMENT
801.18 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 801, AFTER LINE 22, DELETE AND INSERT AS FOLLOWS:

Portable Changeable Message Sign *923.05*
Steel Posts 910.14
Temporary Barrier Delineator.....926.02(d)
Temporary Highway Illumination Materials 807
Temporary Panel Signs 919.01
Temporary Pavement Marking Tape 923.01
Temporary Raised Pavement Markers.....923.02
Traffic Signal Materials and Equipment.....922
Traffic Signs.....802
Tubular Marker .....923.0~~6~~*7*
Wood Sign Posts .....911.02(e)
Worksite Speed Limit Sign Assembly.....923.0~~5~~*6*

SECTION 801, BEGIN LINE 711, DELETE AND INSERT AS FOLLOWS:

(b) Portable Changeable Message Signs, *PCMS*

This shall consist of furnishing, installing, and maintaining a trailer-mounted, portable sign upon which varying electronically generated messages will be displayed to traffic. The message being relayed to traffic shall be legible and easily understood for a minimum distance of 650 ft (~~200 m~~).

~~A malfunctioning sign shall be repaired or replaced within 24 h~~

The Contractor shall display the messages shown on the plans or as approved or directed by the Engineer. Messages shall be formatted in accordance with INDOT Guidelines for Portable Changeable Message Signs. Only upper case letters shall be used. Each message phase shall be displayed for at least 2 s. Display time for an entire message shall not exceed 8 s.

Placement of PCMSs shall be as shown on the plans or as directed by the Engineer. A minimum clearance of 7 ft from pavement to the bottom of the PCMS shall be provided. Units shall be level and trailers shall be leveled. PCMSs shall be turned away from traffic, placed in stand-by mode, or left blank until there is a valid message to be displayed. When in use PCMSs shall be turned approximately 3° from perpendicular towards oncoming traffic to minimize glare.

SECTION 801, BEGIN LINE 848, DELETE AND INSERT AS FOLLOWS:

801.17 Method of Measurement

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS
801.02 MATERIALS
801.15(b) CHANGEABLE MESSAGE SIGNS
801.17 METHOD OF MEASUREMENT
801.18 BASIS OF PAYMENT

Construction signs, detour route marker assemblies, detour route marker assemblies-multiple routes, temporary worksite speed limit sign assemblies, road closure sign assemblies, ~~temporary~~ *portable* changeable message signs, *Aries Field Processor for PCMS,* and temporary raised pavement markers will be measured by the number of units installed, maintained, and removed.

SECTION 801, BEGIN LINE 918, DELETE AND INSERT AS FOLLOWS:

801.18 Basis of Payment

The accepted quantities of construction signs, detour route marker assemblies, detour route marker assemblies-multiple routes, temporary worksite speed limit sign assemblies, road closure sign assemblies, permanent road closure sign assemblies and temporary raised pavement markers will be paid for at the contract unit price per each. Payment for temporary worksite speed limit assemblies, ~~and temporary changeable message signs~~ *PCMS, and Aries Field Processors* will be made for the maximum number of such assemblies in place at any one time during the life of the contract. Type III-A, type III-B, and permanent type III barricades will be paid for at the contract unit price per linear foot ~~(meter)~~.

SECTION 801, BEGIN LINE 1009, DELETE AND INSERT AS FOLLOWS:

Pay Item	**Pay Unit Symbol**
Aries Field Processor for PCMS	*EACH*
Barricade, _____ type	LFT ~~(m)~~
Barricade, III, Permanent	LFT ~~(m)~~
Barrier, Direction Indicator	EACH
Construction Sign, _____ type	EACH
Detour Route Marker Assembly	EACH
Detour Route Marker Assembly, Multiple Routes	EACH
Drum, Permanent	EACH
Energy Absorbing Terminal, CZ, TL - _____ test level	EACH
Flashing Arrow Sign	DAY
Maintaining Traffic	LS
Patroller	DAY
Portable Changeable Message Sign	*EACH*
Road Closure Sign Assembly	EACH
Road Closure Sign Assembly, Permanent	EACH
Temporary Buzz Strips	LFT ~~(m)~~
~~Temporary Changeable Message Sign~~	~~EACH~~

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS
801.02 MATERIALS
801.15(b) CHANGEABLE MESSAGE SIGNS
801.17 METHOD OF MEASUREMENT
801.18 BASIS OF PAYMENT

SECTION 801, BEGIN LINE 1121, DELETE AND INSERT AS FOLLOWS:

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

No additional payment will be made for changes in PCMS message or location that are shown in the plans or suggested by the contractor. Additional materials necessary to place the PCMS in a secure and level manner for site conditions shall be included in the cost of the pay item. All costs required to furnish, install, program, and maintain the PCMS shall be included in the cost of the pay item. The cost of IP cellular phone service shall be included in the cost of the pay item.

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

SECTION 923 – TEMPORARY TRAFFIC CONTROL DEVISES
923.05 TEMPORARY WORKSITE SPEED LIMIT SIGN ASSEMBLY
923.06 TUBULAR MARKER
923.07 ACCEPTANCE OF TEMPORARY TRAFFIC CONTROL DEVICES

The Standard Specifications are revised as follows:

SECTION 923, AFTER LINE 230, DELETE AND INSERT AS FOLLOWS:

923.05 Portable Changeable Message Sign

Portable changeable message signs shall be capable of displaying 3 lines with of 8 characters per line. Letter height shall be a minimum of 18 in. The sign shall have automatic dimming capability for nighttime operation.

Portable changeable message signs shall be selected from the Department's list of approved Solar Power Traffic Control Devices.

923.0~~5~~*6* Temporary Worksite Speed Limit Sign Assembly

The temporary worksite speed limit sign assembly shall be an all weather, self-contained unit designed to display speed limit signs in accordance with the MUTCD and as shown on the plans. The signs shall be installed on frangible posts or mounted on movable stands or trailers in accordance with 910.14(f). The power source shall be capable of operating the strobe lights, without service, for the period which the sign is in effect. An on/off switch will be required.

923.0~~6~~*7* Tubular Marker

The vertically placed portion of this device shall consist of high density polyethylene plastic in accordance with ASTM D 5203. The base material shall be butyl rubber in accordance with ASTM D 5900 or high impact polystyrene in accordance with ASTM D 4549. Epoxy material used to attach the base to the roadway surface shall be in accordance with the manufacturer's recommendations. The tubular portion shall be reflectorized with high intensity reflective sheeting in accordance with 919.01(b)1 as shown on the plans.

923.0~~7~~*8* Acceptance of Temporary Traffic Control Devices

Temporary traffic control devices will be accepted by visual inspection unless otherwise indicated.

83-2.06 Portable Changeable Message Signs

A portable changeable message sign (PCMS) is effective in communicating ~~the~~ construction zone information to the general public. ~~NDOT's practice is to use PCMS on each applicable freeway construction project. The use of a PCMS on another type of facility should be determined on a project-by-project basis based on road alignment, traffic routing, or other situation requiring advance warning and information~~. *Its use in a construction project shall be as outlined in INDOT Guidelines for Portable Changeable Message Signs*. ~~For each facility, the applications where the PCMS device may be effectively used in construction zones are as follows:~~

~~1. where speed is expected to drop substantially;~~
~~2. where significant traffic queuing and delays are expected;~~
~~3. where a change in road alignment or surface conditions are present;~~
~~4. to provide advance notice of a ramp, lane, or road closure;~~
~~5. to notify or direct motorists to alternate routing; or~~
~~6. to show a work-site speed limit as supplemental to other regulatory signs.~~

83-2.06(01) Need

A PCMS should be considered for each project including the following:

1. *intermittent or short term, road, lane, or ramp closure;*
2. *frequent changes in traffic patterns;*
3. *at least one road with traffic volumes that will be at or over capacity during construction; or*
4. *other projects as deemed necessary by the following:*
    a. *the district office;*
    b. *the Construction Management Division; or*
    c. *the Traffic Management and District Support Business Unit.*

A PCMS should not be used to convey a message that can be effectively conveyed with static signing.

The need for a PCMS and the selection of messages should be considered during the course of Maintenance of Traffic Plan development.

In developing the MOT plan the designer should determine the answers to these questions:

- *What type of closures or restrictions does the MOT plan generate?*
- *How long will the closures or restrictions be in effect?*
- *Will potentially hazardous conditions exist, such as like narrow lane widths or workers, equipment, or materials encroaching onto the travel lanes? If so for*

how long?

- *Is queuing or delay likely to occur as a result of the MOT?*
- *Will a work zone speed limit that is at least 15 mph lower than the permanent posted speed be enacted?*
- *What is the crash history of the project location?*

Conferring with the district construction and traffic offices will provide insights to these issues. With this information, the Guidelines can be applied to determine whether a PCMS should be included and if so what messages should be displayed.

83-2.06(02) Plans Requirements

If a PCMS is needed the following information will be provided on the plans or in the contract documents:

1 The approximate location of each PCMS. Unless there are specific reasons otherwise, each PCMS is to be located as shown in the Guidelines, Tables I and II.

2 The message content for each PCMS. Each message shall be selected from the standard messages shown in the Guidelines, Table VII, or developed as non-standard. The district Traffic Office or the Traffic Management Center can be consulted for assistance with message development.

Figure 83-2E, Programming Information for Portable Changeable Message Sign, shall be included in the contract documents for each non-standard message on each PCMS.

A pay item for portable changeable message sign and the appropriate quantity should be included in the estimate of quantities and cost estimate.

The *MUTCD* provides the design and application criteria relative to a PCMS. The designer should also consider the following *in* specifying a PCMS.

1 Display. The display should provide not more than the maximum amount of information that can be read and comprehended by the motorist at a quick glance, i.e., no rolling messages. ~~The typical changeable message sign~~ *A PCMS* is capable of displaying three lines of eight characters each. There should be not more than ~~three~~ *two* messages phased in order to provide readability and comprehension. Each message *phase* should be able to stand alone. For multiple messages, ~~use~~ two signs *should be used*.

~~2~~ Location. The sign should be visible from 2500 ft under ideal day and night conditions. ~~and~~ The first message should be legible at a minimum distance of 650 ft from ~~all~~ each lane. ~~A~~ PCMS ~~should~~ are *typically* be placed in

advance of any other advance warning sign. ~~If two signs are needed to communicate a multiple message, they should be placed on the same side of the roadway and separated by at least 1000 ft. A PCMS is placed on the shoulder, but if practical may be farther from the traveled way. Overhead placement may also be considered.~~ *For more information on location see the Guidelines, Placement section.*

3 Traffic Control Devices. A PCMS may be used as a supplement, but it should not be used as a substitute to the proper use of ~~conventional~~ *other* traffic control devices.

4 Flashing Arrow Signs. A PCMS should not be used as an alternative to flashing arrow signs. However, a PCMS may be used to simulate an arrow display in the message.

83-2.06(03) TMC Control of PCMS Operation

As part of the Traffic Management Plan for q project in an Advanced Traffic Management System (ATMS) area, the designer shall consult with the district Construction Office and the appropriate Traffic Management Center to determine whether TMC control of the PCMS is desired. The ATMS areas are as follows:

Indianapolis and Southern Indiana, Indianapolis TMC
I-64, mile 118 to 124
I-65, mile 0 to 9
I-65, mile 86 to 149
I-69, mile 0 to 29
I-70, mile 55 to 106
I-74, mile 66 to 73
I-74, mile 94 to 101
I-265, mile 0 to 9
I-465, mile 0 to mile 53
I-865, mile 0 to mile 5

Northwest Indiana, Gary TMC
I-65, mile 236 to 262
I-80/94, mile 0 to 16
I-94, mile 16 to 46
SR 912, mile 6 to 10

If the PCMS will be TMC controlled, the Aries Field Processor unique special provision should be included in the contract set.

PROGRAMMING INFORMATION FOR
PORTABLE CHANGEABLE MESSAGE SIGN

*LOCATION OF PCMS:*_____

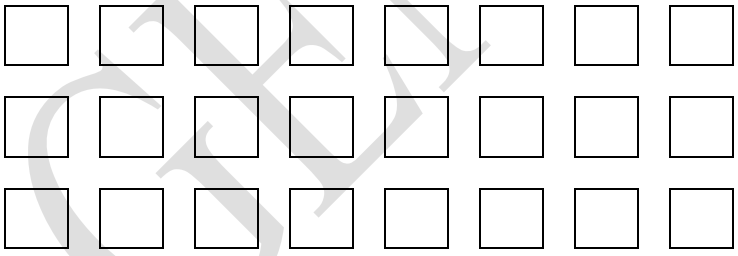
*MESSAGE DISPLAYED DURING MOT phase, event, etc):*_____ _____

_____

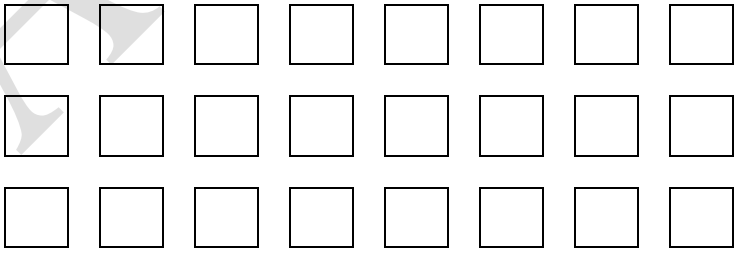
CREATED BY _____

_____

MESSAGE PHASE 1



MESSAGE PHASE 2



REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

BACKUP 02. UNIQUE SPECIAL PROVISION: ARIES FIELD PROCESSORS (FOR REFERENCE ONLY)

ARIES FIELD PROCESSORS

DESCRIPTION. To maintain compatibility with the Department's statewide Advanced Traffic Management System / Automated Traveler Information System and field elements, ARIES Field Processors shall be furnished, installed, and tested as described below. The Aries Field Processors shall be delivered 10 (ten) days before any lane restricting activities.

MATERIALS. Portable Dynamic Message Sign ARIES Field Processor. There shall be (1) one per Portable DMS. The Portable DMS ARIES Field Processor shall be specified and configured as follows:

Shall be an Iron Mountain Systems, Inc. Model AFPjr-256M-CF2G-001, Shall operate from a 9 - 30 Volt DC electrical subsystem;

METHOD OF MEASUREMENT

Aries Field Processors will be measured per EACH.

BASIS OF PAYMENT

Aries Field Processors shall be paid for at the contract unit price per EACH, complete in place.

Payment will be made under:

Pay Item	Pay Unit Symbol
Aries Field Processor	EACH

INDOT GUIDELINES FOR PORTABLE CHANGEABLE MESSAGE SIGNS

Section I. POLICY STATEMENT

This policy provides specific requirements and guidelines for the use of portable changeable message signs (PCMS) on the Indiana highway system. PCMS's provide an excellent means to communicate with motorists since they are easily noticed and command attention. It is for these reasons that PCMS's must be used appropriately. Therefore it is INDOT's policy that these principles be followed when considering a PCMS message:

PRINCIPLE #1- RELEVANCE
PCMS's *shall* convey only accurate, pertinent and up to date roadway or emergency information. The display of a message like "CAUTION/CAUTION/CAUTION" is not relaying specific information and as such is not an acceptable use of a PCMS. *(Recommendation 2011 IMUTCD 2L.02)*

PRINCIPLE #2- CLARITY
PCMS messages *shall* be conveyed in a standard, non-confusing manner. Drivers must be able to both read and react to the information given in a timely fashion. *(Recommendation 2011 IMUTCD 2L.02)* Messages shall be one or two phases (display screens) in length; three phase messages are not acceptable.

PRINCIPLE #3- SINGULARITY
PCMS's *should not* display messages for an extended period of time that can be effectively conveyed with static signing (panel or sheet signs). The display of standard highway sign messages on a PCMS over an extended time diminishes the ability of PCMS to command attention. (*Variation on the recommendation 2011 IMUTCD 6F.60)*

PRINCIPLE #4- IMPARTIALITY
PCMS's *shall not* display messages that in any way advertise commercial events or entities *(Requirement 2011 IMUTCD 2L.02).* Messages shall be for the benefit the general motoring public.

Section II. AUTHORITY AND RESPONSIBILITIES

A. Contracted Activities

For contracted activities the Contractor or designated-sub will:

- Supply the PCMS
- Maintain the PCMS
- Relocate the PCMS
- Enter messages (except when the TMC controls)
- Verify message correctness (except when the TMC controls)
- Change messages (except when the TMC controls)

The contractor is not responsible for selecting messages, but rather the designer or District Construction or Technical Services office will determine the appropriate message(s) for each phase of construction or change of conditions. The designer will:

- Show the approximate location(s) in the bid MOT plans
- Determine all foreseeable standard messages associated with the bid MOT plan
- Develop all foreseeable non-standard messages associated with the bid MOT plan or coordinate with District Traffic or the Traffic Management Center to do so
- Include all planned messages, standard and non-standard, in the bid plans
- Develop programming sheets for all non-standard, planned messages
- Include the programming sheets in the contract proposal

If the maintenance of traffic plan is changed after letting the engineer will determine the applicability of the original messages. The engineer may also direct the contractor to display applicable standard messages when the plans do not address a need (see Table VII, page 19). These messages will not supersede applicable higher priority messages detailed in the plans.

For contracted activities in Advanced Traffic Management System areas the District Construction office and the Traffic Management Center (TMC) may agree to control the PCMS through the TMC. This decision will be made during the design process as part of the Traffic Management Plan. In these cases the TMC will generate and change the messages and ensure that the correct message is displayed.

B. Non-Contracted Activities

For non-contracted activities the District Technical Services office will determine the message(s) to be displayed. The PCMS deployer will enter/change messages and ensure that the correct message is displayed.

The TMC may also provide messages for contracted work outside of the ATMS areas or non-contracted activities. However, in these cases it is the Engineer's or PCMS deployer's responsibility to ensure that the message is correct and the highest priority message is displayed.

Section III PLACEMENT

Typical placement of PCMS's are given in tables I and II for various work zone conditions. Engineering judgment should be applied to specific temporary traffic control plan to best locate the PCMS's.

TABLE I: PCMS PLACEMENT FOR FREEWAYS

Event	Duration	Min. # required per approach	Location of 1st PCMS	Location of 2nd PCMS
Road Closure	any length	2	**1 mile** in advance of the detour exit (if detour is provided) or the closure	1000' in advance of the detour exit (if detour is provided) or the closure
Ramp Closure	less than 1 week (or less than 1 month for unplanned closure)	2	**1 mile** in advance of detour exit (if detour is provided) or the closed ramp	1000' in advance of the detour exit (if detour is provided) or the closed ramp
Lane Closure w/ Anticipated Queuing	any length	2	**1 mile** in advance of the previous exit upstream of the anticipated queue length	1000' in advance of anticipated queue length
Lane Closure	mobile or stationary at any one location less than 2 weeks	2	2500' in advance of previous exit upstream of the closure	1000' in advance of the first construction sign
Frequent or Intermittent changes in Alignment	any length	1	1000' in advance of the first construction sign	n/a
Frequent or Intermittent Changes in Pavement Condition	any length	1	1000' in advance of the first construction sign	n/a
Speed Limits reduced by 15 mph or more for Work Zone	any length	1	1000' in advance of the first construction sign	n/a
Location with a Significant Crash History	any length	1	1000' in advance of the first construction sign	n/a

TABLE II: PCMS PLACEMENT FOR NON-FREEWAY STATE HIGHWAYS

Event	Duration	Min. # required per approach	Location of 1st PCMS
Road Closure	less than 2 weeks	1	500' in advance of the first construction sign
Side Road Closure	less than 1 week (or less than 1 month for unplanned closure)	1	500' in advance of the closed side road
Lane Closure w/Peak Hour Delay > 5 minutes	any length	1	1500' in advance of the first construction sign
Lane Closure	mobile or stationary at any one location less than 2 weeks	1	500' in advance of the closed side road
Frequent or Intermittent Changes in Alignment	Any length	1	500' in advance of the first construction sign
Frequent or Intermittent changes in Pavement Condition	Any length	1	500' in advance of the first construction sign
Speed Limits reduced by 15 mph or more for Work Zone	Any length	1	500' in advance of the first construction sign
Location with a Significant Crash History	Any length	1	500' in advance of the first construction sign

Further guidance on the spacing and placement of PCMS's:

- Where possible, PCMS's should be placed behind barrier wall, guardrail or outside the construction clear zone provided that the area can be accessed and the PCMS can be leveled without undue effort. Where it is not practical to positively protect or place outside the construction clear zone the minimum lateral offset should be 6 feet or 12 feet where shoulders are 6 feet or less in width.

- Where possible, PCMS's should be on the right side of the road with the following exceptions:

    - On divided highways the preferred placement for PCMS's is in the median behind protection as might be found at a bridge pier or overpass.

    - In the case of a left lane closure on freeway where the median is at least 30' in width PCMS's should be placed off the left shoulder.

- On curve alignments the angle of placement should be determined by the direction of approaching traffic rather than the roadway edge at the PCMS location.

- Placement in sag curves and just beyond crests should be avoided.

- For work zones in place for at least 1 week the locations of PCMS's used to display queuing/delay information should be adjusted from the planned location according to field observations of actual maximum queue.

- If more than two phases (or screens) are required for a message then the PCMS's shall be used in series~~.~~—that is two consecutive PCMS's displaying the first and last part of the message. For freeways PCMS's used in series shall be placed on the same side of the roadway and spaced at approximately 1000'- for non-divided roads the spacing should be approximately 500'.

- PCMS's oriented for the same direction of travel should not be placed opposite one another on both the left and right sides of the road.

Section IV **MESSAGE TYPE AND PRIORITY**

Portable PCMS's may be used to display messages as indicated in Table III. Priority level 1 messages take precedence over level 2, level 2 over level 3, and so on. In the event that more than one message of the same priority level is needed judgment must be used as to which is most beneficial. The District Traffic office, the Work Zone Safety Section or the Traffic Management Centers may be consulted to make this determination.

TABLE I: MESSAGE PRIORITY

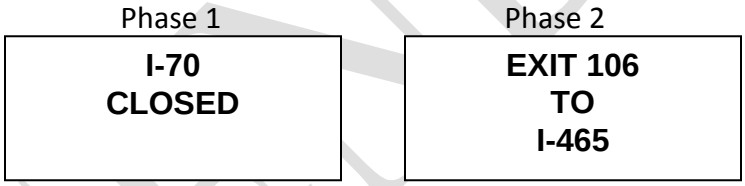
PRIORITY LEVEL	MESSAGE TYPE
1 (highest)	Road Closure
2	Ramp Closure/Access Restriction
3	Hazardous Conditions
4	Real-time traffic information
5	Advance notice for scheduled events.
6 (lowest)	Public information pertinent to highway safety

Message types:

1. **Road Closure**– These are events where complete traffic diversion is required and the closures or effect of the closures will be of sufficient duration for the PCMS to be deployed and programmed.

Examples:

- The Department of Homeland Security conducting nuclear or hazardous material evacuation
- The military requiring road closure for major troop/equipment transport
- Closure of the facility due to a crash, damaged structure, pavement failure or toxic spill
- Roadway closures resulting from hazardous conditions such as landslides, flooding, blizzards, whiteouts, or other severe weather that greatly affects visibility or driver ability
- Road closure due to setting of overhead structures or signals.



In an emergency where another agency is in command of the situation that agency may direct specific use of PCMS's. In all likelihood, the command agency will rely on INDOT for locating and programming signs and developing the exact messages.

2. **Ramp Closure/Access Restriction**– If planned detours are to be in place for more than a week, conventional detour signing should be used. If the detour was not planned, the PCMS can be used as an alternate to conventional signing; however, if the detour is expected to remain in place for more than a month, conventional signs should be installed as soon as possible. These messages can be especially useful for a partial audience for which no other signing is in place. Care must be taken to keep these messages updated with correct information.

   Examples:

   - Detour for specific audience such as over-width vehicles that cannot traverse a construction zone with barriers

- Overnight ramp closure for which no detour is given because it is assumed that motorists know alternate routes

- Closing of an intersecting roadway adjacent to mainline

WIDELOAD USE I-94 TO I-90	**USE CHICAGO SKYWAY**

3. **Hazardous Conditions–** These messages warn of hazardous conditions that do not result in road closure and that cannot be effectively signed for statically by panel or sheet signs. The majority of information relevant to the motorists would fall into this category, therefore it is extremely important for all parties to cooperate and ensure that motorists are receiving the most important information at any particular time. Examples:

    - Crash and/or emergency vehicles in a lane or on the shoulder within or adjacent to the work zone

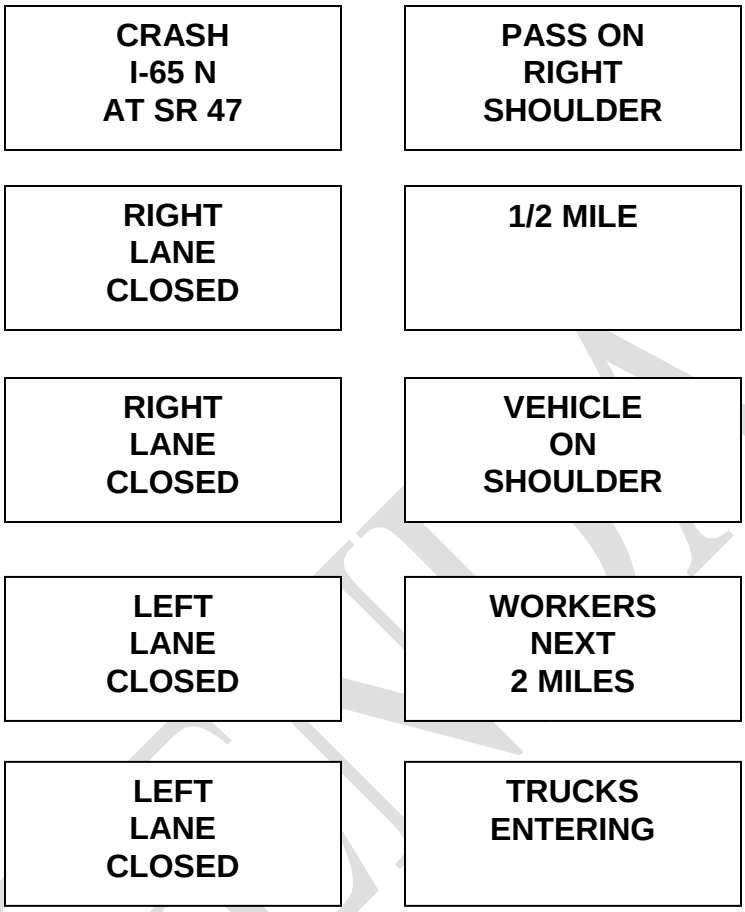
    - Unplanned or short term lane/shoulder closures or blockages

    - Extreme weather that impairs driving ability and/or visibility such as ice, snow, fog, flooding

    - Unusual roadway conditions for the roadway type such as lane shifts, rough pavement or narrow lanes on a freeway due to construction or maintenance

    - Workers or construction equipment in close proximity to an open travel way

    - Speed reduction (e.g. caused by congestion)

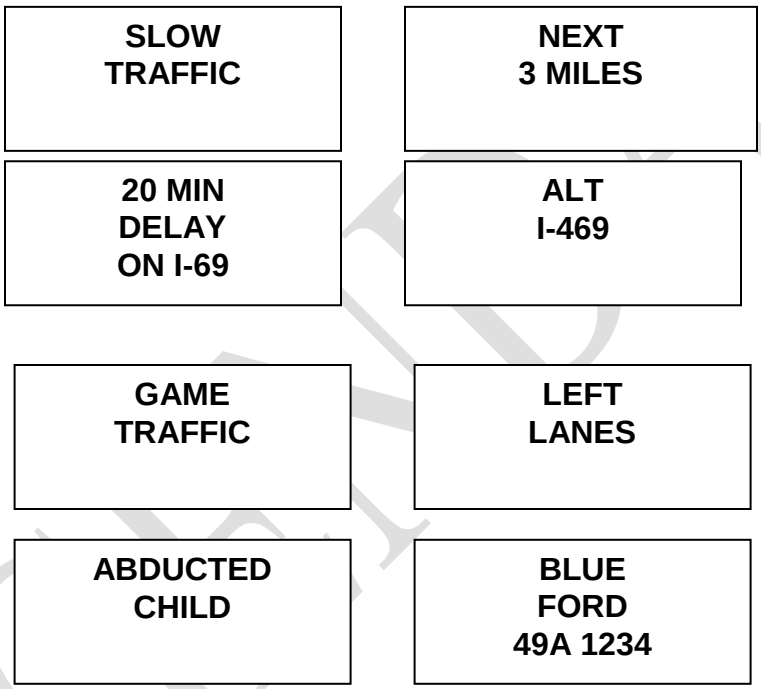


4. **Real-Time Traffic Information–** Information about real-time traffic conditions will help motorists to avoid congestion and delays. In order for motorists to react to this type of information they must trust that it is accurate or they will not change their route of travel. Unless facilities for real-time data collection are provided in the contract or delays are visually confirmed by the Engineer or District Traffic office, the Traffic Management Center will provide this type of information and may recommend the corresponding messages. Identification of alternate routes must be coordinated with District Traffic. Local routes will not be used as alternates without the prior approval by the agency of jurisdiction.

   Examples:

   - Real-time travel delay; allowing motorists to consider an alternate route

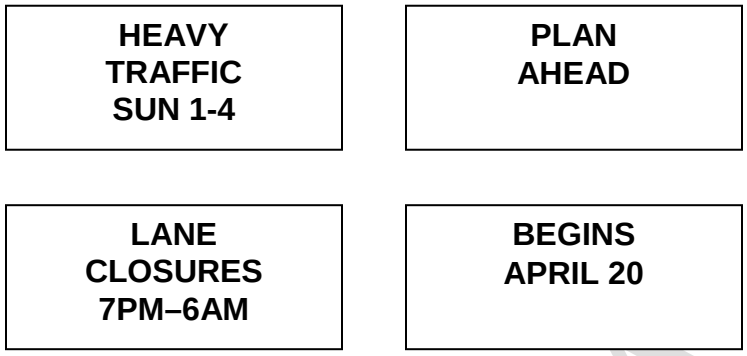
- Suggested alternate route(s)
- Combination of the above
- Suggested routes to a large traffic generator
- Amber Alerts (these alerts are provided only through the TMC).



5. **Advance Notice of Special Events**– If a planned event such as a road/ramp/lane closing is expected to occur, motorists should be warned ahead of time to avoid that area during the event.

   Examples:

   - Large, traffic-generating sports event
   - Scheduled lane closure with a heavy traffic impact



6. **Public Information Pertinent to Highway Safety**– This type of message requires an action by drivers and shall only be displayed with the District Traffic/Maintenance & Operations Engineer's or their designee's approval. The intended use for this message type is to improve safety and mobility, and to reduce congestion.

   Example:

   - License, DUI, seat-belt or weight check by law enforcement.

Section V. MESSAGE SELECTION & NON STANDARD MESSAGE DEVELOPMENT

To promote consistency in INDOT work zones, pre-approved, standard messages are provided on pages 20 - 23.

The Designer, District Technical Services Office, or Traffic Management Center will create non-standard messages. The Traffic Management Centers and the Work Zone Safety Section may be consulted for advice on non-standard messages. For contracted work a "Programming Sheet for Changeable Message Sign Use" will be included in the special provisions for each non-standard message identified in the maintenance of traffic plans.

Components of a Message

When designing a message, enough information needs to be given to the motorists to enable them to react and possibly make a decision. If this is not done, the message may be ignored. The message can be broken down into the 5 W's (what, where, when, who and why). All of these components are not necessarily needed for each and every message. They may often be implied. Generally the message can address any of the following:

- **What** action should be taken
- **Where/When** is the event
- **Who** is affected
- **Why** the action is needed

If a message or element of a message is not addressing one or more of these points then it should not be used.

What? – What action is required by the motorist?

- This is the instruction you want motorists to follow. It could be to reduce speed, divert to a specific route, begin to merge, etc. The motorists will tend to ignore a simple WHAT statement unless they are also given a WHY. Motorists need to have as much information as possible so they can make an informed decision.

- The WHAT component of a message may be implied. The following future event message is an example:

  This message gives the motorists a WHY and WHEN, but it implies that they need to plan to be elsewhere at that time. If the driver population is very familiar with an area, a WHY and WHERE may be given as:

  This implies that motorists must find an alternate route for Keystone Avenue.

The WHAT component is the most important piece of information given that will affect drivers' decisions. They must be clear, comprehensible and recognizable. For example:

WHAT:	DETOUR EXIT 247	WHY:	ROAD CLOSED

WHATs include MERGE RIGHT, MERGE LEFT, KEEP RIGHT, KEEP LEFT, PREPARE TO STOP, REDUCE SPEED, DO NOT PASS, STAY IN LANE, SLOW TO xx MPH, STAY IN VEHICLE, TUNE RADIO 530 AM, EXIT 1 MILE, FOLLOW DETOUR, FOLLOW ALT ROUTE, etc..

- **Where?** – Where is the decision point at which motorists must take an action. The following guidelines should be observed on WHERE messages:

    1. When giving a location, only use major points of reference such as exit numbers. Interchange names may be use in combination with an exit number. Overpass or underpass names should not be used.

    2. When the majority of motorists are interstate travelers who are not familiar with the names of local cross-streets, locations should be described in distances to the nearest ½ mile.

    3. If the majority of motorists are local, use the local street names. Most urban drivers are more familiar with street names than route numbers, SR numbers, mile markers, or reference markers.

    4. AHEAD is not a WHERE; it's a filler word. For notices of an incident, lane closure or heavy congestion, an actual distance should be given instead of just the word AHEAD. This will give the driver a point of reference and the opportunity to divert based on the driver's knowledge of the area.

    WHERE includes xx MILES, AT MOREHEAD ST., NEAR (LANDMARK), EXITS xx TO xx.

- **When?** – When will an event occur for which drivers should change their actions?

    For future events, give specific data for its traffic disruption only if it is certain to occur. The PCMS's will lose their credibility if they advertise traffic conditions that never occur. An example is a major, traffic-generating sports event. Do not make the message specific if real time information cannot be kept current. This type of message is usually required to be combined with a WHERE.

An example of a **message not to display** is:

ROAD OPENS 21 DAYS

The road may not open as planned. WHEN can be a date, time, holiday, or weekend.

- **Who?** – If only a partial audience is required to take an action, who are they?

  A partial audience could potentially include:

  1. Over-width vehicles.

  2. Motorists with a particular destination; such as in a secondary road or ramp closure detour situation.

  3. Traffic en-route to a specific event such as:

GAME TRAFFIC	**USE LEFT LANES**

  WHO includes ALL TRAFFIC, THRU TRAFFIC, CARS, TRUCKS, BUSES, WIDELOAD, EMER VEH/ONLY, highway/road name with a direction, LOCAL/TRAFFIC, etc.. Downstream cities and destinations (e.g. CHICAGO TRAFFIC) identify an audience also.

- **Why?** – Additional information to assist and/or spur motorists' decision making.

  This is intended to encourage motorists to make a change to their driving and follow the message instruction. The following are examples:

AVOID 20 MIN DELAY	**USE US 20 TO BEACH**

REDUCE SPEED	**WATER ON ROAD**

Without the WHY statements the motorists will most likely ignore the instruction, but with the additional information they will make an informed decision. WHY includes LEFT LANE CLOSED, RIGHT LANE CLOSED, RAMP CLOSED, xx MILE BACKUP, xx MIN DELAY, SLOW TRAFFIC, RIGHT SHOULDER CLOSED, EXPECT DELAYS.

Word Usage

Avoid filler words such as AHEAD or CAUTION. Both of these words can be implied in most instances. Drivers will realize that if you are giving a warning you are also advising caution. They will also assume that they would only be advised of situations ahead of them. However, there are times where AHEAD is beneficial as it can differentiate between the distance to a lane restriction versus the length of a lane restriction. For example, RIGHT/LANE /CLOSED|5 MILES/AHEAD makes it clear that the right lane is closed 5 miles ahead, not that the right lane is closed for 5 miles. The word, TRAFFIC, when addressing a specific audience, may be deleted when space considerations do not allow.

When using more than one phase, repeat key words. Do not use potentially contradictory terms. For instance both LEFT and RIGHT should not be used in the same sequence, such as RIGHT/LANE/CLOSED|MERGE LEFT. Inattentive drivers will scramble the message.
A better message is RIGHT/LANE/CLOSED|PREPARE/TO/ MERGE or the basic standard message (no 13) RIGHT/LANE/CLOSED.

Use vocabulary familiar to the driver population. Express Lanes, for instance, are not utilized in Indiana except in Chicago and Indianapolis metro areas, so the message THRU/TRAFFIC|USE/ EXPRESS/LANE could be confusing outside of those locales.

The use of abbreviations should be kept at a minimum. When space will not allow all key words to be spelled out the standard abbreviations found on pages 16-18 should be used.

Additional requirements for PCMS messages

The standards and guidelines found in the Manual on Uniform Traffic Control Devices (MUTCD) regarding portable changeable message signs shall be observed. Only upper case letters shall be used. Alternating a line and leaving the other lines the same between the first and second phase of a two phase message is not permissible.

Limits to message size

At normal highway speeds motorists are limited in the amount of information they can read on one sign. This was recognized in the current MUTCD in which greater limits have been placed on message size. As a result it is INDOT's policy to limit the amount of information displayed on a PCMS per the MUTCD and as follows:

- A maximum of 8 characters per line (including spaces) shall be used
- PCMS's shall display no more than 3 lines per phase
- No more than two phases per message. One phase should be used when possible.
- When two phases are used to create a message each phase should be understandable on its own
- Each phase should be limited to three units of information (or data items used for decision making). As an example standard message #1 (see page 20) consists of 1 phase with two units of information- the first unit is "ROAD WORK" the second is "XX MILES"
- Each message should be limited to 4 units of information

If the message exceeds these limitations then the amount of information in the message should be reduced by deleting the least significant or the lowest priority information. In general the priority based on type of information is:

1 Why
2 Where
3 When (if applicable)
4 What (may be implied in many instances)
5 Who (if applicable)

Multiple Messages

It may be necessary to relay multiple pieces of information to motorists. This can be accomplished by careful message design. For instance, if a segment of I-70 is closed due to an overhead bridge collapse; a priority 1 message will result. If, at the same time, the truck that hit the bridge is on fire and billowing smoke on to the alternate

route, I-465, a priority 3 message may be necessary. In the following example, three phases are used to inform motorists that there is an emergency requiring action on their part and to warn of a potentially hazardous condition that could be encountered after taking the action.

I-70 CLOSED EXIT 90	**DETOUR EXIT 90**	**EXPECT HEAVY SMOKE**

Three phases should only be used if there is no reasonable way to convey critical information on two. When three phases are needed multiple PCMS's should be used in series to convey the message in order to satisfy the MUTCD and INDOT policy regarding the maximum number of phases per message.

Approval of Non-Priority Messages

PCMS's shall only display messages that pertain to highway safety or congestion. Special use of PCMS may be requested by the Commissioner, Deputy Commissioner, Traffic Management, or the District Deputy Commissioner, but messages must still conform to policy and special messages must be approved by the District Traffic Engineer.

Message Types to Avoid

Message types that are not permitted:

1. PCMS's shall not display messages that in any way advertise commercial events or entities. An example of a **message not to display** is:

RCA CHMPSHPS TRAFFIC	**USE EXIT 79A**

An acceptable message is:

TENNIS TRAFFIC	**USE EXIT 79A**

Although the same information is relayed, no names are used. This awareness will prevent businesses from being able to accuse INDOT of advertising their competitors.

The placement of advertisements in advance notification messages should also be avoided. The following is a message warning motorists of expected heavy traffic due to a planned athletic event. INDOT cannot be accused of advertising the event or any of its teams because this message does not include names.

HEAVY TRAFFIC SUN 1-4	**USE ALT ROUTE US 40**

2. PCMS's should not be used to convey a message for an extended period of time, approximately two weeks or more, that could be conveyed with a conventional warning or guide sign. An example of this is ROAD/WORK/AHEAD being displayed for more than two weeks while the standard construction sign could have been used.

3. PCMS's should not display generic messages that convey non specific information about the work zone or road conditions (e.g. CAUTION/CAUTION/CAUTION).

Section VI. STANDARD ABBREVIATIONS

These easily understood Standard abbreviations may be used:

TABLE IV: STANDARD ABBREVIATIONS

Word	Abbr.	Word	Abbr.
Afternoon/Evening	PM	Lane	LN
Alternate	ALT	Left	LFT
Avenue	AVE/AV	Maintenance	MAINT
Bicycle	BIKE	Morning	AM
Boulevard	BLVD	Normal	NORM
Cannot	CANT	Northbound	N-BND
CB Radio	CB	Parking	PKING
Center	CNTR	Right	RHT
Circle	CIR	Road	RD
Crossing	XING	Route	RTE

Do Not	DONT	Service	SERV
Eastbound	E-BND	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Entrance, Enter	ENT	Southbound	S-BND
Expressway	EXPWY	Speed	SPD
Feet	FT	Street	ST
Freeway	FRWY, FWY	Temporary	TEMP
Hazardous	HAZ	Traffic	TRAF
Highway	HWY	Travelers	TRVLRS
Hour(s)	HR	Vehicle	VEH
Information	INFO	Warning	WARN
It Is	ITS	Westbound	W-BND
Junction	JCT	Will Not	WONT

Other abbreviations may be used with approval of the District Traffic/Maintenance & Operations Engineer.

Other abbreviations are easily understood whenever they appear in conjunction with a particular word commonly associated with it. These words and abbreviations are as follows:

TABLE V: ABBREVIATIONS ACCEPTABLE WITH PROMPT WORD

Word	**Abbr.**	**Prompt**
Ahead	AHD	Fog*
Blocked	BLKD	Lane
Bridge	BRDG	[Name]
Chemical	CHEM	Spill
Condition	COND	Traffic*
Congested	CONG	Traffic*
Construction	CONST	Ahead
Downtown	DWNTN	Traffic
Exit	EX, EXT	Next
Frontage	FRNTG	Road
Interstate	I	[Number]
Major	MAJ	Crash
Mile(s)	MI	[Number]*
Minor	MNR	Crash
Oversized	OVRSZ	Load
Minute(s)	MIN	[Number]*

Prepare	PREP	To Stop
Pavement	PVMT	Wet*
Quality	QLTY	Air*
Roadwork	RDWK	Ahead [Distance]
Route	RTE	Best*
Vehicle	VEH	Stalled*
Cardinal Directions	N, E, S, W	[Number]*

* These prompt words should precede the abbreviation.

TABLE VI: ABBREVIATIONS THAT ARE UNACCEPTABLE

Abbreviation	Intended Word	Common Misinterpretations
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

Section VII. STANDARD MESSAGES

The following table lists messages that are considered standard and as such may be displayed when appropriate without authorization as specified in the "AUTHORITY AND RESPONSIBILITIES" section on page 2:

TABLE VII: STANDARD MESSAGES

Number	First Phase Line 1/Line 2/ Line 3	Second Phase Line 1/Line 2/ Line 3
1	ROAD/WORK/xx MILES	n/a
2	WORK/ZONE/xx MILES	n/a

3	NIGHT/WORK/xx MILES	n/a
4	DETOUR/xx MILES	n/a
5	MEDIAN/WORK/xx MILES	n/a
6	SIGNAL/xx MILES	n/a
7	CRASH/xx MILES	n/a
8	YIELD/xx MILES	n/a
9	STOP/xx MILES	n/a
10	WATER/ON/ROAD	n/a
11	FOG/xx MILES	n/a
12	FLAGGER/xx MILES	n/a
13	RIGHT/LANE/CLOSED	n/a
14	LEFT/LANE/CLOSED	n/a
15	CENTER/LANE/CLOSED	n/a
16	RIGHT 2/LANES/CLOSED	n/a
17	LEFT 2/LANES/CLOSED	n/a
18	MERGE/xx MILES	n/a
19	MERGE/LEFT	n/a
20	MERGE/RIGHT	n/a
21	KEEP/LEFT	n/a
22	RIGHT/LANE/NARROWS	n/a
23	KEEP/RIGHT	n/a
24	PASS/LEFT	n/a
25	PASS/RIGHT	n/a
26	TRUCK/CROSSING	n/a
27	ROAD/CLOSED/xx MILES	n/a
28	ALL/TRAFFIC/EXIT RHT	n/a
29	CRASH/AHEAD/SLOW	n/a
30	USE/LEFT/LANE	n/a
31	USE/RIGHT/LANE	n/a
32	DO/NOT/PASS	n/a
33	ROAD/CLOSED/xx MILES	n/a
34	ROAD/WORK/xx MILES	RIGHT/LANE/CLOSED
35	ROAD/WORK/xx MILES	RIGHT 2/LANES/CLOSED
36	ROAD/WORK/xx MILES	LEFT/LANE/CLOSED
37	ROAD/WORK/xx MILES	LEFT 2/LANES/CLOSED
38	ROAD/WORK/xx MILES	CENTER/LANE/CLOSED
39	WORK/ZONE/xx MILES	RIGHT/LANE/CLOSED
40	WORK/ZONE/xx MILES	RIGHT 2/LANES/CLOSED
41	WORK/ZONE/xx MILES	LEFT/LANE/CLOSED
42	WORK/ZONE/xx MILES	LEFT 2/LANES/CLOSED
43	WORK/ZONE/xx MILES	CENTER/LANE/CLOSED
44	NIGHT/WORK/xx MILES	RIGHT/LANE/CLOSED

45	NIGHT/WORK/xx MILES	RIGHT 2/LANES/CLOSED
46	NIGHT/WORK/xx MILES	LEFT/LANE/CLOSED
47	NIGHT/WORK/xx MILES	LEFT 2/LANES/CLOSED
48	NIGHT/WORK/xx MILES	CENTER/LANE/CLOSED
*49	RIGHT/LANE/CLOSED	PREPARE/TO/STOP
*50	LEFT/LANE/CLOSED	PREPARE/TO/STOP
*51	CENTER/LANE/CLOSED	PREPARE/TO/STOP
*52	RIGHT 2/LANES/CLOSED	PREPARE/TO/STOP
*53	LEFT 2/LANES/CLOSED	PREPARE/TO/STOP
54	CRASH/AHEAD	DETOUR/AT/EXIT xxx
55	CRASH/ON/BRIDGE	DETOUR/AT/EXIT xxx
56	CRASH/AT/EXIT xxx	FOLLOW/DETOUR/EXIT xxx
57	CRASH/AT/EXIT xxx	PASS ON/RIGHT/SHOULDER
58	CRASH/AT/EXIT xxx	SLOW/MOVING/TRAFFIC
59	CRASH/AT/EXIT xxx	ALL/LANES/CLOSED
60	CRASH/AT/EXIT xxx	RIGHT/LANE/CLOSED
61	CRASH/AT/EXIT xxx	RIGHT 2/LANES/CLOSED
62	CRASH/AT/EXIT xxx	LEFT/LANE/CLOSED
63	CRASH/AT/EXIT xxx	LEFT 2/LANES/CLOSED
64	CRASH/AT/EXIT xxx	CENTER/LANE/CLOSED
65	CRASH/AT/MILE xxx	FOLLOW/DETOUR/EXIT xxx
66	CRASH/AT/MILE xxx	PASS ON/RIGHT/SHOULDER
67	CRASH/AT/MILE xxx	SLOW/MOVING/TRAFFIC
68	CRASH/AT/MILE xxx	ALL/LANES/CLOSED
69	CRASH/AT/MILE xxx	RIGHT/LANE/CLOSED
70	CRASH/AT/MILE xxx	RIGHT 2/LANES/CLOSED
71	CRASH/AT/MILE xxx	LEFT/LANE/CLOSED
72	CRASH/AT/MILE xxx	LEFT 2/LANES/CLOSED
73	CRASH/AT/MILE xxx	CENTER/LANE/CLOSED
74	ROAD/CLOSED	USE/DETOUR/EXIT xxx
75	ROAD/CLOSED/*DATE*	USE/EXIT xxx
76	BRIDGE/CLOSED	USE/DETOUR/EXIT xxx
77	BRIDGE/CLOSED/*DATE*	USE/EXIT xxx
78	EVENT/TRAFFIC	USE/RIGHT 2/LANES
79	GAME/TRAFFIC	USE/RIGHT/LANE
80	CONCERT/TRAFFIC	FOLLOW/SIGNS
**81	EXIT xx/CLOSED	*DATE (e.g. DEC 4-7)*
**82	EXIT xx/CLOSED	*DAY(S) (e.g. MONDAY)*
83	ICY/BRIDGE	REDUCE/SPEED
84	SLIPPERY/ROAD	REDUCE/SPEED
85	DENSE/FOG	REDUCE/SPEED
86	HIGH/WINDS	REDUCE/SPEED

87	ROAD/FLOODED	REDUCE/SPEED
88	BLOWING/SNOW	REDUCE/SPEED
89	ROAD/FLOODED	SLOW/MOVING/TRAFFIC
90	TRUCK/CROSSING	WATCH/FOR/TRUCKS
91	TRAVEL/ LANE/CLOSED-	USE/SHOULDER
92	LOAD/SPILL	FOLLOW/DETOUR/EXIT xx
93	LANE/MARKING	EXPECT/DELAYS
94	LANE/MARKING	SLOW/MOVING/TRAFFIC
95	LANE/MARKING	LEFT/LANE/CLOSED
96	LANE/MARKING	CENTER/LANE/CLOSED
97	LANE/MARKING	RIGHT/LANE/CLOSED
98	LANE/MARKING	*Duration (e.g. 10AM-3PM)*
***99	TRAFFIC/ADVISORY	TUNE/TO/530 AM (or1610 AM)
100	FLAGGER/AHEAD	PREPARE/TO/STOP
101	ROAD/WORK	SLOW/MOVING/TRAFFIC
102	DEBRIS/ON/ROAD	RIGHT/LANE/BLOCKED
103	DEBRIS/ON/ROAD	CENTER/LANE/BLOCKED
104	DEBRIS/ON/ROAD	LEFT/LANE/BLOCKED
105	DEBRIS/ON/ROAD	MERGE/RIGHT
107	EMER/VEHICLES/AHEAD	MERGE/RIGHT
108	EMER/VEHICLES/AHEAD	MERGE/LEFT
109	NEW/TRAFFIC/PATTERN	LANES/SHIFT/xxx FT
110	EXIT xx/CLOSED	DETOUR/xxMILES/AHEAD
111	EXIT xx/RAMP/CLOSED	FOLLOW/DETOUR/EXIT xx

Notes:

* Messages 49 through 53 should be use only during times when queuing is occurring Queuing can be detected by real time technologies, observed by personnel on site, or by inference as queuing has been previously detected or observed at the same location during the same time of day and day of week.

** Message #81 is preferred when displayed 7 days or more in advance or when the closure will be longer than one week. Message #82 is preferable when the closure will occur within 7 days.

*** The use of message #99 must be coordinated with the Traffic Management Center

REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS)

BACKUP 04. PUBLIC-INTEREST FINDING FOR PROPRIETARY-MATERIAL USE

PUBLIC-INTEREST FINDING FOR PROPRIETARY-MATERIAL USE
available at:

http://www.in.gov/dot/div/contracts/standards/sc/2012/apr/AFP Proprietary Use Justification.pdf

COMMENTS AND ACTION (OLD BUSINESS)

801.02 MATERIALS
801.15(b) CHANGEABLE MESSAGE SIGNS
801.17 METHOD OF MEASUREMENT
801.18 BASIS OF PAYMENT
923.05 TEMPORARY WORKSITE SPEED LIMIT SIGN ASSEMBLY
923.06 TUBULAR MARKER
923.07 ACCEPTANCE OF TEMPORARY TRAFFIC CONTROL DEVICES

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: 801.02 pg 694; 801.15 pg 709; 801.17 pg 712, 713; 801.18 pg 716, 718; 923.05 -06,-07 pg 1027. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: SECTION 83-2.06 GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: _____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective ____Letting _____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By _____ Addition or _____ Revision Frequency Manual Update Req'd? Y___N___ By _____ Addition or _____ Revision Received FHWA Approval? _____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The Standard Specifications in sections 714 and 723 do not adequately call out the design requirements for box culverts and three-sided structures.

Further, the precast box culverts and precast three-sided structures are not performing well and are in many situations showing significant amount of calcium carbonate formation due to the infiltration of water containing roadway deicing materials. The leaking joints are jeopardizing the lifespan of these structures.

PROPOSED SOLUTION: The Standard Specification sections 714 and 723 can be amended to call out the proper design sections from AASHTO bridge specifications for three-sided structures and box structures larger than 12 feet and ASTM C 1577 for sizing and loading where that specification is appropriate.

A polychloroprene membrane covering the top and sides of the boxes and three-sided structures will protect the precast units from deterioration.

APPLICABLE STANDARD SPECIFICATIONS: 714 and 723

APPLICABLE STANDARD DRAWINGS: N.A,.

APPLICABLE DESIGN MANUAL SECTION: Culvert Chapter is presently under development

APPLICABLE SECTION OF GIFE: N.A.

APPLICABLE RECURRING SPECIAL PROVISIONS: N.A.

PAY ITEMS AFFECTED: None

Submitted By: Randy Strain

Title: Bridge Standards and Policy Engineer

Organization: INDOT

Phone Number: 317-232-3339

Date: 03/23/2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: This submission has been endorsed by the members of the committee to write the culvert chapter for the design manual.

REVISION TO STANDARD SPECIFICATIONS

SECTION 714 – REINFORCED CONCRETE BOX STRUCTURES
714.02 MATERIALS
714.03 GENERAL REQUIREMENTS
714.04 DESIGN REQUIREMENTS
714.04(a) BOX STRUCTURE
714.04(b) CONCRETE HEADWALLS, WINGWALLS, AND FOOTINGS
714.11 METHOD OF MEASUREMENT

The Standard Specifications are revised as follows:

SECTION 714, BEGIN LINE 13, INSERT AS FOLLOWS:

714.02 Materials

Materials shall be in accordance with the following:

Chemical Anchor System	901.05
Coarse Aggregates, Class A or Higher, Size No. 91	904
Concrete	702
Epoxy Coated Reinforcing Bars	910.01
Flowable Backfill	213
Geotextile	918.01 or 918.02
Hydrated Lime	913.04(a)
~~Joint Membrane System for Precast Reinforced Concrete Box Structure Sections~~	~~907.07~~
Masonry Cement	901.01(c)
Membrane System for Precast Reinforced Concrete Box Structure Sections	*906.02(a)*4

SECTION 714, BEGIN LINE 79, DELETE AND INSERT AS FOLLOWS:

714.03 General Requirements

Unless otherwise specified, the applicable requirements of 702 and 703 shall apply to the construction of box structures, structure extensions, and concrete parts of similar structures. Excavation and disposal shall be in accordance with the applicable requirements of 206. ~~Areas designated for waterproofing shall be waterproofed in accordance with 702.23~~. *Each precast box structure built in multiple segments shall be protected by the means of a polychloroprene membrane in accordance with 906.02(a)4. The membrane shall cover the sides and the top of the structure.* All underground drains encountered during excavation for the structure shall be perpetuated as dictated by field conditions. Drainage openings through masonry shall be in accordance with 702.16. Handling of box structures shall be in accordance with 907.05. Handling of wingwalls shall be in accordance with 907.06.

When riprap is specified, geotextile shall 1st be placed on the in-situ soil in accordance with 616.11. Riprap shall then be placed in accordance with 616.

714.04 Design Requirements

REVISION TO STANDARD SPECIFICATIONS

SECTION 714 – REINFORCED CONCRETE BOX STRUCTURES
714.02 MATERIALS
714.03 GENERAL REQUIREMENTS
714.04 DESIGN REQUIREMENTS
714.04(a) BOX STRUCTURE
714.04(b) CONCRETE HEADWALLS, WINGWALLS, AND FOOTINGS
714.11 METHOD OF MEASUREMENT

~~Where reinforcing bars are used, reinforcing bar splicing and spacing~~ *Concrete box structures* shall be *designed* in accordance with the AASHTO LRFD Bridge Design Specifications, *Section 12*, except as modified herein.

(a) Box Structure

A box structure ~~shall~~ *may* be designed in accordance with ~~the methodology presented in~~ ASTM C 1577 *if appropriate with* the following exceptions.

SECTION 714, BEGIN LINE 126, DELETE AND INSERT AS FOLLOWS:

A headwall with ~~bridge railing~~ *guardrail* mounted on top ~~and~~, the anchorage of the headwall to the box structure section, *or a moment slab with bridge railing* shall be designed for the bridge railing test level shown on the plans.

SECTION 714, BEGIN LINE 356, INSERT AS FOLLOWS:

714.11 Method of Measurement

Precast reinforced concrete box structures or structure extensions, precast coated reinforced concrete box structures or structure extensions, *membrane*, precast headwalls, precast wingwalls, cast-in-place reinforced concrete box structures or structure extensions, cast-in-place coated reinforced concrete box structures or structure extensions, cast-in-place headwalls, and cast-in-place wingwalls will not be measured. The accepted quantities for payment will be the quantities shown on the plans.

REVISION TO STANDARD SPECIFICATIONS

SECTION 723 – REINFORCED CONCRETE THREE-SIDED STRUCTURES
723.02 MATERIALS
723.03 GENERAL REQUIREMENTS
723.04 DESIGN REQUIREMENTS
723.17 METHOD OF MEASUREMENT

SECTION 723, BEGIN LINE 19, INSERT AS FOLLOWS:

723.02 Materials

Materials shall be in accordance with the following:

Chemical Anchor System	901.05
Coarse Aggregates, Class A or Higher, Size No. 91	904
Concrete	702
Epoxy Coated Reinforcing Bars	910.01(b)9
Flowable Backfill	213
Geotextile	918.01, 918.02, or 918.03
Hydrated Lime	913.04(a)
Masonry Cement	901.01(c)
Membrane System for Precast Reinforced Concrete Three-Sided Structure Sections	*906.02(a)4*

SECTION 723, BEGIN LINE 94, DELETE AND INSERT AS FOLLOWS:

723.03 General Requirements

Excavation and disposal shall be in accordance with the applicable requirements of 206. ~~The areas designated for waterproofing shall be waterproofed in accordance with 702.23.~~ *Each precast three-sided structure built in multiple segments shall be protected by means of a polychloroprene membrane in accordance with 906.02(a)4. The membrane shall cover the sides and the top of the structure.* All underground drains encountered during excavation for the structure shall be perpetuated as dictated by field conditions. Drainage openings through masonry shall be in accordance with 702.16. Handling of three-sided structures shall be in accordance with 907.05. Handling of wingwalls and spandrel walls shall be in accordance with 907.06.

SECTION 723, BEGIN LINE 119, DELETE AND INSERT AS FOLLOWS:

A headwall with ~~bridge railing~~ *guardrail* mounted on top, ~~and~~ the anchorage of the headwall or spandrel wall to the structure section, *or a moment slab with bridge railing,* shall be designed for the bridge railing test level shown on the plans.

SECTION 723, BEGIN LINE 432, INSERT AS FOLLOWS

723.17 Method of Measurement

Precast reinforced concrete three-sided flat-topped structures or structure extensions, precast reinforced concrete three-sided arch-topped structures or structure extensions, precast reinforced concrete true arch structures or structure extensions, cast-in-place reinforced concrete three-sided flat-topped structures or structure extensions, cast-in-place reinforced concrete three-sided arch-topped structures or structure extensions, ~~and~~ cast-in-place reinforced concrete true arch structures or structure extensions, *and membrane* will not be measured. The accepted quantities for payment will be the quantities shown on the plans.

COMMENTS AND ACTION

714.02 MATERIALS
714.03 GENERAL REQUIREMENTS
714.04 DESIGN REQUIREMENTS
714.04(a) BOX STRUCTURE
714.04(b) CONCRETE HEADWALLS, WINGWALLS, AND FOOTINGS
714.11 METHOD OF MEASUREMENT
723.02 MATERIALS
723.03 GENERAL REQUIREMENTS
723.04 DESIGN REQUIREMENTS
723.17 METHOD OF MEASUREMENT

Motion:
Second:
Ayes:
Nays:

Action:
____ Passed as Submitted
____ Passed as Revised
____ Withdrawn

Standard Specifications Sections affected:

714.02 pg 588; 714.03 pg 589; 714.04 pg 589, 590; 714.11 pg 595; 723.02 pg 649; 723.03 pg 650; 723.04 pg 651; 723.17 pg 658.

Recurring Special Provision affected:

NONE

Standard Sheets affected:

NONE

Design Manual Sections affected:

(IN DEVELOPMENT)

GIFE Sections cross-references:

NONE

____ 20__ Standard Specifications Book
____ Revise Pay Items List

____ Create RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

____ Revise RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

Standard Drawing Effective ____
____ Create RPD (No. ____)
Effective ____Letting
____ Technical Advisory

GIFE Update Req'd.? Y ___ N ___
By ____ Addition or ____ Revision

Frequency Manual Update Req'd? Y__N__
By ____ Addition or ____ Revision

Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: (1) Some of the WRONG WAY RAMP ARROW dimensions shown in the standard drawing are incorrect and do not match the MUTCD (Figure 3B-24) and the Standard Highway Signs and Markings Book.

(2) The typical spacing between the two arrows for bi-directional left turn lane marking needs to be changed from 32' to 8' minimum -16' maximum to be match the new MUTCD (Figure 3B-7).

PROPOSED SOLUTION: (1) All the dimensions of the WRONG WAY RAMP ARROW have been corrected.

(2) The standard drawing for bi-directional left turn lane markings has been revised to show the new typical spacing.

APPLICABLE STANDARD SPECIFICATIONS: N/A

APPLICABLE STANDARD DRAWINGS: (1) 808-MKPM-01
(2) 808-MKPM-06

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED: N/A

Submitted By: David Boruff

Title: Manager, Traffic Administration Section

Organization: INDOT

Phone Number: 317-234-7975

Date: 3/21/12

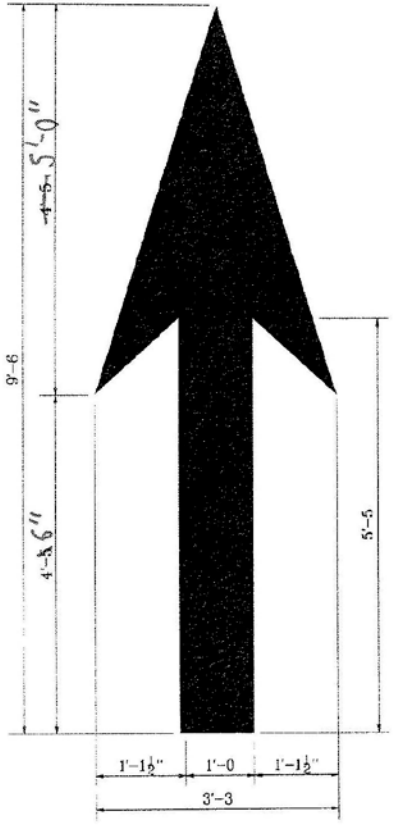
APPLICABLE SUB-COMMITTEE ENDORSEMENT:

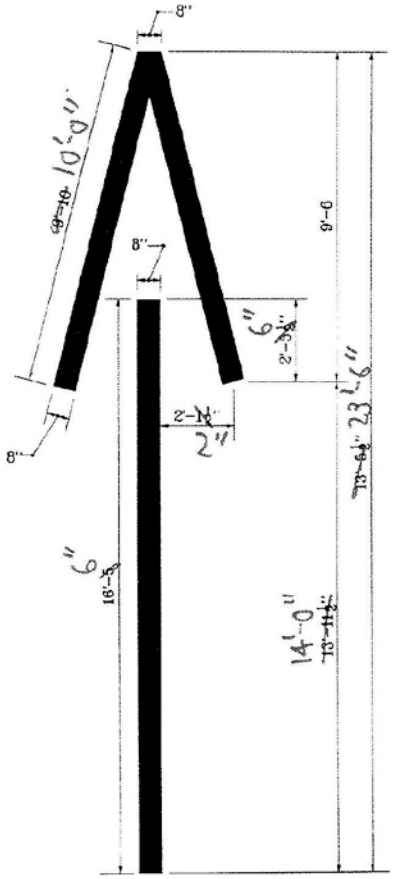
REVISION TO STANDARD DRAWINGS

EXISTING 808-MKPM-01 TRANSVERSE MARKINGS (WITH MARKUPS)

GENERAL NOTES

1. The tip of the lane indication arrow shall be 20 ft in advance of the nearest edge of the stop line.





WRONG WAY RAMP ARROW

INDIANA DEPARTMENT OF TRANSPORTATION

TRANSVERSE MARKINGS

MARCH 1995

STANDARD DRAWING NO. E 808-MKPM-01

DETAILS PLACED IN THIS FORMAT 7-27-99

ANTHONY L. UREMOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Anthony L. Uremovich 7-27-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 7-27-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

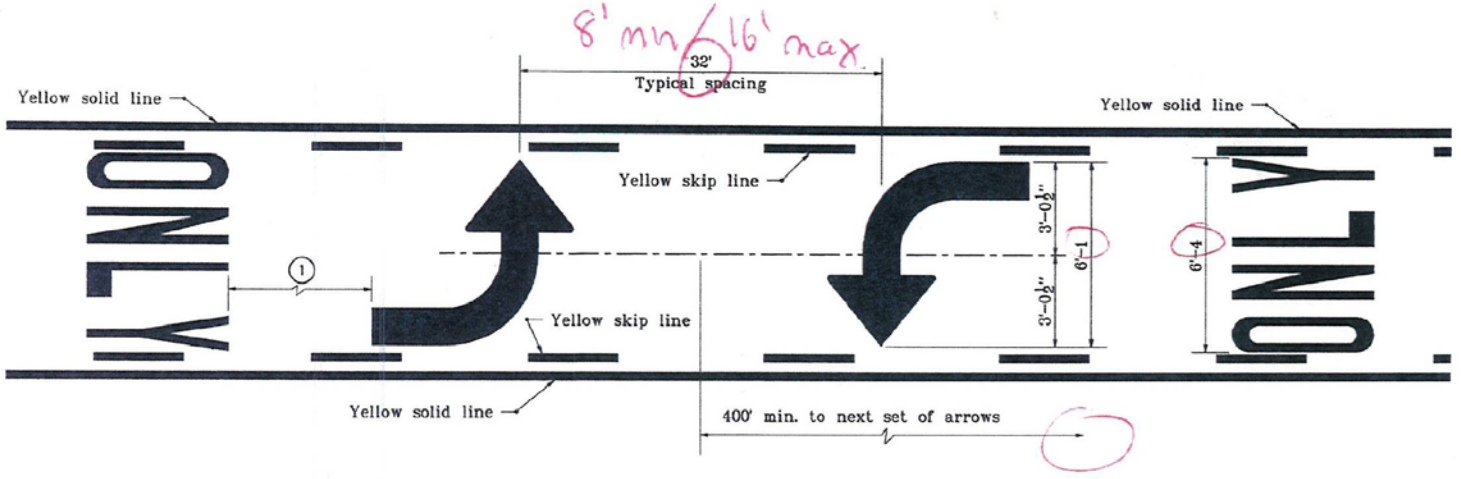
ORIGINALLY APPROVED 3-01-95

REVISION TO STANDARD DRAWINGS

EXISTING 808-MKPM-06 PAVEMENT MARKING DETAILS (WITH MARKUPS)

GENERAL NOTES

(1) This dimension shall be at least 4 times the height of the characters of "ONLY" for the posted speeds ≤ 45 mph but not more than 10 times the height of the characters of the "ONLY" for posted speeds > 45 mph.



PAVEMENT MARKING FOR BI-DIRECTIONAL LEFT TURN LANE (WORD AND SYMBOL MARKINGS)

INDIANA DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING DETAILS

JANUARY 2000

STANDARD DRAWING NO E 808-MKPM-06

ANTHONY L. URKOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

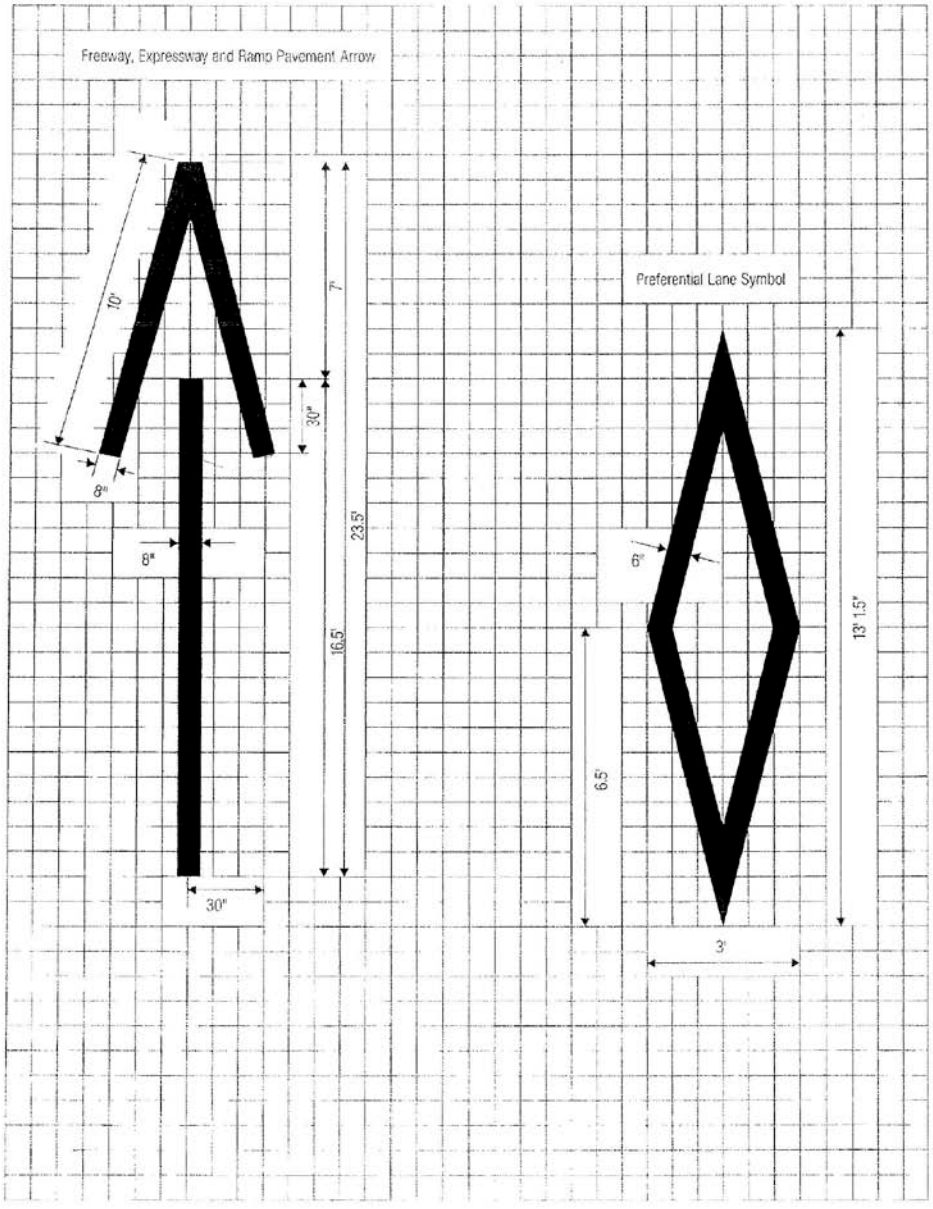
DESIGN STANDARDS ENGINEER

/s/ Anthony L. Urkovich 1-03-00
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 1-03-00
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

BACKUP 01. STANDARD HIGHWAY SIGN BOOK. EDITION 2004, PAGE 10-12



10-12

COMMENTS AND ACTION

808-MKPM-01 TRANSVERSE MARKINGS
808-MKPM-06 PAVEMENT MARKING DETAILS

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: 808-MKPM-01 808-MKPM-06 Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The reinforced concrete bridge approach standard drawings contain substandard drawings that need to be revised. Further, the standard approach doesn't seem to be an item used by designers. The standard approach doesn't actually fit the majority of the bridges, and over time, designers have become very reluctant to use a standard approach.

PROPOSED SOLUTION: The drawings can be modified to more clearly convey the intent of the standard drawing. It is proposed that the standard approach be deleted from the Standards. Designers prefer to detail the reinforced concrete bridge approach in the plans.

APPLICABLE STANDARD SPECIFICATIONS: 609

APPLICABLE STANDARD DRAWINGS:

Standard Drawing	Proposed Change
609-RCBA-01	Delete
609-RCBA-02	Revise designation to 503-BATJ-01
609-RCBA-03	Delete and convert information to Design Manual Figure 17-5G(1)
609-RCBA-04	Delete and convert information to Design Manual Figure 17-5G(2)
609-RCBA-05	Delete
609-RCBA-06	Delete
609-RCBA-07	Revise and change designation to 609-RCBA-01

APPLICABLE DESIGN MANUAL SECTION: 17-5.09

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: none

Submitted By: Randy Strain

Title: Bridge Standards and Policy Engineer

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

Organization: INDOT

Phone Number: 317-232-3339

Date: March 8, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: none

REINFORCED-CONCRETE BRODGE APPROACH

Affects on Standard Drawings

609-RCBA-01	RCBA longitudinal section with HMA approach pavement *Delete, as this is being shown on plans*
609-RCBA-02	RCBA longitudinal section with PCC approach pavement *Revise as shown, and change designation to 503-BATJ-01, to joints series; meaning: Bridge Approach Terminal Joint*
609-RCBA-03	Plan showing reinforcement, square structure *Delete as std dwg, convert to new Design Manual Fig. 17-5G(1)*
609-RCBA-04	Plan showing reinforcement, skewed structure *Delete as std dwg, convert to new Design Manual Fig. 17-5G(2)*
609-RCBA-05	Bill of materials, square structure *Delete, as this is being shown on plans*
609-RCBA-06	Bill of materials, skewed structure *Delete, as this is being shown on plans*
609-RCBA-07	Pavement-ledge detail *Revise as shown, and change designation to 609-RCBA-01*

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

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

The Standard Specifications are revised as follows:

SECTION 609, BEGIN LINE 123, INSERT AS FOLLOWS:

609.13 Method of Measurement

Reinforced concrete bridge approaches, *including extensions required for bridge railing transitions,* will be measured by the square yard ~~(square meter)~~. Dense graded subbase will be measured in accordance with 302.08. Reinforcing bars will be measured in accordance with 703.07.

Subgrade preparation will not be measured for payment. Finishing and curing of the RCBA will not be measured for payment. Construction joints or type I-A joints will not be measured.

609.14 Basis of Payment

Reinforced concrete bridge approaches, *including extensions required for bridge railing transitions,* will be paid for at the contract unit price per square yard ~~(square meter)~~. Dense graded subbase will be paid for in accordance with 302.09. Reinforcing bars will be paid for in accordance with 703.08.

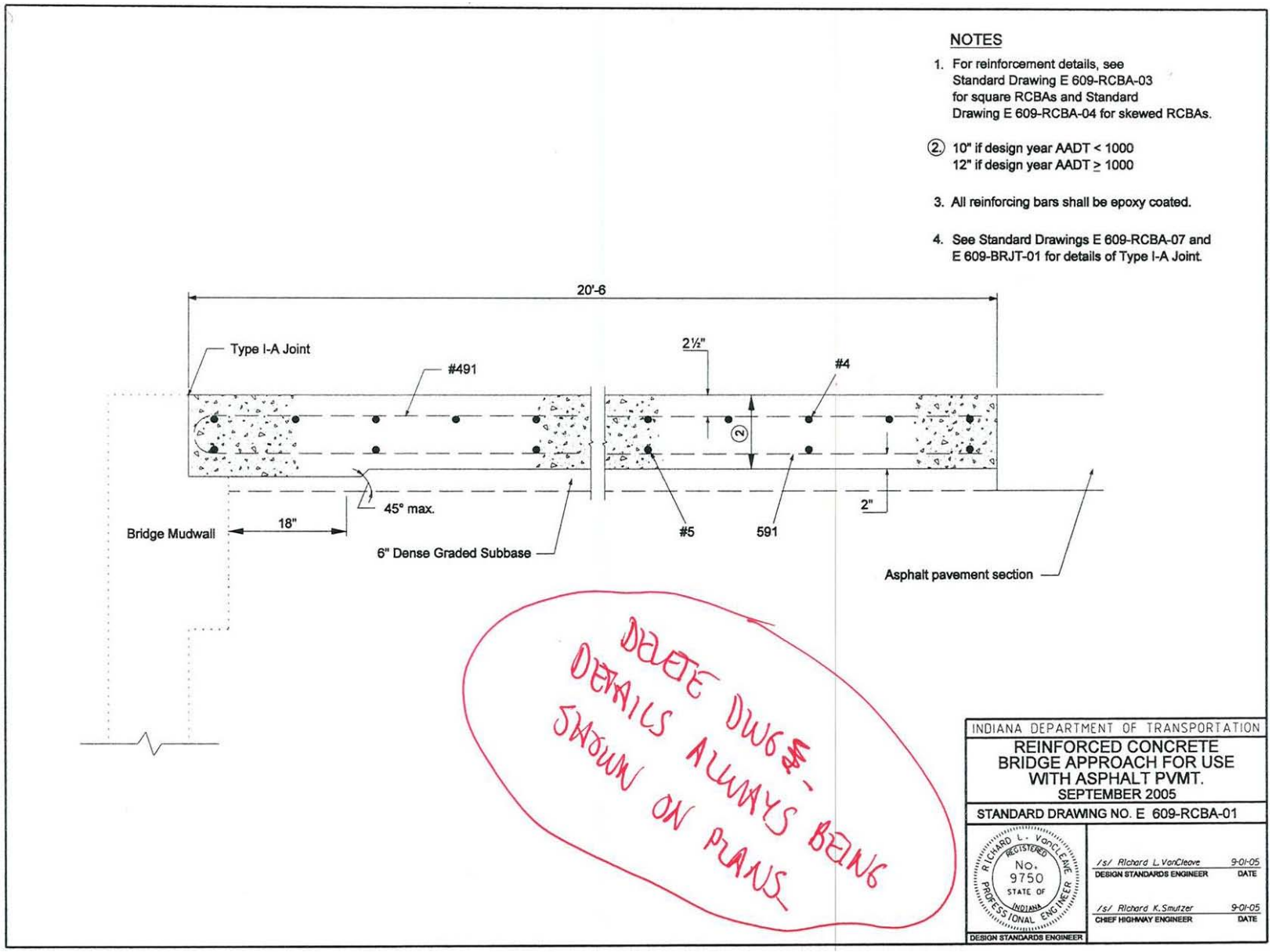
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

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

THIS PAGE INTENTIONALLY LEFT BLANK

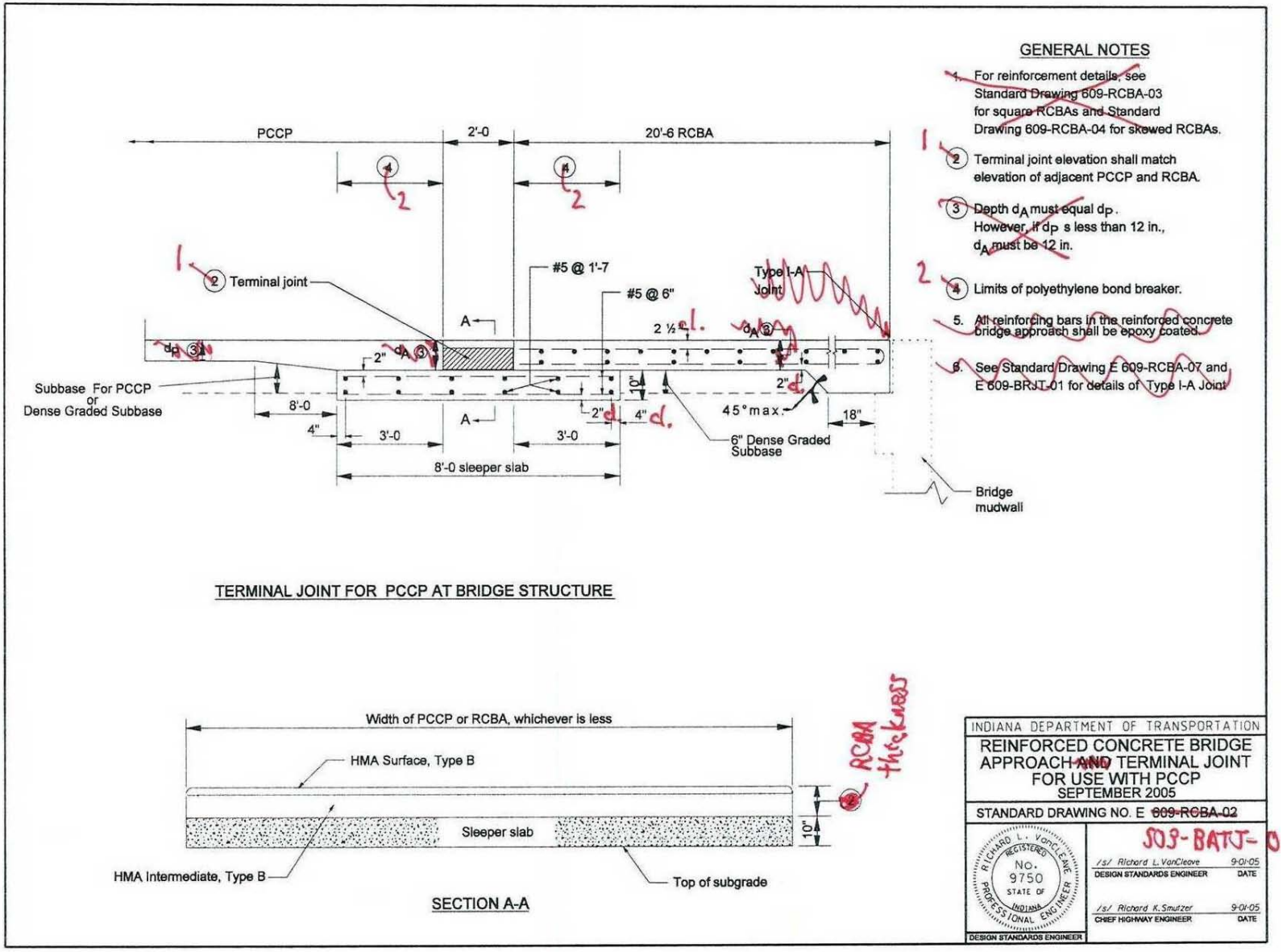
REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-01 REINFORCED CONCRETE BRIDGE APPROACH FOR USE WITH ASPHALT PVMT. (PROPOSED TO DELETE)



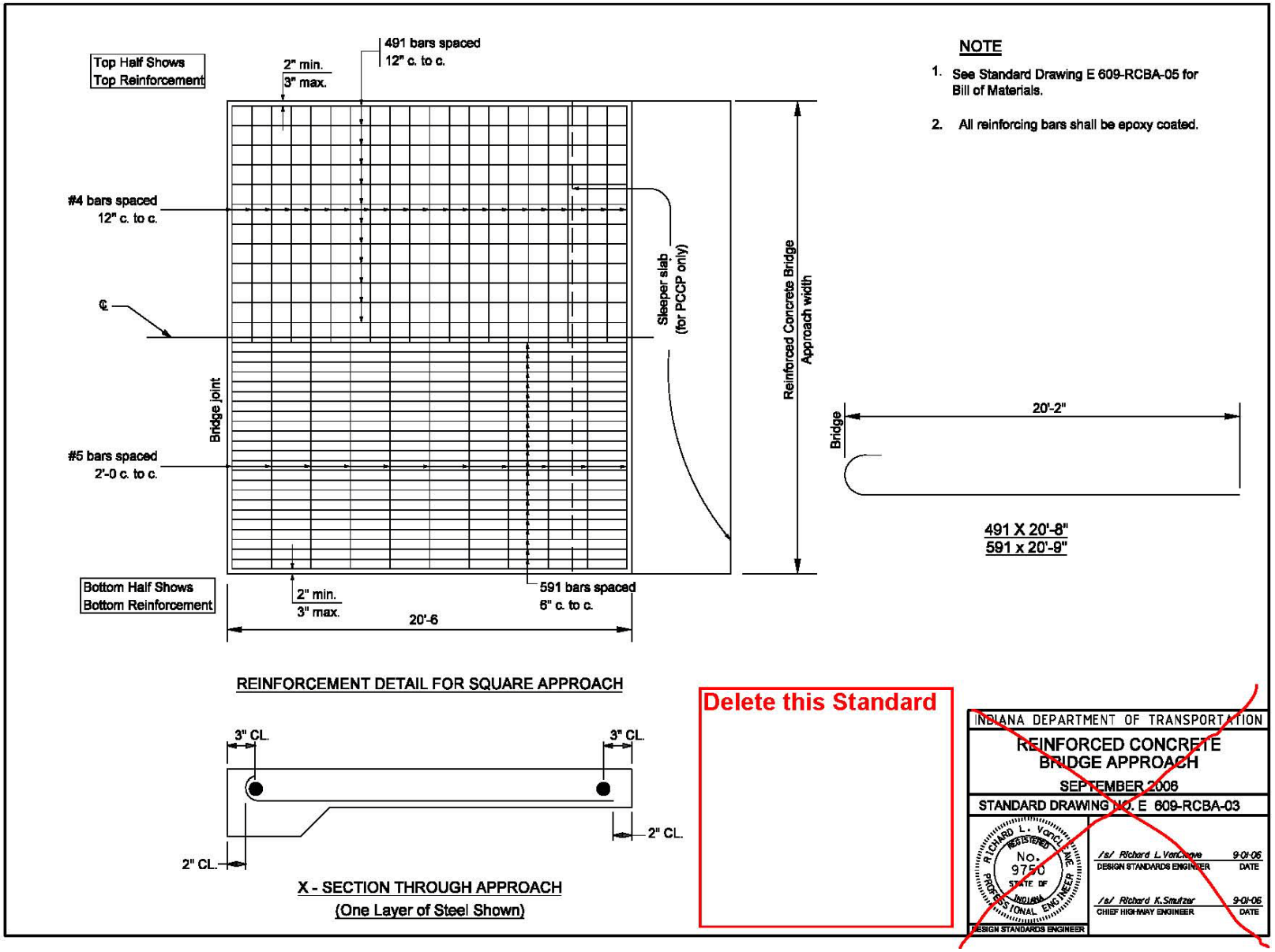
REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-02 REINFORCED CONCRETE BRIDGE APPROACH AND TERMINAL JOINT FOR USE WITH PCCP (WITH MARKUPS)



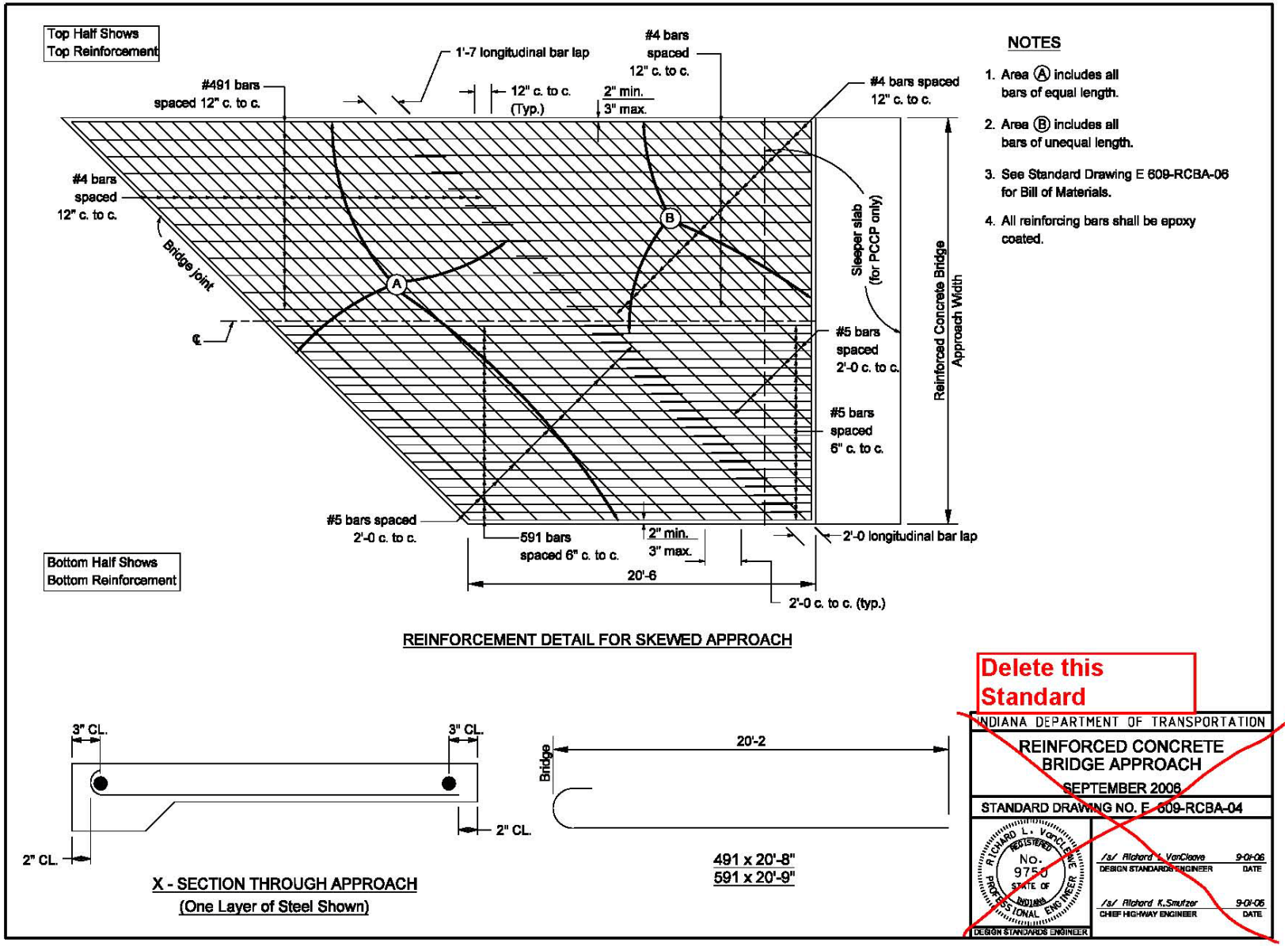
REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH (PROPOSED TO DELETE)



REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH (PROPOSED TO DELETE)



REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-05 REINFORCED CONCRETE BRIDGE APPROACH (PROPOSED TO DELETE)

BILL OF MATERIALS

SQUARE STRUCTURES - ONE SLAB

BRIDGE APPROACH WIDTH	EPOXY COATED REINFORCING BARS				TOTAL WEIGHT LBS.	REINFORCED CONCRETE BRIDGE APPROACH AREA SQ. YDS.
	LONGIT. BARS		TRANSV. BARS			
	NO.	SIZE x LGTH. OR MARK	NO.	SIZE x LGTH.		
24'-0	24	491	21	#4 x 23'-6	1969	54.7
	48	591	11	#5 x 23'-6		
25'-0	26	491	21	#4 x 24'-6	2088	56.9
	51	591	11	#5 x 24'-6		
25'-6	26	491	21	#4 x 25'-0	2122	58.1
	52	591	11	#5 x 25'-0		
27'-0	28	491	21	#4 x 26'-6	2253	61.5
	55	591	11	#5 x 26'-6		
29'-0	30	491	21	#4 x 28'-6	2418	66.1
	59	591	11	#5 x 28'-6		
31'-0	32	491	21	#4 x 30'-6	2583	70.6
	63	591	11	#5 x 30'-6		
33'-0	34	491	21	#4 x 32'-6	2748	75.2
	67	591	11	#5 x 32'-6		
35'-0	36	491	21	#4 x 34'-6	2919	79.7
	71	591	11	#5 x 34'-6		
37'-0	38	491	21	#4 x 36'-6	3079	84.3
	75	591	11	#5 x 36'-6		
39'-0	40	491	21	#4 x 38'-6	3244	88.8
	79	591	11	#5 x 38'-6		
40'-0	41	491	21	#4 x 39'-6	3326	91.1
	81	591	11	#5 x 39'-6		
42'-0	42	491	42	#4 x 21'-9 *	3485	95.7
	83	591	22	#5 x 21'-9 **		
44'-0	46	491	42	#4 x 22'-9 *	3764	100.2
	91	591	22	#5 x 22'-9 **		

* Bars lapped 1'-7 at centerline of roadway. ** Bars lapped 2'-0 at centerline of roadway.

NOTES

1. The Bill of Materials shall be used to determine the bar lengths, total mass of steel, and bridge approach area for square structures.
2. For details, see Standard Drawing E 609-RCBA-03.

Delete Dwg - Bill is Always Being Shown on Plans

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH

SEPTEMBER 2006

STANDARD DRAWING NO. E 609-RCBA-05

RICHARD L. VanCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Richard L.VanCleave 9-01-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K.Smutzer 9-01-06
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-06 REINFORCED CONCRETE BRIDGE APPROACH (PROPOSED TO DELETE)

BILL OF MATERIALS
SKEWED STRUCTURES - ONE SLAB

BRIDGE APPROACH WIDTH	EPOXY COATED REINFORCING BARS			
	LONGIT. BARS, AREA Ⓐ		TRANSV. BARS. AREA Ⓐ	
	NO.	SIZE x LGTH. OR MARK	NO.	SIZE
24'-0	24	491	21	#4
	48	591	11	#5
25'-0	26	491	21	#4
	51	591	11	#5
25'-0	26	491	21	#4
	52	591	11	#5
27'-0	28	491	21	#4
	55	591	11	#5
29'-0	30	491	21	#4
	59	591	11	#5
31'-0	32	491	21	#4
	63	591	11	#5
33'-0	34	491	21	#4
	67	591	11	#5
35'-0	36	491	21	#4
	71	591	11	#5
37'-0	38	491	21	#4
	75	591	11	#5
39'-0	40	491	21	#4
	79	591	11	#5
40'-0	41	491	21	#4
	81	591	11	#5
42'-0	42	491	42	#4 *
	83	591	22	#5 **
44'-0	46	491	42	#4 *
	91	591	22	#5 **

* Bars lapped 1'-7 at centerline of roadway if bar exceeds 40'-0.
** Bars lapped 2'-0 at centerline of roadway if bar exceeds 40'-0.

NOTES

1. The Bill of Materials shall be used to determine the longitudinal bar requirements in Area Ⓐ shown on Standard Drawing E 609-RCBA-04 for skewed structures.
2. See the plans for longitudinal bars required in Area Ⓑ, all transverse bars, total mass of steel and bridge approach area for skewed structures.
3. All reinforcing bars shall be epoxy coated.

DELETE DWG. BILL IS ALWAYS BEING SHOWN ON PLANS.

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH

MARCH 2004

STANDARD DRAWING NO. E 609-RCBA-06

RICHARD L. VANCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

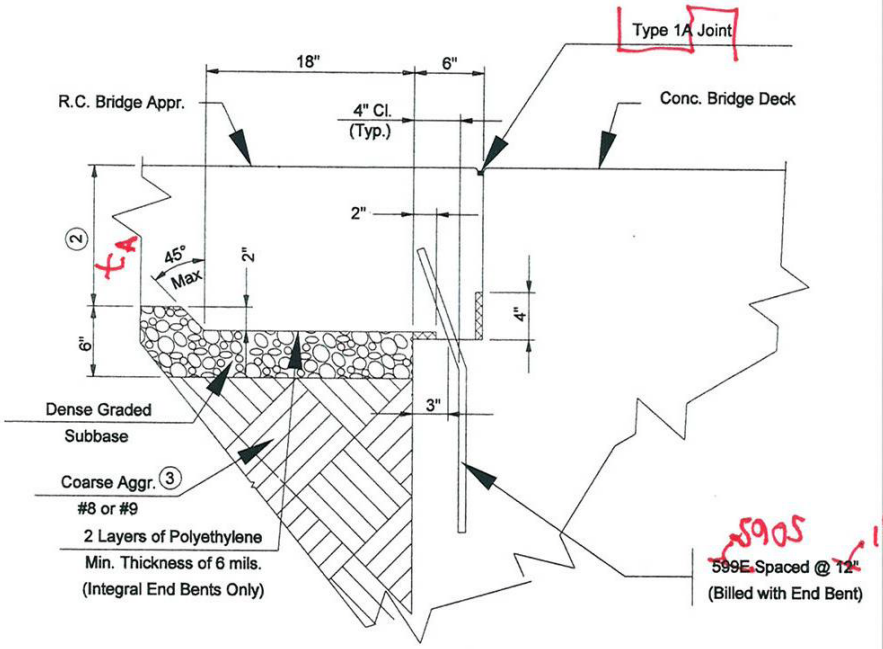
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 3-01-04
DESIGN STANDARDS ENGINEER DATE

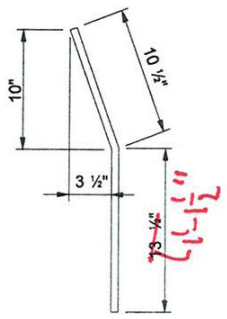
/s/ Richard K. Smutzer 3-01-04
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-07 REINFORCED CONCRETE BRIDGE APPROACH (WITH MARKUPS)



PAVEMENT LEDGE DETAIL



NOTES:

1. See Standard Drawing E-609-BRJT-01 for Type 1A joint details.
2. ~~10" if design year AADT< 1000~~
   ~~12" if design year AADT ≥ 1000~~
   ~~or match thickness of concrete approach pavement if thicker than 12"~~
   See plans for t_A.
3. Flowable backfill if slab bridge.

LEGEND

~~13 mm~~ Expanded Polystyrene, $\frac{1}{2}$ in. thick.

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH
PAVEMENT LEDGE DETAIL
MARCH 2004

STANDARD DRAWING NO. E 609-RCBA-~~07~~ -01

RICHARD L. VanCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 3-01-04
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-04
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

EXISTING 609-RCBA-07 REINFORCED CONCRETE BRIDGE APPROACH (WITH MARKUPS)

THIS PAGE INTENTIONALLY LEFT BLANK

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM 17-5.09 REINFORCED CONCRETE BRIDGE APPROACH (RCBA)

REINFORCED-CONCRETE BRODGE APPROACH
Affects on Design Manual

17-5.09 Reinforced Concrete Bridge Approach (RCBA)

~~**17-5.09(01) Summary of Bridge Quantities**~~

~~Quantities for the following pay items should be included in the Summary of Bridge Quantities table on the Bridge Summary sheet.~~

~~1. PCCP of the required thickness in the RCBA and extensions is measured by the square yard. See the INDOT Standard Drawings for the required RCBA thickness.~~

~~2. Epoxy coated reinforcing steel in the RCBA and extensions is measured by the pound.~~

~~3. Dense-graded subbase placed under the RCBA and extensions is measured by the unit ton.~~

~~**17-5.09(02) RCBA Details**~~

~~The designer may not be able to use the details and bill of materials shown in the INDOT Standard Drawings. The designer should therefore consider providing complete RCBA details on the bridge plans. Complete details should be provided on the plans where the conditions are present as follows:~~

~~1. a bridge that will be constructed in two or more phases;~~

~~2. a bridge where the RCBA width must be sufficient to provide for more than two travel lanes, auxiliary lanes, or a median;~~

~~3. where variable or nonstandard RCBA length, thickness, or details are used; and~~

~~4. where concrete sidewalks, median barrier, center curb, lip gutter, etc. must be accommodated.~~

~~**17-5.09(03) Reinforcing-Steel Quantities**~~

~~Quantities for epoxy-coated reinforcing steel in the RCBA and extensions should be shown separately from other reinforcing-steel quantities in the Summary of Bridge Quantities table. See~~

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM 17-5.09 REINFORCED CONCRETE BRIDGE APPROACH (RCBA) (CONTINUED)

~~the INDOT Standard Drawings for details and material quantities for standard RCBA and extensions.~~

~~The INDOT Standard Drawings provide the dimensions and reinforcement details for a 20.5-ft-long RCBA. The INDOT Standard Drawings also provide the, size, length, and quantity of reinforcing bars for commonly-used RCBA widths. See Figure 17-5G, RCBA Reinforcing Steel Detailing Requirements, for guidance on showing RCBA reinforcing steel details on the plans.~~

17-5.09~~(04)~~ *(01)* Miscellaneous ~~Considerations~~ *Requirements*

~~The designer should also consider the following.~~

1. *Dimensions. The RCBA length, width, skew, thickness, reinforcement, and bill of materials should be determined and shown on the plans. Such information is not shown on the INDOT Standard Drawings. The width should equal the bridge clear-roadway width. The thickness should be determined as shown on Figure 17-5G. Guidance regarding layout and reinforcing-bars placement is shown on Figure 17-5G(1) for a square structure, or Figure 17-5G(2) for a skewed structure. The length and width should be shown on the General Plan sheet.*

~~1~~ *2.* Anchoring. The RCBA should be anchored to the end of the superstructure where integral end bent construction is used. The RCBA should be anchored to the adjacent mudwall where a bridge deck expansion joint is used at the end of the superstructure. See Chapter ~~Sixty-seven~~ *409* for connection details.

~~2~~ *3.* Polyethylene Fabric. Two layers of polyethylene fabric, each of ~~.02 in.~~ minimum thickness *0.02 in.*, should be placed between the ~~concrete bridge approach slab~~ *RCBA* and the subgrade where the RCBA is anchored to the superstructure.

~~3~~ *4.* Terminal Joint. ~~A~~ *If the approach roadway is PCCP, a* terminal joint ~~or pavement relief joint of 2-ft width~~ *as shown on the INDOT Standard Drawings* should be provided at the roadway end of the RCBA ~~if any portion of the adjacent pavement section is PCC~~. No such joint is required if the ~~entire adjacent~~ *approach-roadway* pavement ~~section~~ is HMA.

~~4. Dimensions. The RCBA length, width, and thickness should be shown on the plans. The length and width are typically shown on the General Plan sheet. The RCBA thickness may be shown on a superstructure or end-bent details sheet.~~

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

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM 17-5.09 REINFORCED CONCRETE BRIDGE APPROACH (RCBA) (CONTINUED)

17-5.09(02) Summary of Bridge Quantities

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

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

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

3. *Dense-graded subbase placed under the RCBA and extensions, per ton.*

[P:\Structural Services\Design Memos\Pending\2012\12RCBA-dm.doc]

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM 17-5.09 REINFORCED CONCRETE BRIDGE APPROACH (RCBA) (CONTINUED)

	Reinforcing Steel Details to be Included in the Plans	
	Square Structure	Skewed Structure
Standard RCBA Width [1]	No	No [3]
Nonstandard RCBA Width [2]	Yes	Yes

Notes:

1 *An RCBA width is considered standard if it is shown in the Bill of Materials table in the INDOT* Standard Drawings.

2 *An RCBA width is considered nonstandard if it is not shown in the Bill of Materials table in the INDOT* Standard Drawings.

3 *Including reinforcing steel details in the plans is optional for a standard-width skewed RCBA.*

4. *Reinforcing steel details, where required, will include the following:*

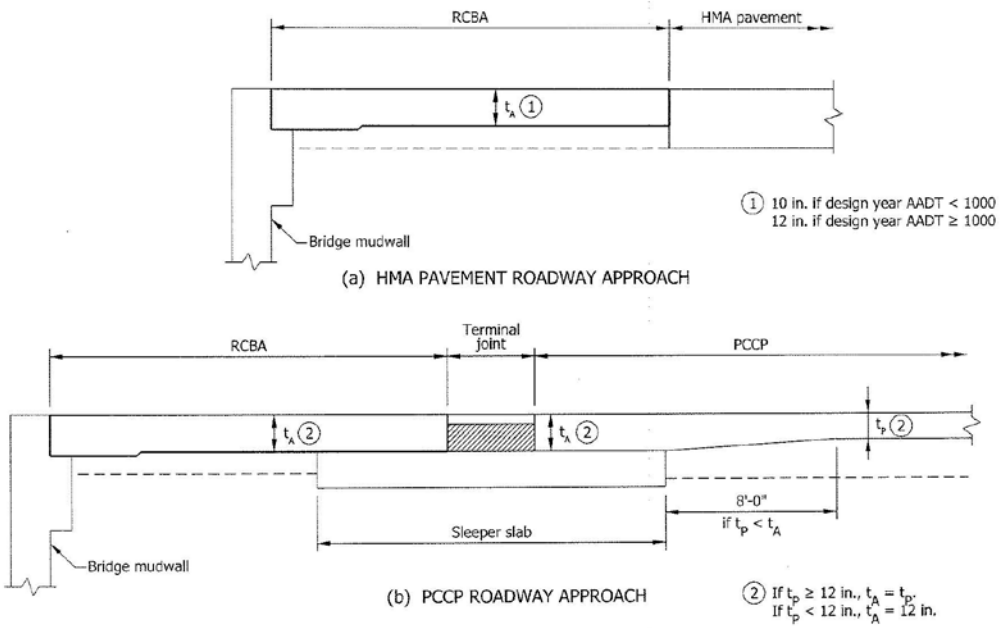
a. a bill of materials;
b. bending diagrams; and
c. cutting diagrams (where RCBA is skewed).

RCBA REINFORCING STEEL DETAILING REQUIREMENTS
Figure 17-5G

DELETE FIG, AS ALL RCBA'S WILL BE/ARE BEING DETAILED ON PLANS

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 02. IDM FIGURE 17-5G RCBA THICKNESS DETERMINATION (DRAFT)

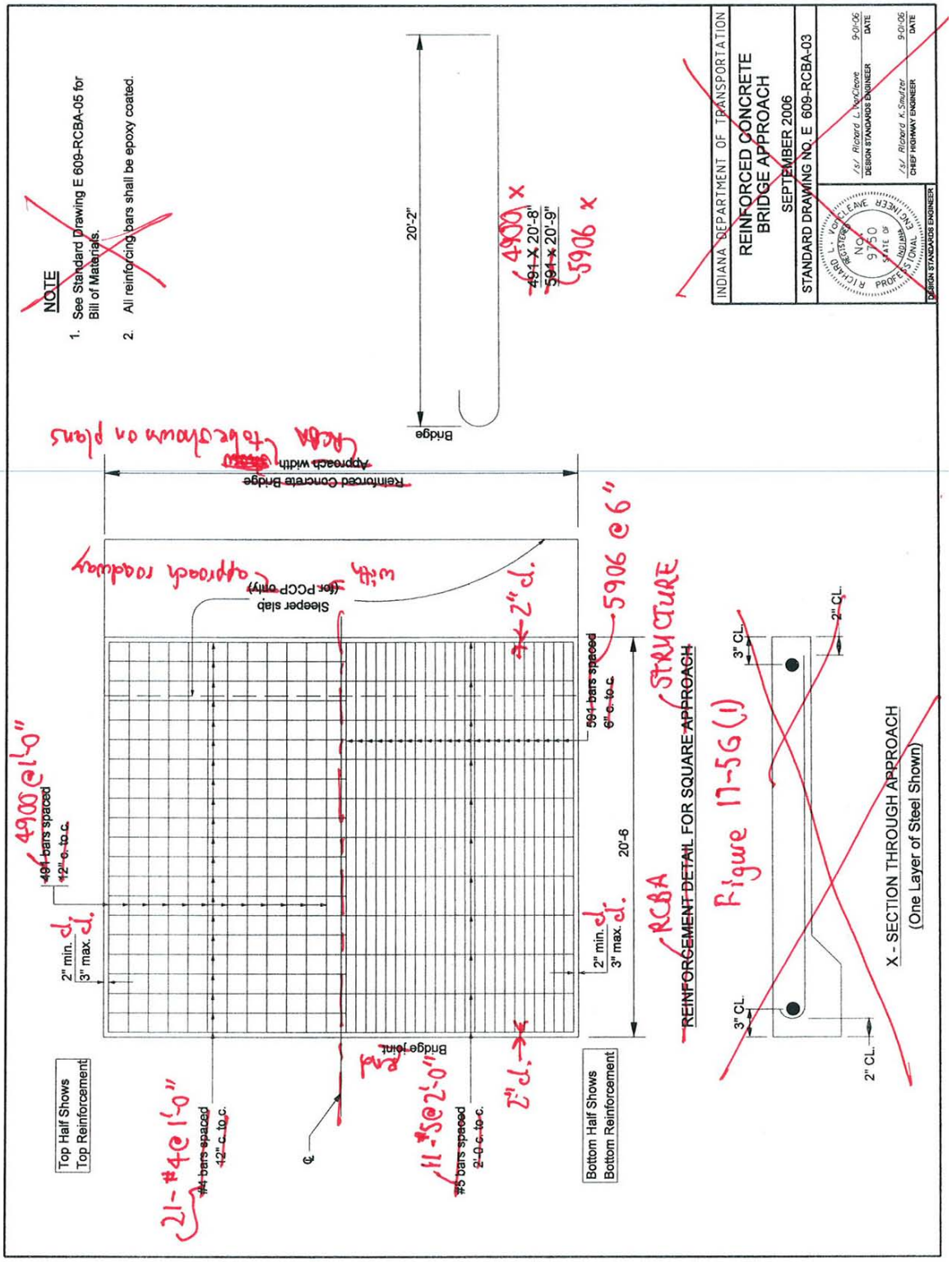


RCBA THICKNESS DETERMINATION

Figure 17-5G

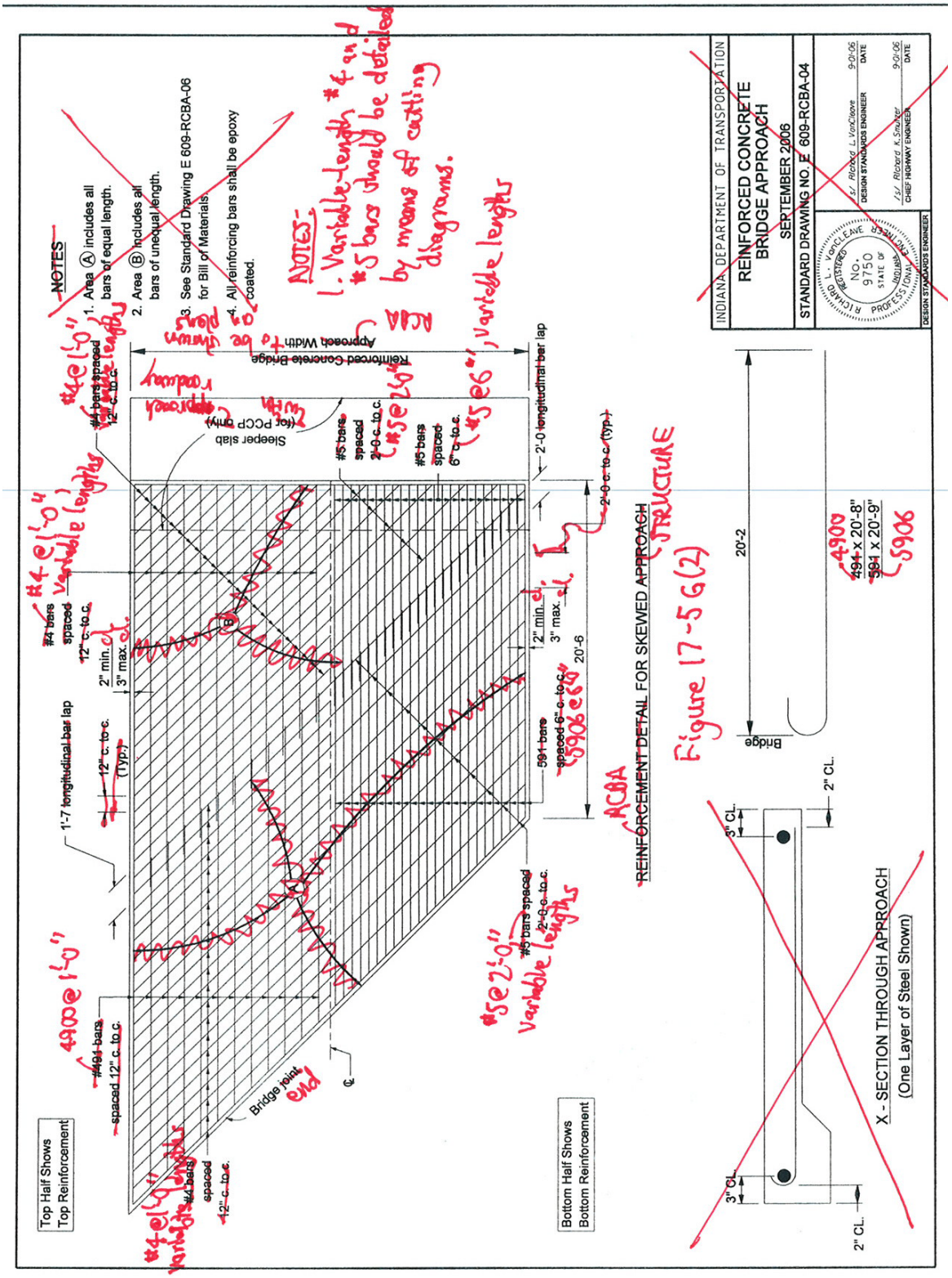
REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 03. IDM FIGURE 17-5G(1) RCBA FOR SQUARE STRUCTURE (MARKUP)



REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 04. IDM 17-5G(2) RCBA FOR SKEWED STRUCTURE (MARKUP)



COMMENTS AND ACTION

606.13 METHOD OF MEASUREMENT
609.14 BASIS OF PAYMENT
609-RCBA-01; -02; -03; -04; -05; -06 and -07

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: 609.13 pg 388; 609.14 pg 389. Recurring Special Provision affected: NONE Standard Sheets affected: 609-RCBA-01 THRU 07 Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Roadway departure crashes along horizontal curves continue to be a prominent safety issue.

PROPOSED SOLUTION: The use of fluorescent yellow sheeting for horizontal alignment warning signs is an accepted and proven means to enhance driver recognition of the hazard thereby significantly reducing crashes and fatalities - a number of states already specify its use for a remedy to this problem. To use this sheeting a revision to standard drawing 802-SNGS-05 is needed as is instruction to designers on when and how to specify.

APPLICABLE STANDARD SPECIFICATIONS: 919

APPLICABLE STANDARD DRAWINGS: 805-SNGS-05

APPLICABLE DESIGN MANUAL SECTION: 75-4

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

Submitted By: David Boruff

Title: Traffic Administration Manager

Organization: INDOT

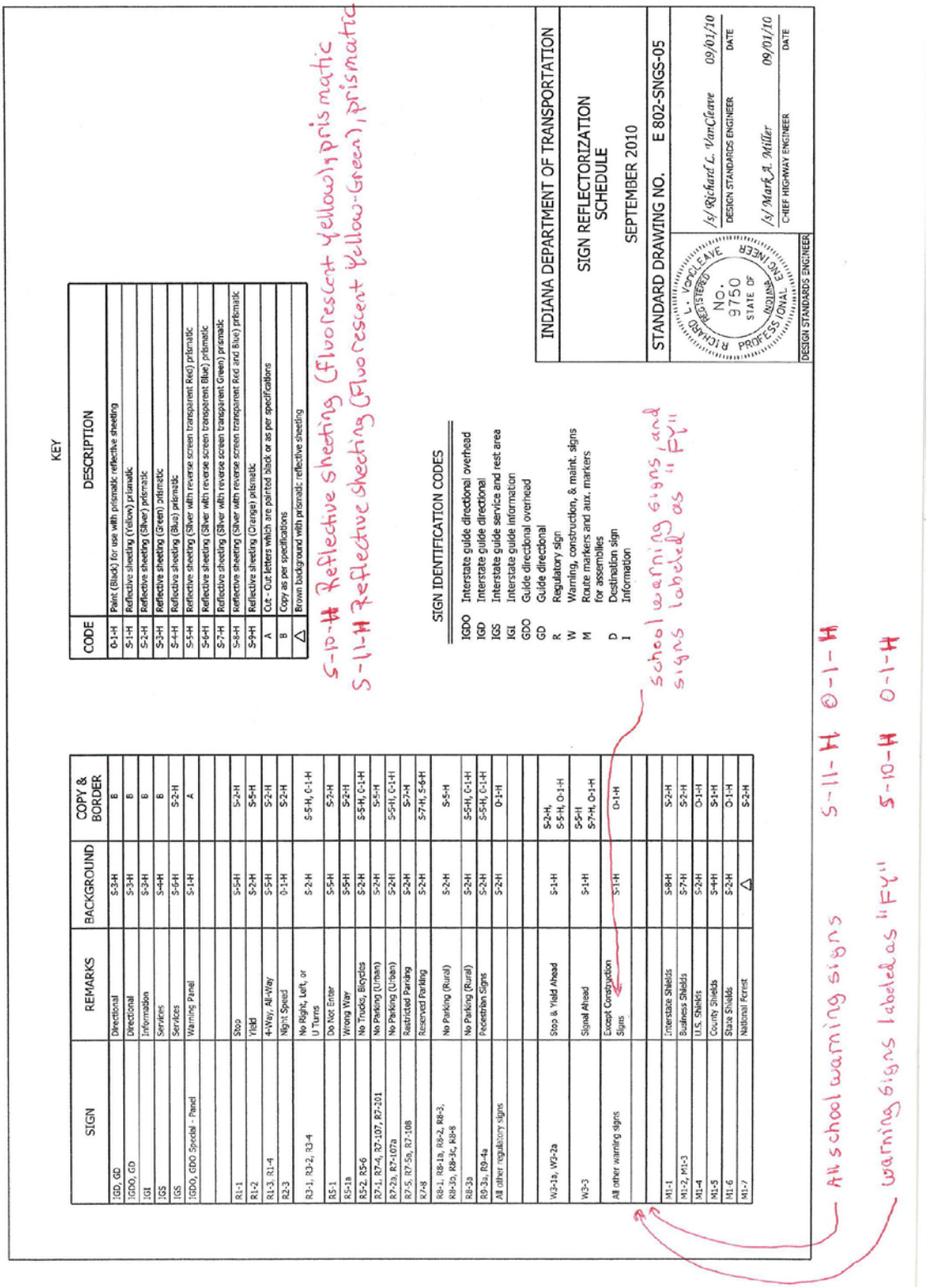
Phone Number: (317) 234-7975

Date: March 21,2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee consisting of the district Traffic Engineers, Maintenance Management, Traffic Design, and Traffic Safety Asset Management.

REVISION TO STANDARD DRAWINGS

EXISTING 802-SNGS-05 SIGN REFLECTORIZATION SCHEDULE (WITH MARKUPS)



SIGN	REMARKS	BACKGROUND	COPY & BORDER
IGD, GD	Directional	S-3-H	B
IGDO, GD	Directional	S-3-H	B
IGI	Information	S-3-H	B
IGS	Services	S-4-H	B
IGDO, GDO Special - Panel	Warning Panel	S-1-H	A
R1-1	Stop	S-5-H	S-2-H
R1-2	Yield	S-2-H	S-5-H
R1-3, R1-4	4-Way, All-Way	S-5-H	S-2-H
R2-3	Night Speed	0-1-H	S-2-H
R3-1, R3-2, R3-4	No Right, Left, or U Turns	S-2-H	S-5-H, 0-1-H
R5-1	Do Not Enter	S-5-H	S-2-H
R5-1a	Wrong Way	S-5-H	S-2-H
R5-2, R5-6	No Trucks, Bicycles	S-2-H	S-5-H, 0-1-H
R7-1, R7-4, R7-107, R7-201	No Parking (Urban)	S-2-H	S-5-H
R7-2a, R7-107a	No Parking (Urban)	S-2-H	S-5-H, 0-1-H
R7-5, R7-5a, R7-108	Restricted Parking	S-2-H	S-7-H
R7-8	Reserved Parking	S-2-H	S-7-H, S-6-H
R8-1, R8-1a, R8-2, R8-3, R8-3b, R8-3c, R8-5	No Parking (Rural)	S-2-H	S-5-H
R8-3a	No Parking (Rural)	S-2-H	S-5-H, 0-1-H
R9-3a, R9-4a	Pedestrian Signs	S-2-H	S-5-H, 0-1-H
All other regulatory signs		S-2-H	0-1-H
W3-1a, W3-2a	Stop & Yield Ahead	S-1-H	S-2-H, S-5-H, 0-1-H
W3-3	Signal Ahead	S-1-H	S-5-H S-7-H, 0-1-H
All other warning signs	Except Construction Signs	S-1-H	0-1-H
M1-1	Interstate Shields	S-8-H	S-2-H
M1-2, M1-3	Business Shields	S-7-H	S-2-H
M1-4	U.S. Shields	S-2-H	0-1-H
M1-5	County Shields	S-4-H	S-1-H
M1-6	State Shields	S-2-H	0-1-H
M1-7	National Forest	△	S-2-H

KEY

CODE	DESCRIPTION
0-1-H	Paint (Black) for use with prismatic reflective sheeting
S-1-H	Reflective sheeting (Yellow) prismatic
S-2-H	Reflective sheeting (Silver) prismatic
S-3-H	Reflective sheeting (Green) prismatic
S-4-H	Reflective sheeting (Blue) prismatic
S-5-H	Reflective sheeting (Silver with reverse screen transparent Red) prismatic
S-6-H	Reflective sheeting (Silver with reverse screen transparent Blue) prismatic
S-7-H	Reflective sheeting (Silver with reverse screen transparent Green) prismatic
S-8-H	Reflective sheeting (Silver with reverse screen transparent Red and Blue) prismatic
S-9-H	Reflective sheeting (Orange) prismatic
A	Cut - Cut letters which are painted black or as per specifications
B	Copy as per specifications
△	Brown background with prismatic reflective sheeting

S-10-H Reflective sheeting (Fluorescent Yellow) prismatic
S-11-H Reflective sheeting (Fluorescent Yellow-Green), prismatic

SIGN IDENTIFICATION CODES

IGDO	Interstate guide directional overhead
IGD	Interstate guide directional
IGS	Interstate guide service and rest area
IGI	Interstate guide information
GDO	Guide directional overhead
GD	Guide directional
R	Regulatory sign
W	Warning, construction, & maint. signs
M	Route markers and aux. markers for assemblies
D	Destination sign
I	Information

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN REFLECTORIZATION SCHEDULE

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-05

REGISTERED L. VANCLEAVE No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Richard L. VanCleave 09/01/10
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

school warning signs and signs labeled as "FY"

All school warning signs S-11-H 0-1-H

warning signs labeled as "FY" S-10-H 0-1-H

REVISION TO STANDARD DRAWINGS

BACKUP 01. IDM 75-4.07 FLUORESCENT YELLOW SHEETING USE FOR HORIZONTAL ALIGNMENT WARNING SIGNS (DRAFT)

75-4.07 Fluorescent Yellow Sheeting use for Horizontal Alignment Warning Signs

Fluorescent yellow sign sheeting should be specified for horizontal alignment warning signs if any of the criteria are satisfied as follows.

1. *flashing beacons for curve warning are in place or needed;*

2. *there is a crash history of vehicle departures from the curved alignment;*

3. *the advisory speed for the curve is at least 15 mph lower than the posted speed in that highway segment; or*

4. *the district traffic office has determined that the added conspicuity is needed.*

The affected sign series are as follows:

1. *horizontal alignment, W1-1 through W1-5, W1-10, W1-11, and W1-15;*

2. *large arrow,W1-6;*

3. *chevron, W1-8. Additional chevron signs may be needed to satisfy IMUTCD, Table 2C-6;*

4. *advisory speed plaque, W13-1P*

5. *advisory exit, W13-2; ramp speed, W13-3; and combination advisory exit and ramp speed, W13-6 and W13-7.*

Fluorescent yellow sheeting may be used for other types of warning signs only with approval by the Traffic Administration Office. Such request should be made similarly to a sign design exception- see Operations Memorandum 06-02. A statement regarding the specific need or expected benefit - e.g. motorists are not recognizing the existing warning sign which has type IV sheeting and crashes are resulting- should accompany the request.

If fluorescent yellow sign sheeting is required it should be shown on the plans and sign summary tables with the suffix - (FY) - added to the MUTCD sign code for the appropriate signs.

REVISION TO STANDARD DRAWINGS

BACKUP 02. OPERATIONS MEMORANDUM 06-02

INDIANA DEPARTMENT OF TRANSPORTATION
100 North Senate Avenue
Room N755
Indianapolis, Indiana 46204-2228
(317) 232-5533 *FAX: (317) 232-0238*
An Equal Opportunity Employer ● http://www.in.gov/dot

E. Daniels, Jr., Governor
D. Sharp, Commissioner

Highway Operations Division
IGCN 901

Writer's Direct I
317-233-4726

November 15, 2006

OPERATIONS
MEMORANDUM 06-02
SIGNS

TO: District Deputy Commissioners
District Directors Highway Management
District Traffic Engineers

FROM: Michael D. Bowman MB
Director, Highway Operation Division

SUBJECT: Sign Design Exception

A goal of INDOT is to develop uniformity of signage across the agency and state. The Indiana Manual on Uniform Traffic Control Devices (IMUTCD) is the primary document defining signs for Indiana. However, the IMUTCD allows for variations/modifications of presented signs and for special signs to address special circumstances as long as the modifications/variations are within the basic principles of the IMUTCD.

The IMUTCD is supported/extended by the Federal Standard Highway Signs Manual (SHS), various INDOT policies (ie. TODS & SGS policy), and an approved signs list. While these documents are based on the principles of the IMUTCD, they provide additional information/criteria on design and application of signs.

The collection of signs defined by these documents is considered "standard signs". The Districts should make every effort to use standard signs to address the needs of the motorist.

When ordered by the Districts, signs with designs in the IMUTCD, the SHS, the various policies, and the approved signs list will be fabricated as described in the documents and shipped to the requesting District according to the established order/deliver procedure. These are considered "standard signs" and have MCMS numbers assigned. Standard signs will represent the large majority of signs used.

Signs that are not "standard signs" are "non-standard signs". The use of non-standard signs should be minimized.

Special circumstances may dictate the need for special signs to adequately communicate information to the motorist. When all standard signs have been considered and found lacking in the ability to communicate the needed message, the District may request fabrication of a non-standard sign. The request for a sign design exception will be made to the Logistical Support Center and forwarded to the Office of Traffic Engineering (OTE), in the Division of Highway Operations. The request must include a detail of the requested sign, a description of the circumstances necessitating the non-standard sign, and a copy of the District's notes on consideration of standard signs and the decision that a non-standard sign would serve motorists better than a standard sign. The request will be reviewed by the OTE. The non-standard sign will not be fabricated, nor installed, until such has been approved by the OTE. When the OTE concurs with the use of a non-standard sign, it will be considered a "standard sign", possibly with limitations on usage, and will be available for use by all Districts by being placed on the approved signs listing and having a MCMS number assigned. Information on the proper application of the approved sign will be provided with the approval notification. The approval notification will be sent to the requesting party and all district traffic engineers.

REVISION TO STANDARD DRAWINGS

BACKUP 02. OPERATIONS MEMORANDUM 06-02

(CONTINUED)

Considerations on approving a non-standard sign will based on the primacy of documents and adherence to the design elements of the type of sign for the specific sign for which a sign design exception is being requested.

INDOT policy is the primary document when the INDOT policy is within the acceptable limits of the denoted Standards, Guidance or Options of the IMUTCD.
When INDOT does not have a specific policy, the IMUTCD, in association with the SHS, is the primary document.

COMMENTS AND ACTION

802-SNGS-05 SIGN REFLECTORIZATION SCHEDULE

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: 802-SNGS-05 SIGN REFLECTORIZATION SCHEDULE Design Manual Sections affected: SECTION 74 GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current standards for Worksite Speed Limit Assemblies (WSSLA) are no longer consistent with state code and recent changes to our policy.

PROPOSED SOLUTION: Revise the standard drawing and specification to describe the 2 types of application:

1. Intermittent use to protect workers
2. Continuous use to protect motorists- this is the new application

Also, there is no longer a maximum speed limit (it had been 45 mph) so references to such will be deleted and the "END WORK SITE SPEED LIMIT" will be added.

APPLICABLE STANDARD SPECIFICATIONS: 801.15

APPLICABLE STANDARD DRAWINGS: 801-TCDV-10; 801-TCDV-11; 801-TCSN-13

APPLICABLE DESIGN MANUAL SECTION: 83-2.03(01)

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

Submitted By: David Boruff

Title: Traffic Administration Manager

Organization: INDOT

Phone Number: (317) 234-7975

Date: March 27, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS
801.15(c) TEMPORARY WORKSITE SPEED LIMIT SIGN ASSEMBLY

The Standard Specifications are revised as follows:

SECTION 801, BEGIN LINE 719, DELETE AND INSERT AS FOLLOWS:

(c) Temporary Worksite Speed Limit Sign Assembly

This shall consist of furnishing and placing portable speed limit signs as shown on the plans or as directed in areas of work activity. *When used,* ~~T~~*t*he worksite speed limit flashing strobe lights shall be activated when the worksite speed limit is in effect. This shall be only where and while work is actually in progress and workers are present. Each strobe light shall be visible through a range of 120° when viewed facing the sign and shall have a minimum effective luminance of 2100 cd effective according to the manufacturer's literature, which shall be provided to the Engineer prior to use.

Wherever a permanent speed limit sign exists within the limits controlled by the worksite speed limit sign assemblies, additional worksite speed limit sign assemblies shall be placed next to the permanent signs or the permanent signs shall be covered.

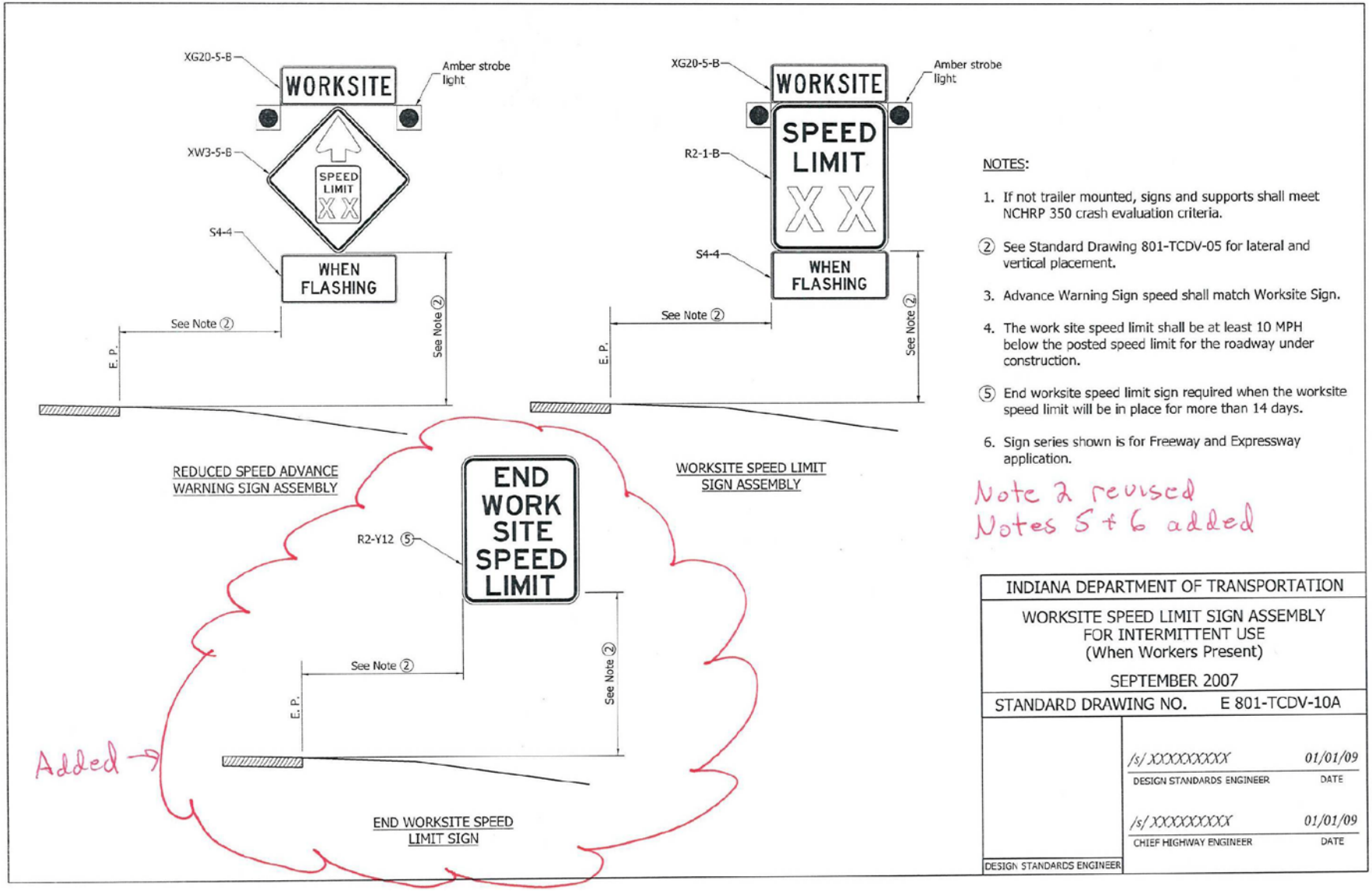
A worksite speed limit authorized for intermittent use shall only be activated when workers are present at the site. The worksite speed limit shall ~~not~~ *only* be used *in the area of work*. ~~for the entire length of a roadway under construction unless there is actual work activity for the entire length of such roadway. It shall not be activated at the beginning of the day, for the entire day, if actual work is not being done all day in the work area~~. *A worksite speed limit authorized for continuous use shall not include the flashing strobe lights nor the S4-4 "When Flashing" plaque.*

The worksite speed zone signage shall be placed and maintained by the Contractor. The worksite speed limit will be ~~45 mph, or~~ *as shown on the plans or as directed by the Engineer and at least* 10 mph below the posted speed limit for the roadway under construction~~, whichever is lower~~.

A worksite reduced speed advance warning sign assembly shall be placed in advance of the first worksite speed limit sign assembly when the reduction in speed limit is greater than ~~15~~ *10* mph.

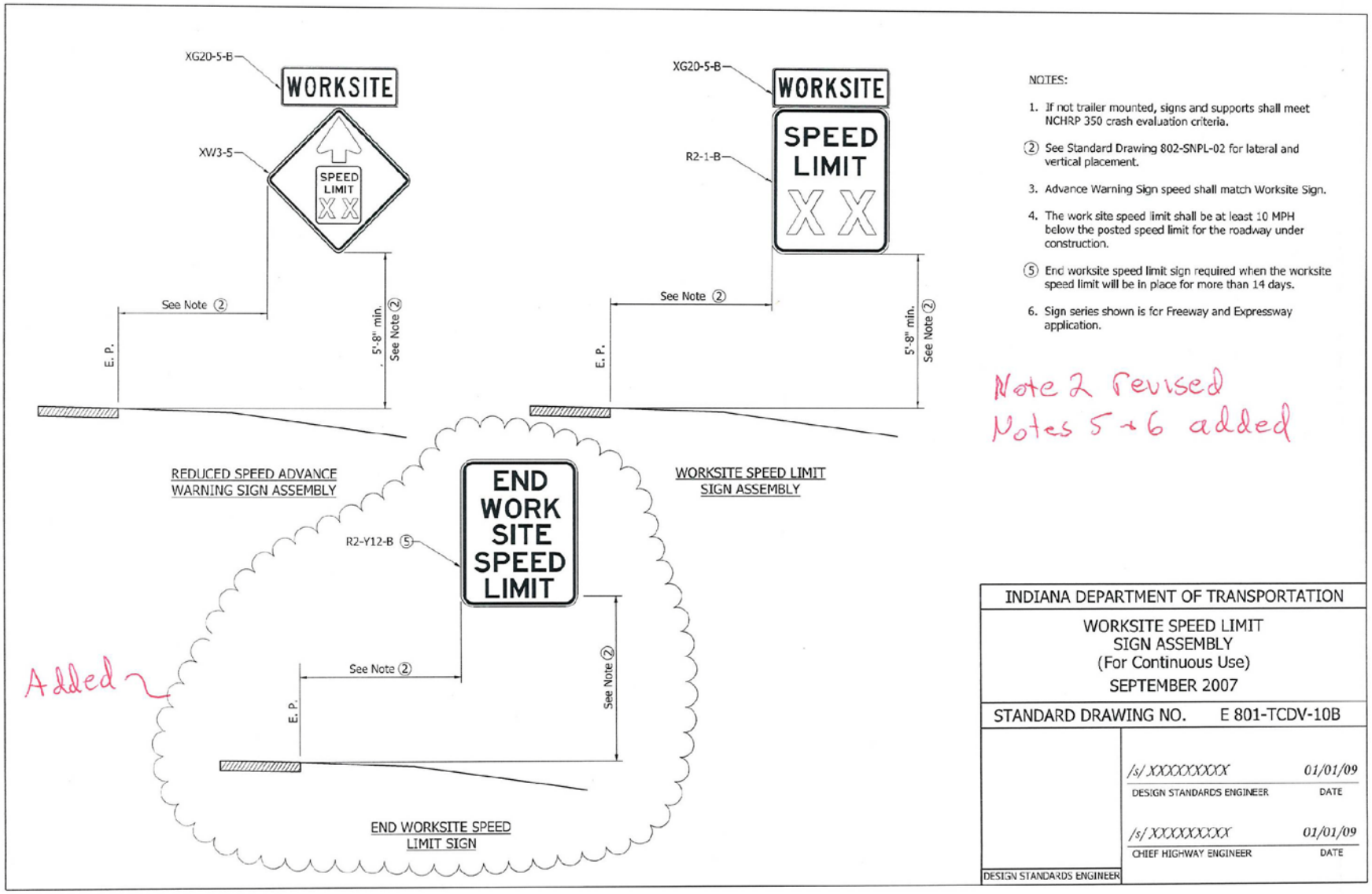
REVISION TO STANDARD DRAWINGS

801-TCDV-10A WORKSITE SPEED LIMIT SIGN ASSEMBLY FOR INTERMITTENT USE (DRAFT WITH MARKUPS)



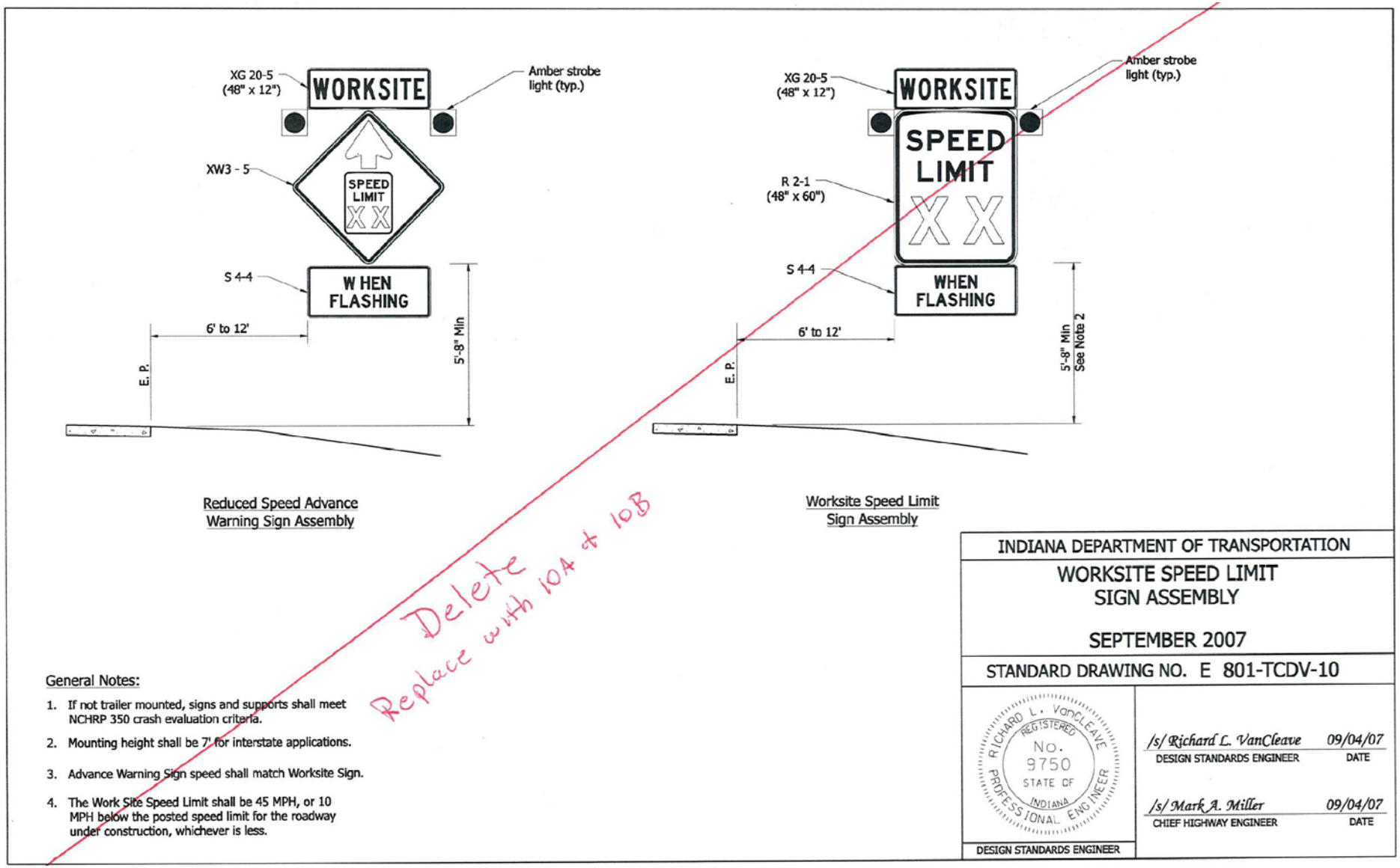
REVISION TO STANDARD DRAWINGS

801-TCDV-10B WORKSITE SPEED LIMIT SIGN ASSEMBLY (DRAFT WITH MARKUPS)



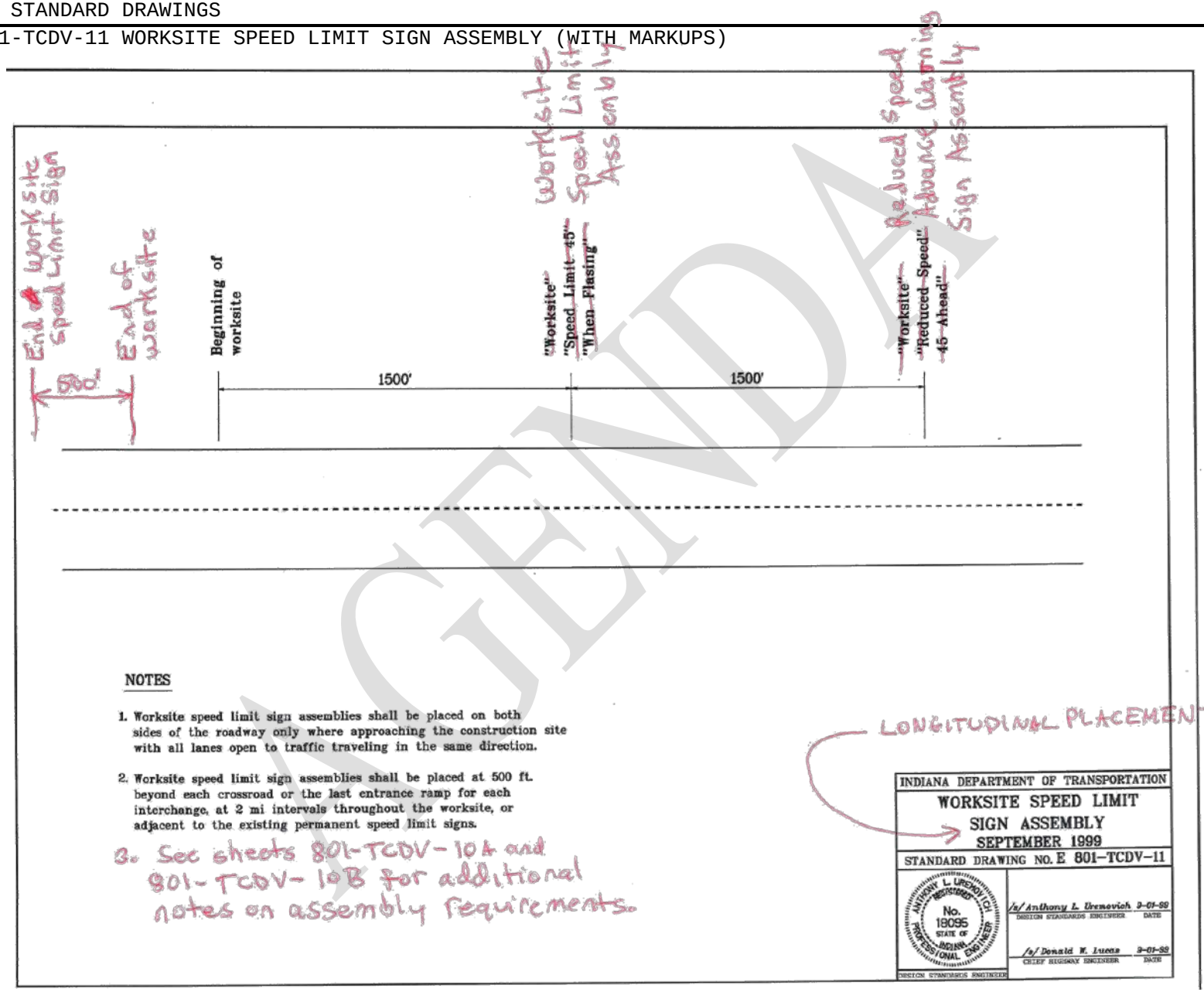
REVISION TO STANDARD DRAWINGS

EXISTING 801-TCDV-10 WORKSITE SPEED LIMIT SIGN ASSEMBLY (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 801-TCDV-11 WORKSITE SPEED LIMIT SIGN ASSEMBLY (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 801-TCSN-13 SIGN DESIGN DETAILS (WITH MARKUPS)

SIGN NUMBER	SIGN MESSAGE	POST DESIGN 4 x 4 WOOD	POST DESIGN STEEL	SIGN SIZE	SIGN COLOR BACKGROUND	SIGN COLOR COPY	BORDER WIDTH	MARGIN WIDTH	LETTER HEIGHT SERIES-LINE 1	LETTER HEIGHT SERIES-LINE 2	LETTER HEIGHT SERIES-LINE 3	LETTER HEIGHT SERIES-LINE 4	ARROW SIZE HEAD	ARROW SIZE SHAFT	CORNER RADIUS	NUMBER OF POSTS ONE	NUMBER OF POSTS TWO
XW101-1	"Mowing Crews Ahead"	*	A	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C	6 - Series C				2 1/4		X
XW101-1-A	"Mowing Crews Ahead"	*	B	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C	8 - Series C				3		X
XW102-1	"Mowing Crews Next ____ Miles"	*	A	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C	4 - Series C	4 - Series C			2 1/4		X
XW102-1-A	"Mowing Crews Next ____ Miles"	*	B	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C	6 - Series C	6 - Series C			3		X
XW103-1	"Watch For Stopped Traffic"	*	B	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C	7 - Series C				3		X
XW104-1	"Overhead Sign Installation"	*	B	60 x 24	Orange	Black	1/2	3/8	6 - Series C	6 - Series C					1 1/2		X
XW105-1-A	"Right Lane Exit Open"	*	B	48 x 48	Orange	Black	1 1/4	3/4	6 - Series C	6 - Series C					3		X
XW106-1-A	"Exit Closed"	*	B	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C					3		X
XW106-2-A	"Exit Open"	*	B	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C					3		X
XW108-1	"Utility Work Ahead"	*	A	36 x 36	Orange	Black	3/4	1/2	6 - Series D	6 - Series D	6 - Series D				2 1/4		X
XW108-1-A	"Utility Work Ahead"	*	B	48 x 48	Orange	Black	1 1/4	3/4	6 - Series C	6 - Series C	6 - Series C				3		X
XW109-1	"Exit" (above black arrow)	*	B	48 x 48	Orange	Black	1 1/4	3/4	12 - Series D						3		X
R2-1	"Speed limit: _____"	*	A	24 x 30	White	Black	1/2	3/8	4 - Series E	4 - Series E	10 - Series E				1/2	X	
R2-1-B	"Speed limit: _____"	*	B	48 x 60	White	Black	1 1/4	3/4	8 - Series E	8 - Series E	16 - Series E				3		X
R3-2-A (R or L)	(No ____ turn symbol)	*	A	30 x 30	White	Black	3/4	3/8							2	X	
R3-2-C (R or L)	(No ____ turn symbol)	*	B	48 x 48	White	Black	1 1/4	3/4							3		X
R4-1	"Do Not Pass"	*	A	24 x 30	White	Black	1/2	3/8	6 - Series D	6 - Series D	5 - Series D				1 7/8	X	
R4-1-B	"Do Not Pass"	*	B	48 x 60	White	Black	1 1/4	3/4	10 - Series D	10 - Series D	10 - Series D				3		X
R5-1-A	"Do Not Enter" (inside symbol)	*	A	36 x 36	Red	White	Radius 17 1/2		5 - Series D	6 x 30 Bar	5 - Series D				2 1/4		X
R5-1-B	"Do Not Enter" (inside symbol)	*	B	48 x 48	Red	White	Radius 23 1/2		6 - Series D	8 x 40 Bar	6 - Series D				3		X
R5-1 (R or L)	"One Way" (inside white arrow)	*	A	36 x 36	Black & White	Black	----	3/8	4 - Series D				7 1/2 x 8 1/2	22 1/4 x 5 1/4	1 1/2		X
R5-2-A (R or L)	"One Way" (above black arrow)	*	A	24 x 30	White	Black	1/2	3/8	6 - Series D	6 - Series D			5 1/4 x 6	8 x 2 1/4	1 1/2	X	
R11-2	"Road Closed"	*	B	48 x 30	White	Black	3/4	3/8	8 - Series D	8 - Series D					1 7/8		X
R11-3	"Road Closed Miles Ahead" "Local Traffic Only"	*	B	60 x 30	White	Black	3/4	3/8	6 - Series C	5 - Series C	4 - Series C				1 7/8		X
R11-4	"Road Closed To Thru Traffic"	*	B	60 x 30	White	Black	3/4	3/8	6 - Series C	5 - Series C	6 - Series C				1 7/8		X
R12-1	"Weight Limit ____ Tons"	*	A	24 x 30	White	Black	1/2	3/8	4 - Series D	4 - Series D	5 - Series E	5 - Series D			1 1/2	X	
R12-1-A	"Weight Limit ____ Tons"	*	B	36 x 48	White	Black	3/4	1/2	6 - Series D	6 - Series D	8 - Series E	10 - Series D			2 1/4		X
S 4-4	"When Flashing" plate	----	----	48 x 20	White	Black	1/2	3/8	5 - Series D	5 - Series D					1 1/2	----	----

Added

1 1/2

* Wood post permitted.

GENERAL NOTES

1. See Standard Drawing E 801-TCSN-11 for additional general notes.
2. All dimensions are in inches.

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DESIGN DETAILS

SEPTEMBER 2011

STANDARD DRAWING NO. E 801-TCSN-13

RICHARD L. VanCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

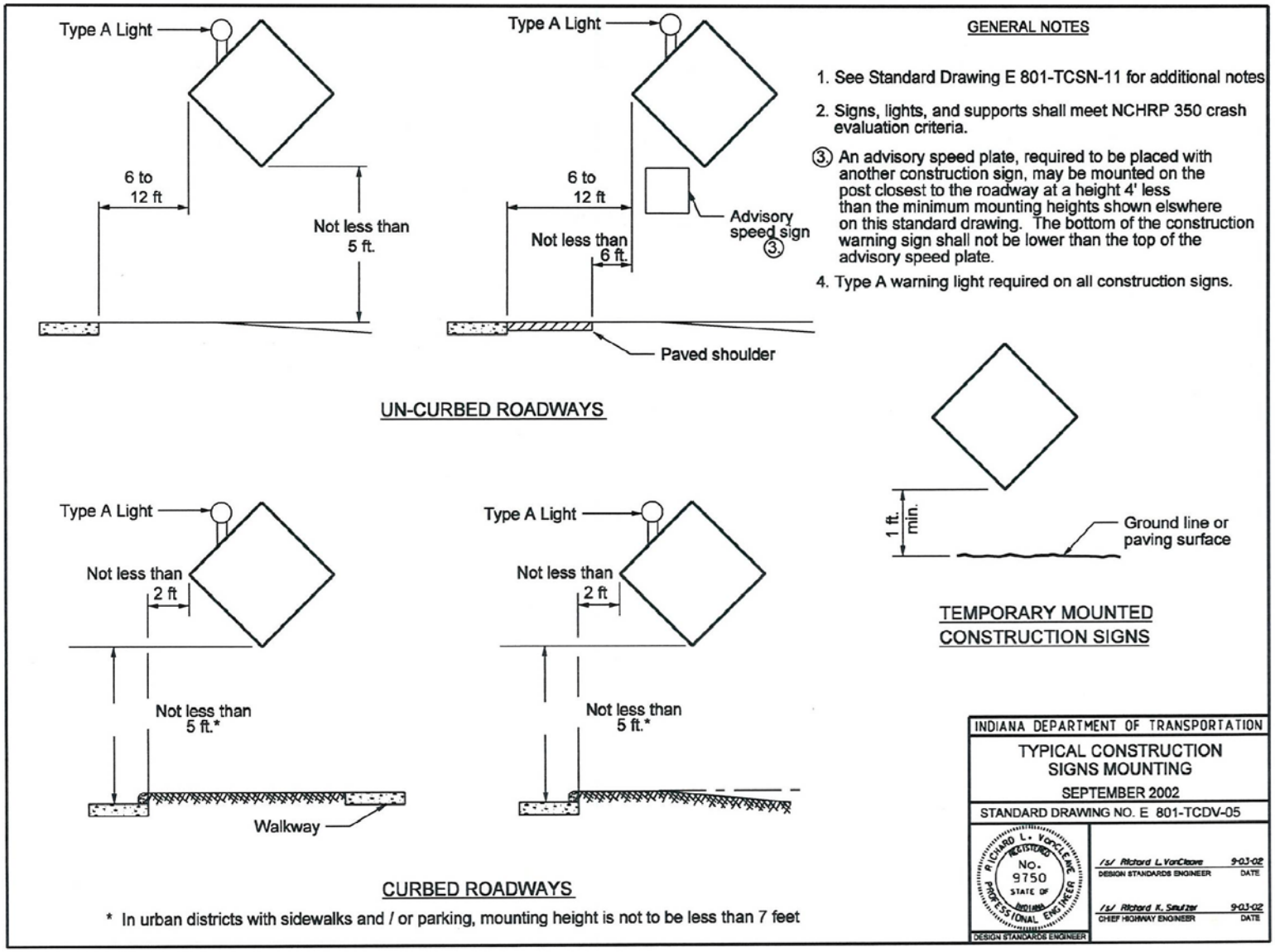
DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/11
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

BACKUP 01. EXISTING 801-TCDV-05 TYPICAL CONSTRUCTION SIGNS MOUNTING (FOR REFERENCE ONLY)



83-2.03 Regulatory Signing

83-2.03(01) Work-Zone and Work-Site Speed Limit Signing

Different speed limits may apply based on whether the speed limit is within the work zone or if it is within a work site. The work-zone speed limit applies throughout the project *as does a work-site speed limit authorized for continuous use to protect motorists*. *A work-site speed limit authorized for intermittent use to protect workers* applies to a specific location within the work zone where work is actually occurring. The following provides guidance in the selection and implementation of a work-zone or work-site speed limit.

1. Work-Zone Speed Limit. The work-zone speed limit will be determined based on the construction-zone design speed, traffic volume, work type, geometrics, project length, etc. The work-zone speed limit should not exceed the construction-zone design speed through the construction area. Section 82-3.01 provides guidance on the selection of a construction-zone design speed. If the work-zone speed limit is different than the existing posted speed limit prior to the start of construction, an Official Action as discussed in Section 83-1.03 will be required.

2. Work-Site Speed Limit. Indiana Statutes permit INDOT to establish a work-site speed limit without an Official Action. They also stipulate that the work-site speed limit will ~~either~~ be ~~45 mph, or~~ *at least* 10 mph below the original posted speed limit, ~~whichever is lower~~. ~~The~~ *An intermittent* work-site speed limit will only be applicable where and while work is actually in progress and workers are present. *When in place for more than 14 days a R2-Y12 "End Work Site Speed Limit" sign should be specified at the appropriate location. For longer work zones or where the next permanent speed limit sign is more than 1500 ft, from the R2-Y12 sign, additional signing to establish the normal speed limit should be used as follows:*

a. For rural interstate applications R2-1 and R2-Y2 signs for the normal speed limits should be placed approximately 500 feet downstream from the R2-Y12.

b. For all other applications an R2-1 sign for the normal speed limit should be placed adjacent to the left side of the R2-Y12.

3. Sign Size and Assembly. A work-zone or work-site speed-limit-sign assembly should be placed according to the *MUTCD* and should be of a size specified for the facility. Each work-site assembly should include a "Worksite" plate mounted above the regulatory sign.

REVISION TO SPECIFICATIONS AND STANDARD DRAWINGS

BACKUP 01. IDM 83-2.03 REGULATORY SIGNING (WITH PROPOSED CHANGES)

4. Flashing Beacon. Each work-site speed-limit-sign assembly *for intermittent* use must ~~should~~ incorporate strobe-type flashing beacons with one mounted at each upper corner of the regulatory sign. *In addition for intermittent use a* ~~A~~ "When Flashing" plate ~~should~~ *must* be placed below the sign. The beacons should be activated only while work is in progress and workers are present. The device provides for both worker and public safety without imposing unnecessary travel delays during non-working periods. *Flashing beacons and the "When Flashing" plate will not be incorporated with continuous use work-site speed limits*.

5. Selection. Figure 83-2B provides suggested work-zone and work-site speed limits for a freeway based on the type of facility and the proposed construction application.

6. Location and Spacing. In determining the location and spacing of signs, the following will apply.

a. Work-Zone Sign. The designer should coordinate with the district traffic engineer to determine the appropriate beginning and ending locations for the work-zone speed limit. A work-zone speed limit signs should be placed prior to the construction zone and after each interchange entrance ramp within the construction zone. The reduced speed zone should begin prior to an expected queue backup due to a lane closure, lane restriction, etc.

b. Work-Site Sign. The INDOT *Standard Specifications* provide the guidelines for determining the appropriate location for a work-site speed-limit-sign assembly.

7. ~~Rural Area~~ *Speed Limit Reductions Greater than 10 mph*. The regulatory sign, R2-15b, "Reduced Speed XX Ahead" should not be specified. Instead, reduced-speed-limit warning sign W3-5 or W3-5a should be specified. The details are shown on the INDOT Standard Drawings. Only one of the sign designations should be specified for the entire project.

8. Divided Facility. An assembly should be placed on each side of each roadway.

COMMENTS AND ACTION

801.15(c) TEMPORARY WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCDV-10A WORKSITE SPEED LIMIT SIGN ASSEMBLY FOR INTERMITTENT USE
801-TCDV-10B WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCDV-10 WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCDV-11 WORKSITE SPEED LIMIT SIGN ASSEMBLY
801-TCSN-13 SIGN DESIGN DETAILS

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: SECTION 801.15(c) pg 709, 710 Recurring Special Provision affected: NONE Standard Sheets affected: 801-TCDV-10 801-TCDV-11 801-TCSN-13 Design Manual Sections affected: SECTION 83-2.03 GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Requirements for ITS Virtual Weigh-In-Motion station controller cabinet foundations are well established and are consistent from one location to another.

PROPOSED SOLUTION: Standardize the drawing for VWIM Cabinet Foundations.

APPLICABLE STANDARD SPECIFICATIONS: 809

APPLICABLE STANDARD DRAWINGS:

APPLICABLE DESIGN MANUAL SECTION:

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

Submitted By: David Boruff

Title: Traffic Administration Manager

Organization: INDOT

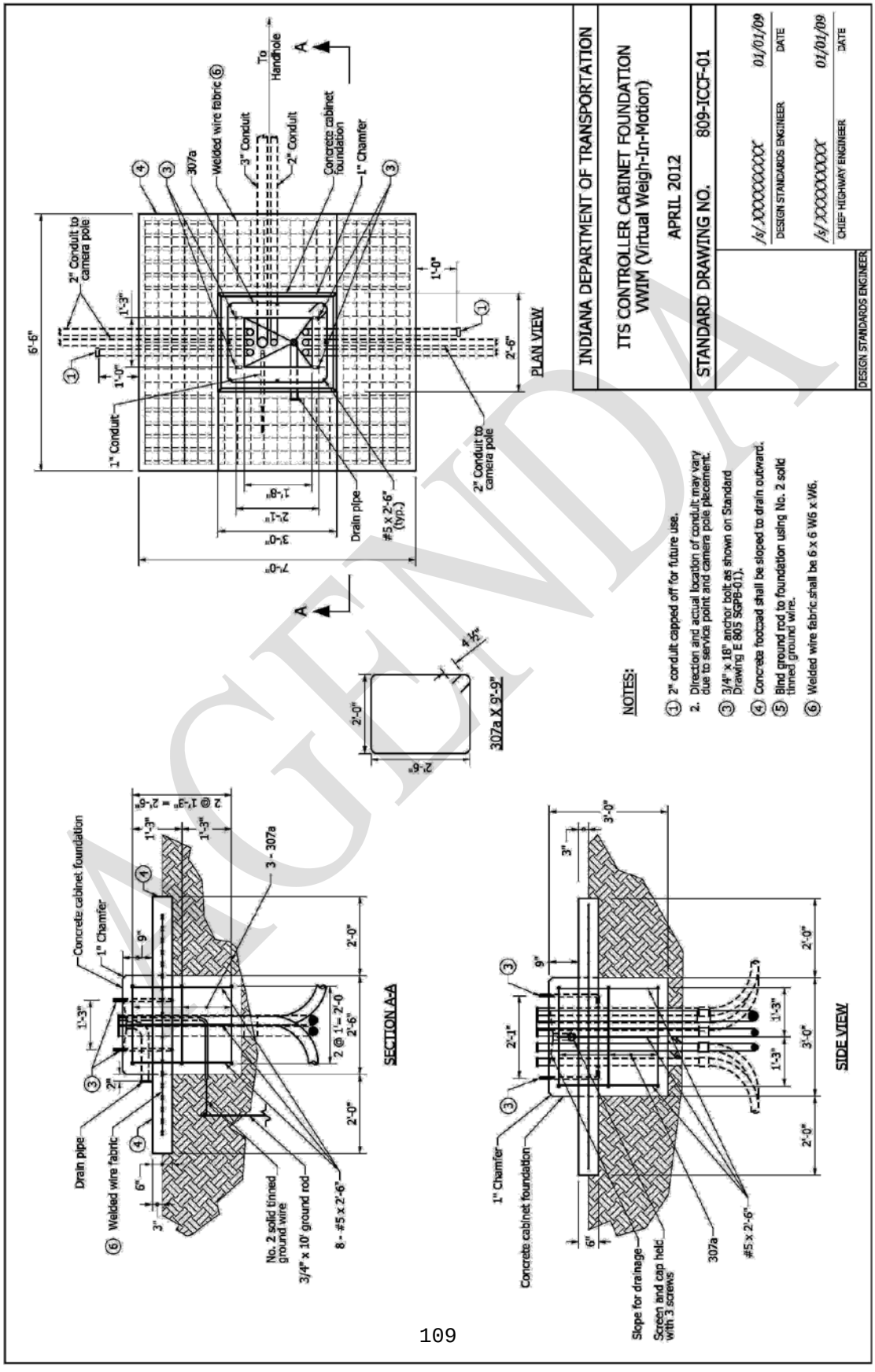
Phone Number: (317) 234-7975

Date: March 15, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ITS Technology Deployment Division and review by Standards section.

REVISION TO STANDARD DRAWINGS

PROPOSED NEW 809-ICCF-01 ITS CONTROLLER CABINET FOUNDATION VWIM (DRAFT)



COMMENTS AND ACTION

809-ICCF-01 ITS CONTROLLER CABINET FOUNDATION VWIM

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: PROPOSED NEW Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

Mr. Pankow
Date: 04/19/12

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT is required to comply with the requirements of 327 IAC Rule 5. Those requirements are much more extensive than the requirements spelled out in the current 205 section.

PROPOSED SOLUTION: The proposed RSP has more current practices for erosion and sediment control methods. This will replace the entire 205 section. Also, proposed is to remove language in RSP 108-C-192 that will now be in the 205 section.

APPLICABLE STANDARD SPECIFICATIONS: Sections 109, 203, 205, 621, 914

APPLICABLE STANDARD DRAWINGS: E 205-TECP-02, E 205-TECD-04, E 205 TECD-02, E 205-TECD-01 and 5 proposed new Standard Drawings

APPLICABLE DESIGN MANUAL SECTION: Extensive revisions have been submitted to the Design Manual committee

APPLICABLE SECTION OF GIFE: Section 3

APPLICABLE RECURRING SPECIAL PROVISIONS: 108-C-192

PAY ITEMS AFFECTED: See proposed 205 section

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT

Phone Number: 232-5502

Date: March 29, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Yes

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

PROPOSED NEW 205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL (DRAFT)

205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL

(Adopted XX-XX-12)

The Standard Specifications are revised as follows:

SECTION 101, AFTER LINE 104, INSERT AS FOLLOWS:

SWPPP Storm Water Pollution Plan

SECTION 109, AFTER LINE 820, INSERT AS FOLLOWS:

(g) Erosion and Sediment Control, E&SC

Quality adjustments will be calculated in accordance with 205.08.

SECTION 203, BEGIN LINE 194, DELETE AND INSERT AS FOLLOWS:

The Engineer will direct the Contractor to stabilize an area if the disturbed ground has been or will be left bare and unworked for 15 consecutive calendar days. Once directed, the Contractor shall stabilize these areas within 10 calendar days. These methods shall be installed in accordance with ~~621~~*205* or as otherwise directed.

SECTION 203, BEGIN LINE 268, DELETE AND INSERT AS FOLLOWS:

The soil slopes shall be roughened to create a series of ridges and depressions parallel to the ~~roadway~~ *contour* making grooves at least 1 in. ~~(25 mm)~~ deep and not more than 15 in. ~~(381 mm)~~ apart. When directed, slopes shall be stabilized using temporary seeding in accordance to ~~621~~*205*.

SECTION 205, DELETE LINES 1 THROUGH 212.

SECTION 205, BEGIN LINE 1 INSERT AS FOLLOWS:

SECTION 205 – TEMPORARY EROSION AND SEDIMENT CONTROL

205.01 Description

This work shall consist of furnishing, installing, maintaining, and removing temporary erosion and sediment control measures in accordance with 105.03.

MATERIALS

205.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate, Class F or Higher 904
Geotextile 918
Metal End Sections.....908.06
Pipe Drains .....715.02(d)
Revetment Riprap 904
Stakes.....914.09(b)

Fertilizer.....*914.03*
Filter Sock.....*914.09(h)*
Grass Seed, Temporary.....*914.02*
Mulch.....*914.05(a)*
Plastic Net.....*914.09(g)*
Top Soil.....*914.01*
Water.....*914.09(a)*
Wire Staples.....*914.09(f)*
Manufactured Surface Protection Products.....*205.04(c)*

Straw bales shall not weigh less than 35 lb. Bales shall be bound with wire or nylon twine.

CONSTRUCTION REQUIREMENTS

205.03 General Requirements

The installation of temporary erosion and sediment control measures shall include those necessary or required by permits at off-site locations such as borrow and disposal areas, field office sites, batch plants, locations where the Contractor's vehicles enter and leave public roads, and other locations where erosion or sediment control becomes an issue during the contract. The Contractor's designated individual in accordance with 108.04 shall be responsible for the installation, inspection, and maintenance of these measures. Temporary erosion control measures shall be placed as soon as practical. Perimeter protection and sediment traps shall be installed prior to beginning earth disturbing activities. Pipe end sections and anchors shall be installed when the structure is installed. If the pipe end sections or anchors cannot be placed at the same time, temporary riprap splashpads shall be placed at the outlets of the pipes until end sections or anchors can be installed.

Adjustments of the erosion and sediment control measures shall be made where appropriate to meet field conditions. These measures shall be constructed as soon as practical and shall be maintained as necessary.

The Contractor shall provide a stable construction entrance at the points where construction traffic will enter onto an existing road. Additional stone may be required, as directed by the Engineer. Where there is insufficient room for a stable construction entrance, other measures shall be taken to prevent the tracking of sediment onto the pavement. Temporary entrances utilized by the Contractor for borrow and waste areas will not be paid for directly. These temporary entrances shall be the responsibility of the Contractor to completely install, maintain, and remove.

Non-vegetated areas shall be temporary stabilized when the area remains inactive for more than 7 days or as directed by the Engineer. The area will be considered inactive when no meaningful work toward accomplishing a pay item has been performed at a site of disturbed soil.

The Contractor shall provide concrete washout facilities of adequate capacity in accordance with project requirements. The concrete washout shall be located as far from protected waters as practical, and shall be able to contain all liquid and solid material from concrete truck or mixer washing operations without contacting or contaminating the ground.

205.04 Temporary Surface Stabilization

(a) Seed

Temporary seeding shall be placed on disturbed areas that are expected to be inactive for more than 7 days, or as directed. Seed may be drilled in or mixed with water. The mixture shall be sprayed over the area to be seeded. An approved mechanical method which shall place the seed in direct contact with the soil may be used. In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated cyclone seeder or other approved equipment may be used. Seed shall not be covered more than 1/2 in. Seed may be distributed by a drill seeder, cyclone seeder, hand or other approved equipment which allows for even distribution of the seed. If as a result of a rain event, the prepared seed bed becomes crusted or eroded, or ruts, or depressions exist, the soil shall be reworked until it is smooth. Reworked areas shall be re-seeded.

1. Seed Mixture T

Seed mixture T shall be used for surface stabilization and temporary ground cover. Temporary cover mixtures shall be placed as directed and be subject to seasonal limitations as defined herein. This mixture is not intended to be used as a permanent seed mixture. This mixture shall not be used to satisfy the requirements of the warranty bond.

The mix shall be mulched when slopes exceed 3:1. From June 16 to August 31, mulching alone shall be used to stabilize the soil.

a. Spring Mix

Spring mix shall be used from January 1through June 15. This mixture shall be applied at the rate of 150 lb/ac. The mix shall consist of oats.

b. Fall Mix

Fall mix shall be used from September 1 through December 31. This mixture shall be applied at the rate of 150 lb/ac. This mix shall consist of winter wheat.

When directed, fertilizer shall be spread uniformly over the area to be seeded. Fertilizer for temporary seeding shall be applied at 1/2 the rate in 621.05(a) unless otherwise directed. Fertilizer shall be applied during the active growing season March through November.

2. Blank

(b) Mulch

Mulch shall be applied uniformly in a continuous blanket at the rate of 2.5 t/ac. If seeded, mulch shall be placed within 24 h after seeding. The percent of moisture in the mulch shall be determined in accordance with 621.14(c).

Mulch shall be punched into the soil so that it is partially covered. The punching operation shall be performed longitudinally to the slope. The tools used for punching purposes shall be disks that are notched and have a minimum diameter of 16 in. The disks shall be flat or uncupped. Disks shall be placed a minimum of 8 in. apart. Shaft or axle sections of disks shall not exceed 8 ft in length.

The disk for punching shall be constructed so that weight may be added or hydraulic force may be used to push puncher into the ground. Care shall be exercised to obtain an even distribution of mulch incorporated into the soil.

On slopes 3:1 or steeper but less than 2:1, or when specified, temporary mulch stabilization shall also be used. Unless otherwise specified any of the following types may be used.

1. Type A

The mulch shall be held in place by means of commercially produced water borne mulch binder product. The product shall be manufactured and used in accordance with all applicable State and Federal regulations. Such product shall be applied in accordance with the manufacturer's written instructions. A copy of the written instructions shall be supplied to the Engineer prior to the seeding work. The product shall contain a coverage indicator to facilitate visual inspection for evenness of application. If the mulch fails to stay in place, the Contractor shall repair all damaged areas.

2. Type B

The mulch shall be held in place with binder twine fastened down with wooden pegs not less than 6 in. long spaced 4 ft apart. The twine shall be placed parallel to and also at 60° with the pavement edge in both directions. The distance between the intersections of the diagonal strands measured along the strands shall be 12 ft. The strand parallel to the pavement shall cross the diagonal strands at their intersections to form equilateral triangles 12 ft on a side.

3. Type C

The mulch shall be held in place with a polymeric plastic net. The plastic net shall be unrolled such that it lays out flat, evenly, and smoothly, without stretching the material. The plastic net shall be held in place by means of wire staples. The wire staples shall be driven at a 90° angle to the plane of the soil slope. Staples shall be spaced not more than 4 ft apart with rows alternately spaced. The plastic net shall be secured along the top and bottom of the soil slope with staples spaced not more than 1 ft on center. The ends and edges of the plastic net shall be overlapped approximately 4 in. and stapled.

Overlaps running parallel to the slope shall be stapled 1 ft on center and overlaps running perpendicular to the slope shall be stapled at least 3 ft on center. The plastic net shall be placed with the length running from top of slope to toe of slope, or the plastic net shall be placed with the length running horizontally or parallel to the contour.

On slopes 2:1 or steeper, or when specified, a manufactured surface protection product shall be used.

(c) Manufactured Surface Protection Products

Any of the following manufactured surface protection products may be used when covering areas that have not been seeded. Soil cover shall not be used to cover seeded areas. Prior to placing the manufactured surface protection product, the area to be covered shall be relatively free of all rocks or clods over 1 1/2 in. in diameter, and all sticks or other foreign material, which prevent the close contact of the blanket with the seed bed.

After the area has been properly shaped, fertilized, and seeded, the manufactured surface protection products shall be laid out flat, evenly, and smoothly, without stretching the material.

1. Excelsior Blankets

Excelsior blankets may be used as mulch for seeding where seeding is specified or where erosion control blanket is specified. Excelsior blankets shall be placed within 24 h after seeding operations have been completed. Excelsior blankets shall be installed per the manufacturer's recommendation.

2. Straw Blanket

Straw blankets may be used for mulch for seeding when mulched seeding is specified or where erosion control blanket is specified. Straw blankets shall be placed within 24 h after seeding. The straw blankets shall be unrolled over the designated area so that the plastic mesh is on top and the straw fibers are snugly and uniformly in contact with the soil surface. The rolls shall be butted snugly together and stapled in place. The staples shall be driven through the blanket at a 90° angle to the plane of the ground surface. Each staple shall anchor the plastic mesh. The staples shall be spaced per the manufacturer's recommendation.

For placement on slopes, the straw blankets shall be placed with the length running from the top of slope to the toe of slope and shall extend a minimum of 3 ft over the crown of the slope. The blankets shall be stapled per the manufacturer's recommendation.

For placement in ditch lines, the straw blankets shall be unrolled parallel to the centerline of the ditch. The blankets shall be placed so that there are no longitudinal seams within 24 in. of the bottom centerline of the ditch. In ditch lines the blankets shall

be stapled per the manufacturer's recommendation with a minimum of 6 staples across the upstream end of each roll.

3. Rolled Erosion Control Products

When directed, the Contractor shall install or with approval of the Engineer, the Contractor may use degradable rolled erosion control products, RECP, including netting, open weave textile, and erosion control blankets.

Unless soil infilling is required, apply seed first according to 621. If soil infilling is required, RECP shall be first installed and then seed applied and lightly brushed or raked 1/4 to 3/4 in. of topsoil into voids in the RECP filling the full product thickness. Staples that are at least 6 in. long shall be used to secure the RECP. Unroll the RECP parallel to the primary direction of flow and place it in direct contact with soil surface. RECP shall not bridge over surface inconsistencies. Overlap edges of adjacent RECP by 2 to 4 in. A sufficient number of staples shall be used to prevent seam separation.

4. Geotextile

When directed, disturbed soil shall be covered with geotextile. The covering shall be placed over the exposed soil in a shingle like fashion with a 2 ft minimum overlap covering all loose or disturbed soil. The geotextile, when new, shall meet the requirements of 918.02. The geotextile used for soil covering need not be new but shall be in good condition and not have any holes or any unrepaired rips or tears. All repairs shall be made in accordance with the manufacturer's recommendation.

205.05 Concentrated Flow Protection

(a) Check Dams

Check dams and modified check dams shall be constructed as shown on the plans. Geotextile for check dams shall be in accordance with 616 unless otherwise specified. Revetment riprap shall be in accordance with 616 unless otherwise specified. No. 5 and No. 8 filter stone shall be in accordance with 904.

(b) Check Dam, Traversable

Traversable check dams shall be composed of straw bales, 8 in. minimum fiber rolls, or 8 in. minimum diameter socks filled with straw, ground wood chips, shredded bark or other approved material for site specific conditions. Rolls and socks may be stacked in a triangle pattern as shown on the plans. Check dams shall be staked as shown on the plans or as directed by the manufacturer. Check dams shall be configured to eliminate gaps between sections. Straw bales shall be placed such that the bindings are parallel to and not in contact with the ground.

(c) Diversion Interceptors

Diversion interceptors shall be constructed in accordance with 203 with the exception that compaction requirements will not apply. The Contractor shall identify in the SWPPP update, the construction areas which shall utilize Type A and B diversions.

Revetment riprap stable outlet with geotextile shall be constructed in accordance with 616 unless otherwise specified. Perimeter diversion, Type C shall be installed prior to earth moving activities and shall be immediately stabilized. Types A and B must be stabilized if it is anticipated being left in place for more than 15 calendar days. Stabilization methods shall be according to plan or as directed by the Engineer.

(d) Sediment Traps

Revetment riprap and filter stone in accordance with 904 shall be used in construction of sediment traps, unless otherwise specified. Geotextiles shall be in accordance with 918.02.

(e) Sediment Basins

Embankment construction shall be in accordance with 203. Revetment riprap used for overflow protection shall be in accordance with 904, unless otherwise specified. Sediment basins shall be constructed as shown on the plans, or as directed.

(f) Slope Drains

Slope drain pipes shall be lengthened as required by the construction of the embankment.

(g) Vegetative Filter Strips

Designated vegetative filter strips shall not be disturbed. Any small rills that form shall be repaired. Fertilizer shall be applied as directed.

(h) Splashpads

Splashpads shall be constructed with revetment riprap with geotextile in accordance with 904 and 918.

(i) Inlet Protection

All deck and curb drains shall have sediment control measures when the structure or road is to be used for hauling operations or adjacent to disturbed areas. Copies of all current manufacturers' installation manuals shall be provided prior to installation.

Inlet protection shall be as shown on the plans.

(j) Retention Ponds

Excavation shall be in accordance with 203. The soil used in the liner shall be in accordance with AASHTO M 145, classification A-6 or A-7.

The sides and bottom of the retention pond shall be lined with a soil liner of 2 ft minimum thickness. The soil in the liner shall be compacted to 95% of the maximum dry density in accordance with 203.23. The Contractor may use an alternate lining system. Details of the proposed pond lining system shall be submitted to the Office of Geotechnical Services for approval. These details shall include all necessary information such as liner thickness, smooth surface versus textured surface, thickness and type of

proposed soil cover, joint construction, material used in the liner, and the manufacturer of the liner.

205.06 Perimeter Protection

(a) Silt Fence

The manufacturer's recommendations shall be followed with regard to shipping, handling, and storage. The silt fence material shall meet the requirements of 918.04. The geotextile will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, storage, or installation. Each roll shall be labeled or tagged to provide product identification.

Joints shall be made from the ends of each section of fence wrapped around a wood stake and joined together. Copies of all current manufacturer manuals shall be provided prior to installation.

(b) Filter Berm

A filter berm shall be installed as shown on the plans. The filter berm may be constructed of organic mulch, filter sock, or No. 5 and No. 8 filter stone in accordance with 904.

205.07 Maintenance

Temporary erosion and sediment control measures shall be inspected by the Contractor, at a minimum, once every 7 days and after 1/2 in. rain event. Inspections shall be documented and records maintained by the Contractor, to be submitted to the Engineer on the next business day following the inspection. Records shall include, at a minimum, the date, the inspector's name, the maintenance and corrections needed based on the inspection, and the status of previously identified deficiencies. The temporary protection measures shall be returned to good working conditions within 48 h after inspection or as directed. The Contractor shall rebuild or repair any damaged temporary erosion and sediment control measures.

(a) Silt Fence

If the fence fabric tears, starts to decompose, or in any way becomes ineffective, the affected portion shall be replaced. Deposited sediment shall be removed when it reaches 1/2 the height of the fence at its lowest point. When the contributing drainage area has been stabilized, the Contractor shall remove the fence and sediment deposits, grade the site to blend with the surrounding area, and stabilize the graded area.

(b) Sediment Basin

Sediment shall be removed when it has accumulated to the design volume. The filter stone around the riser pipe shall be replaced if the sediment pool does not drain within 72 h following the design storm water runoff event.

(c) Filter Berm

Accumulated sediment shall be removed when it reaches 1/4 of the height of the filter ridge. The filter ridge shall be inspected to ensure it is holding its shape and allowing adequate flow. Eroded and damaged areas shall be repaired.

(d) Inlet Protection

Accumulated sediment shall be removed when identified and after each storm event. Flushing with water will not be allowed. The sediment shall not re-enter the paved area or storm drains. Curb inlet inserts shall be cleaned per the manufacturer's recommendations.

(e) Sediment Traps

Following each storm event, the Contractor shall repair slope erosion and piping holes as required. Sediment shall be removed when it has accumulated to 1/2 the design volume. The Contractor shall replace the coarse aggregate filter stone if the sediment pool does not drain within 72 h following a storm water runoff event.

(f) Concrete Washout

The containment system shall be inspected for leaks, spills, and tears, and shall be repaired or replaced as necessary. The Contractor shall ensure each containment system maintains adequate capacity. Solidified waste concrete shall be disposed of in accordance 202.

(g) Check Dams

Sediment shall be removed once it reaches 1/2 the height of the check dam. Sediment shall be removed and disposed of in accordance with 201.03 and 203.08. The Contractor shall rebuild or repair any damaged check dam to maintain the design height, cross section, and erosion control function.

205.08 Quality Adjustments

If unsatisfactory maintenance is not remedied within 48 h after the inspection noting the deficiency or as directed, the Contractor may be assessed damages for failure to maintain the required temporary erosion and sediment control. For each day, or portion thereof, during which the following units of temporary erosion and sediment control are in an unsatisfactory condition, a quality adjustment, in accordance with 109, will be assessed as shown for each day, or portion thereof, per unsatisfactory unit.

In the event that conditions do not allow the Contractor access to the location of the erosion or sediment control features using normal and customary equipment and maintenance has been directed, the Contractor may propose a written alternate schedule, within 48 h, to bring the erosion and sediment control features back into compliance. Any damages will be assessed based on compliance with the approved schedule.

(a) Silt Fence: $100.00 per each contiguous 100 ft section or portion thereof
(b) Check Dam: $100.00 per check dam
(c) Sediment Basin: $100.00 per basin

(d) Sediment Trap: $100.00 per trap
(e) Inlet Protection Devices: $100.00 per unit
(f) Failure to inspect site per 327 IAC requirements: $100.00 per required inspection
(g) Failure to temporary stabilize non-vegetated areas: $100.00 per acre or portion thereof
(h) Failure to correct identified deficiencies not defined above: $100 per day per measure

Silt fence will be considered unsatisfactory when the fence material has an exposed cut or tear exceeding 1 ft in length, a seam has separated or the retained sediment exceeds 1/2 of the height of the fence.

Check dams, sediment basins and sediment traps will be considered unsatisfactory when they no longer perform their function or the retained sediment exceeds 1/2 of the effective height.

Inlet protection devices will be considered unsatisfactory when they no longer perform their function or the accumulated sediment exceeds 1/2 of the height of the device.

205.09 Removal

Temporary erosion and sediment control measures shall remain in place until directed to be removed. The Contractor shall remove and dispose of all excess silt accumulations, dress the area, and vegetate all bare areas in accordance with the contract requirements. Use or disposal of temporary erosion and sediment control measures shall be as directed.

205.10 Method of Measurement

Silt fence and check dams, traversable will be measured by the linear foot. Check dams, traversable will be measured once per dam parallel to the dam and at the widest point. Sediment basins will be measured by the units installed complete in place. Revetment riprap check dams, sediment traps, and splashpads will be measured by the ton. Temporary filter stone will be measured by the ton. Temporary mulch will be measured by the ton. Temporary mulch stabilization will be measured per the square yard. Temporary seeding will be measured by the pound. Temporary geotextile will be measured by the square yard, and will be made only once for the maximum square yardage in place at any one time, regardless of the number of times the material is moved. Removal of sediment will be measured by the cubic yard. Revetment riprap will be measured in accordance with 616.12. Slope drains will be measured in accordance with 715.13. Inlet protection will be measured per each unit installed. Filter berm will be measured by the linear foot complete in place. Filter sock will be measured by the linear foot, complete in place. Diversion interceptor type C will be measured by the linear foot. Concrete washouts will not be measured separately. No. 2 stone for stable construction entrances will be measured by the ton in accordance with 109.01(b).

Diversion interceptors type A and B, and the off-site locations designated in 205.03 will not be measured for payment.

Excavation for detention and retention ponds will be measured as common excavation in accordance with 203.27. Retention pond liners will not be measured for payment.

205.11 Basis of Payment

The accepted quantities of silt fence will be paid for at the contract unit price per linear foot, complete in place. Temporary mulch will be paid for by the ton. Temporary seeding will be paid for at the contract unit price per pound. Temporary geotextile will be paid for by the square yard. Sediment basins will be paid for at the contract unit price per each unit installed. Temporary check dams, revetment riprap; temporary filter stone; sediment traps; and splashpads will be paid for by the ton. Temporary check dams, traversable will be paid for by the linear foot. Revetment riprap will be paid for in accordance with 616.13. Slope drains will be paid for in accordance with 715.14. Removal of sediment will be paid for at the contract unit price per cubic yard. Inlet protection will be paid for at the contract unit price per each unit installed. Filter berm will be paid for at the contract unit price by the linear foot complete in place. Filter sock will be paid for at the contract unit price by the linear foot, complete in place. Diversion interceptors, type C will be paid for at the contract unit price by the linear foot.

The accepted quantities of excavation for detention or retention ponds will be paid for as common excavation in accordance with 203.28. Retention pond liners will be paid for as a lump sum.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Diversion Interceptor Type C	*LFT*
Fertilizer	*TON*
Filter Sock	*LFT*
Liner for Retention Pond	*LS*
Manufactured Surface Protection Product, _____ type	*SYS*
No. 2 Stone	*TON*
Sediment, Remove	*CYS*
Splashpad	*TON*
Temporary Check Dam, Revetment Riprap	*TON*
Temporary Filter Stone	*TON*
Temporary Check Dam, Traversable	*LFT*
Temporary Inlet Protection	*EACH*
Temporary Geotextile	*SYS*

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

PROPOSED NEW 205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL (DRAFT)

Temporary Mulch.....*TON*
Temporary Mulch Stabilization, _____..... *SYS*
type
Temporary Sediment Basin ..... *EACH*
Temporary Sediment Trap.....*TON*
Temporary Seed Mixture .....*LBS*
Temporary Silt Fence.....*LFT*
Temporary Slope Drain.....*LFT*

The cost of geotextile, trenching, backfilling, posts, fencing, and all necessary incidentals shall be included in the cost of silt fence.

The cost for diversion interceptor types A and B shall be included in the cost of other pay items.

The cost for stakes, trenching, backfilling, posts, and all necessary incidentals shall be included in the cost of temporary check dams, traversable.

The cost of interceptor ditches shall be included in the cost of other pay items in this section.

Payment for slope drain will include the standard metal end section, anchors, and all incidentals necessary to perform the work.

The cost of the materials, installation, inspection, maintenance, and removal of the temporary erosion and sediment control measures at off-site locations designated in 205.03 will not be measured for payment.

Except for the removal of sediments, the cost of materials, installation, maintenance and removal of temporary erosion and sediment control items shall be included in the cost of the respective items.

The cost of constructing, maintaining and removal of the construction entrance, other than those constructed by the Contractor for borrow and waste sites, shall be included in the cost of the No. 2 stone. No direct payment will be made for construction entrances for borrow and waste sites.

Costs associated with concrete washout will be included in the cost of concrete pay items.

Costs associated with filter stone replacement due to maintenance and sediment removal will be included in the costs of other pay items.

SECTION 621, BEGIN LINE 43, DELETE AS FOLLOWS:

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

PROPOSED NEW 205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL (DRAFT)

~~For temporary seeding, the seed bed, if not loose, shall be scarified. The area to be temporary seeded need not be made smooth and uniform.~~

SECTION 621, BEGIN LINE 268, DELETE AS FOLLOWS:

~~(f) Seed Mixture T~~

~~This seed mixture shall be used to establish a temporary cover for disturbed soil during the construction operations. Seed mixture T shall be used for soil stabilization and temporary ground cover. Temporary cover mixtures shall be placed as directed and be subject to seasonal limitations as defined herein. This mixture is not intended to be used as a permanent seed mixture. The mix shall be mulched in accordance with 621.05(c) when slopes exceed 3:1. From December 1 to March 14 and from June 16 to August 31, mulching alone shall be used to stabilize the soil. This mixture shall not be used to satisfy the requirements of the warranty bond.~~

~~1. Spring Mix~~

~~Spring mix shall be used from March 15 through June 15. This mixture shall be applied at the rate of 150 lb/ac (168 kg/ha). The mix shall consist of oats.~~

~~2. Fall Mix~~

~~Fall mix shall be used from September 1 through November 30. This mixture shall be applied at the rate of 150 lb/ac (168 kg/ha). This mix shall consist of winter wheat.~~

SECTION 621, BEGIN LINE 431, DELETE AS FOLLOWS:

Payment for mobilization and demobilization for seeding will be made for the initial movement to the project site so that permanent ~~or temporary seeding~~ or mulching work, as specified, is performed. When 1 or more operations are completed within the same mobilization, payment will be made for 1 mobilization. Payment will be for all work necessary to move personnel and equipment to and from the project site. Payment will also be made for additional mobilization, when directed.

SECTION 914, AFTER LINE 255, INSERT AS FOLLOWS:

6. Compost Mulch

Compost mulch shall consist of well-composted vegetable matter, leaves, yard trimmings, food scraps, composted manures, paper fiber, wood bark, class A bio-solids (as defined in Title 40 of the Code of Federal Regulations at 40 CFR Part 503), or any combination thereof. Compost shall be produced using an aerobic composting process meeting 40 CFR Part 503 regulations, including time and temperature data indicating effective weed seed pathogen, and insect larvae kill. Compost shall be well decomposed, stable, and weed free. Refuse free, (less than 1% by weight). Free of any contaminants and materials toxic to plant growth. Inert materials shall not exceed 1% by dry weight, pH of 5.5 to 8.0. Carbon-nitrogen ratio shall not exceed 100. Moisture content shall not exceed 45% by dry weight. Variable particle size with maximum dimension of 3 in. in length 1/2 in. in width, and 1/2 in. in depth. Compost mulch shall not be used in storm water runoff channels or anywhere that concentrated flow is anticipated.

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

PROPOSED NEW 205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL (DRAFT)

SECTION 914, AFTER LINE 503, INSERT AS FOLLOWS:

(h) Filter Sock

Filter socks for sediment control applications shall use a continuous tubular knitted mesh netting with 3/8 in. openings and constructed of 500 denier polypropylene and shall be set in place using 1 by 2 in. hardwood stakes or stakes of equivalent strength.

When using socks with compost soil bark mixture as a filler, the Contractor shall use a continuous knitted mesh netting with 3/8 in. openings and constructed of 5 mil thickness of photodegradable HDPE.

Filler particle size shall not be greater than 3 by 1/2 by 1/2 in. and be capable of staying within the sock.

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

108-C-192 TEMPORARY EROSION CONTROL MEASURES

(Note: Proposed changes are shown as highlighted in gray)

108-C-192 TEMPORARY EROSION CONTROL MEASURES

(Revised XX-XX-12)

The Standard Specifications are revised as follows:

SECTION 108, BEGIN LINE 107, DELETE AND INSERT AS FOLLOWS:

An amended Erosion Control Plan shall be submitted in accordance with 327 IAC 15-5 for those areas not included in the Department submittal ~~or~~ as necessary for changes initiated by the Contractor. Items to include consist of sequencing of operations, *stockpile sites, equipment storage sites, plant sites,* ~~borrow and disposal areas,~~ and haul roads as well as any revision to the Department's submittal. All appropriate erosion control items shall be in place prior to disturbing the project site. A copy of the amended plan shall be provided to the Engineer.

Borrow and disposal sites shall be in accordance with 203.08.

The Contractor shall submit the planned sequencing of erosion and sediment control measures to be used on the project to:

IDEM
Rule 5 Coordinator
100 N. Senate Avenue
Mail Code 65-42 Room 1255
Indianapolis, IN 46204

Indiana Dept. of Transportation
Senior Environmental Manager
Room N642
100 N. Senate Avenue
Indianapolis, IN 46204

When required by 327 IAC 15-5, stockpile and storage sites shall be permitted by an IDEM Notice of Intent, NOI. The Contractor shall submit either a new IDEM NOI or revise the original NOI for the project. A copy of the new or revised NOI shall be submitted to the Engineer prior to any operations at a stockpile or storage site.

All information shall be submitted and approved prior to land disturbing activities.

The Contractor shall designate 1 or more of its employees *as an Erosion Control Supervisor. The Erosion Control Supervisor shall* ~~to~~ be responsible for the preparation, submittal, and ensuring receipt of the approval of the amended erosion control plan. Such individual~~(s)~~ shall also be responsible for obtaining all other necessary permits including the wetland inspection and archaeological record check and field survey in accordance with 203.08, and for all environmental inspections. Such individual~~(s)~~ shall oversee the installation of all erosion control measures and shall conduct ~~regular~~ *weekly and post-event* inspections *and perform all other tasks related to the installation, maintenance, and removal of erosion control measures. The Erosion Control Supervisor shall accompany personnel from IDEM or other governmental agencies, as required, during site visits by*

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

108-C-192 TEMPORARY EROSION CONTROL MEASURES

those agencies. ~~and~~ *The Erosion Control Supervisor shall be responsible for* completion of all reports in accordance with 205.

A minimum of 14 days prior to commencing work, the Contractor shall prepare and submit to the Engineer, for approval, an erosion control plan that includes, at a minimum, the following items:

(a) Locations of all proposed soil stockpiles.

(b) Locations of all proposed equipment storage areas, fueling locations, construction trailers, batch plants, and designated concrete truck washout areas.

(c) Proposed construction sequence and phasing of erosion control measures.

(d) Location of all construction entrances where vehicles and equipment will enter and exit the site.

(e) Material handling and spill prevention plan, which shall include a list of expected materials that may be present on the site during construction operations, as well as a written description of how these materials will be handled to minimize the potential that the materials may enter the storm water runoff from the site.

(f) Statements that the erosion control measures for the project shall, at a minimum, be inspected on a weekly basis and within 24 h of every 1/2 in. ~~*(13 mm)*~~ *rain event.*

(g) Monitoring and maintenance plan for erosion control measures.

The erosion control plan shall be signed by the Erosion Control Supervisor. The Engineer will submit the erosion control plan to the Department's Office of Environmental Services Permit Coordinator.

The name~~(s)~~ of the ~~designated individual(s)~~ *Erosion Control Supervisor* shall be furnished the Engineer at, or prior to, the preconstruction meeting. Should the designated individual~~(s)~~ need to be replaced during the contract, replacements shall be designated within 7 calendar days and notification shall be furnished the Engineer.

Permanent erosion control measures shall be incorporated into the work at the earliest practicable time as the construction progresses to stabilize the site.

In order to minimize pollution to bodies of water, the practices and controls set out below shall be followed.

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

108-C-192 TEMPORARY EROSION CONTROL MEASURES

(a) When work areas are located in or adjacent to bodies of water, such areas shall be separated by a dike or other barrier to keep contained. Sediment disturbance of these bodies of waters shall be minimized during the construction and removal of such barriers.

(b) All waterways shall be cleared as soon as practicable of false-work, temporary piling, debris, or other obstructions placed during construction operations.

(c) Water from aggregate washing or other operations containing sediment shall be treated by filtration, a settling basin, or other means sufficient to reduce the sediment content.

(d) Pollutants such a fuels, lubricants, asphalt, sewage, wash water, or waste from concrete mixing operations, and other harmful materials shall not be discharged into existing bodies of water.

(e) All applicable regulations and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the contract.

SECTION 108, AFTER LINE 176, INSERT AS FOLLOWS:

The cost of preparation of the erosion control plan shall be included in the cost of the various erosion and sediment control items.

~~SECTION 205, AFTER LINE 33, INSERT AS FOLLOWS:~~

~~*Temporary erosion control measures shall be placed as soon as possible. Silt fence and sediment traps shall be installed prior to beginning earth disturbing activities.*~~

~~*Temporary seeding shall be placed on disturbed areas that are expected to be undisturbed for over 7 days or as directed by the Engineer.*~~

~~*Check dams shall be installed as soon as possible in areas of construction. Once ditches are to grade, permanent erosion control measures shall be placed as soon as possible and no later than 5 workdays after ditch grading is completed. During construction, if ditch flow patterns change, erosion control measures may need to be moved or adjusted so that no areas are left unprotected.*~~

~~*Pipe end sections and anchors shall be placed when the structure is installed. If the pipe end sections or anchors cannot be placed at the same time, temporary riprap splashpads shall be placed at the outlets of the pipes until the pipe end sections or anchors can be placed.*~~

~~SECTION 205, AFTER LINE 117, INSERT AS FOLLOWS:~~

~~***(o) Stable Construction Entrance***~~

REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

108-C-192 TEMPORARY EROSION CONTROL MEASURES

The Contractor shall provide a stable construction entrance at the points where construction traffic will enter onto an existing road. This entrance shall be a minimum of 12 ft wide, 50 ft long, and constructed of 12 in. of No. 2 stone. The radii shall be large enough to accommodate the vehicles utilizing the entrance. Additional stone may be required, as directed, to maintain the usefulness of the stable construction entrance. Where there in insufficient room for a stable construction entrance, other measures shall be taken to prevent the tracking of sediment onto the pavement.

SECTION 205, AFTER LINE 118, DELETE AND INSERT AS FOLLOWS:

205.04 Maintenance

Temporary erosion and sediment control measures shall be inspected by the Contractor*'s Erosion Control Supervisor* once every 7 days and after *each* rain activities *activity*. Inspections shall be documented and records shall be maintained by the Contractor, to be made available for review upon request. Records shall include, at a minimum, the date, the inspector's name, the maintenance and corrections needed based on this inspection, and the status of previously identified deficiencies. The temporary protection measures shall be returned to good working conditions within 48 h after inspection or as directed. Sediment shall be removed as approved and disposed of in accordance with 201.03 and 203.08. *Inspection records shall be kept until the entire contract is complete and has been permanently stabilized.*

SECTION 205, AFTER LINE 148, INSERT AS FOLLOWS:

No. 2 stone for stable construction entrances will be measured by the ton (megagram) in accordance with 109.01(b).

SECTION 205, LINE 166, INSERT AS FOLLOWS:

paid for at the contract unit price per each unit installed. *No. 2 stone for stable construction entrances will be paid for at the contract unit price per ton.*

SECTION 205, AFTER LINE 176, INSERT AS FOLLOWS:

No. 2 Stone .....TON (Mg)

SECTION 205, AFTER LINE 213, INSERT AS FOLLOWS:

The cost of constructing, maintaining, and removal of the stable construction entrance shall be included in the cost of No. 2 stone.

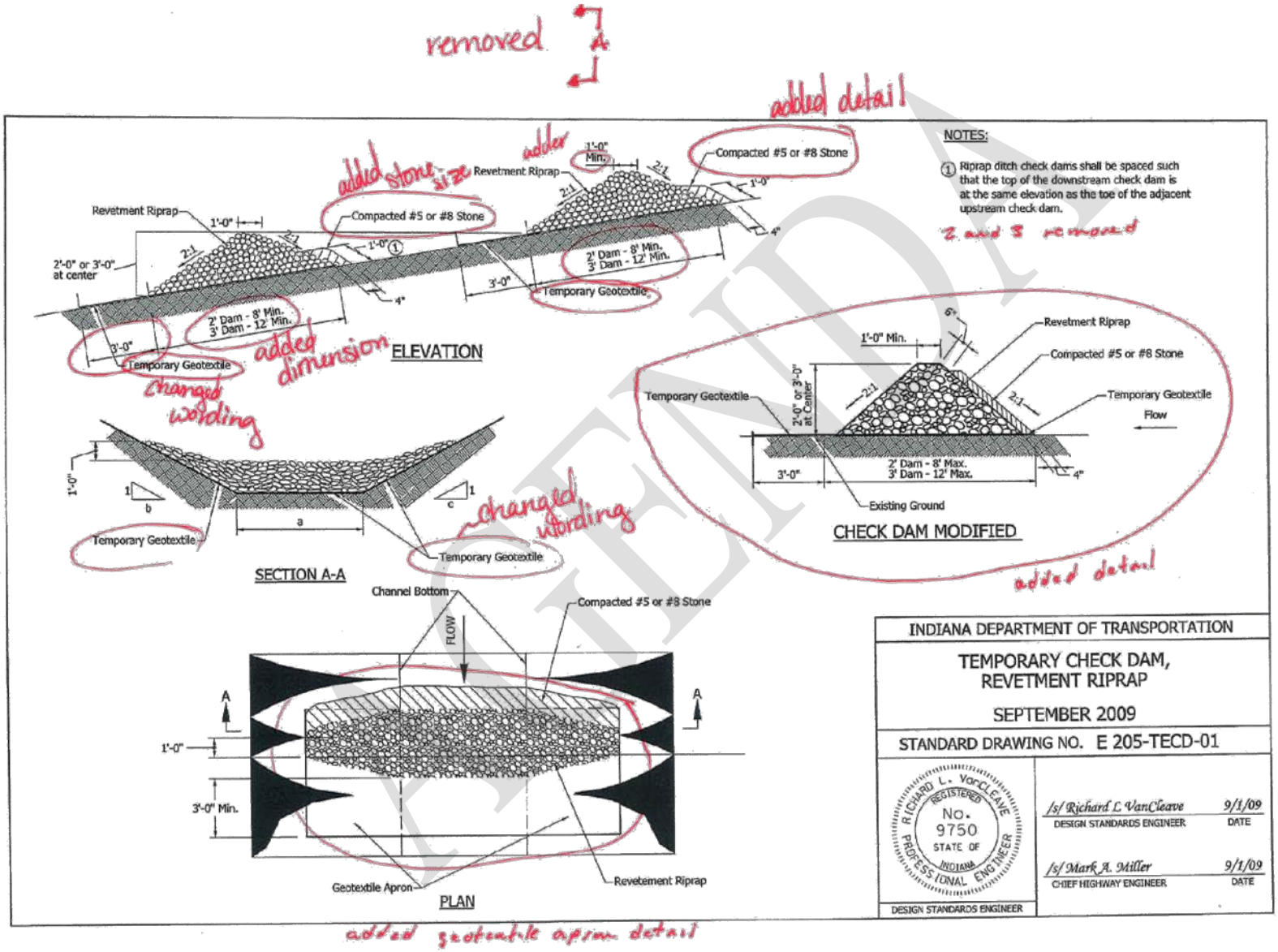
REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

108-C-192 TEMPORARY EROSION CONTROL MEASURES

THIS PAGE INTENTIONALLY LEFT BLANK

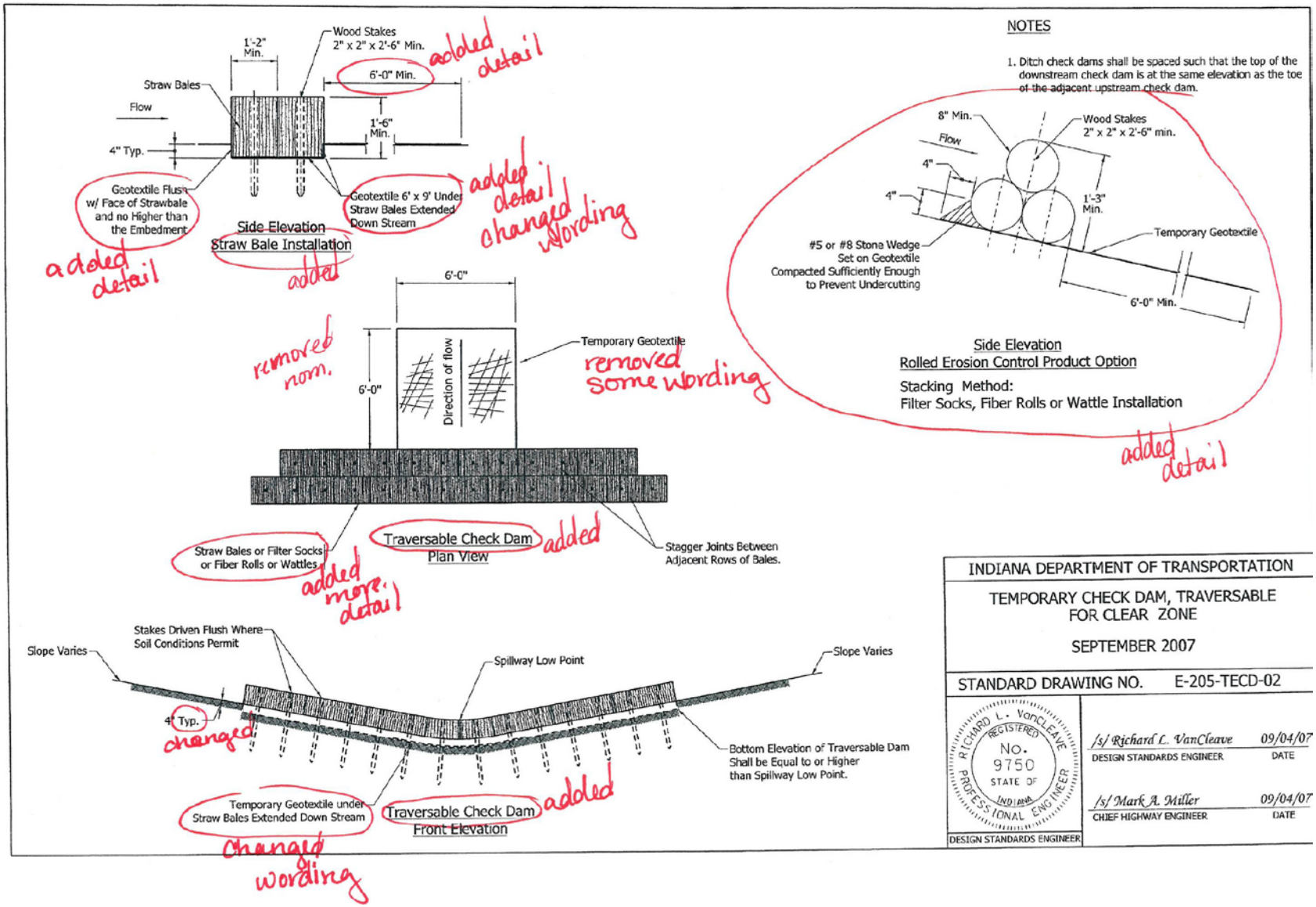
REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

EXISTING 205-TECD-01 TEMPORARY CHECK DAM, REVETMENT RIPRAP (WITH MARKUPS)



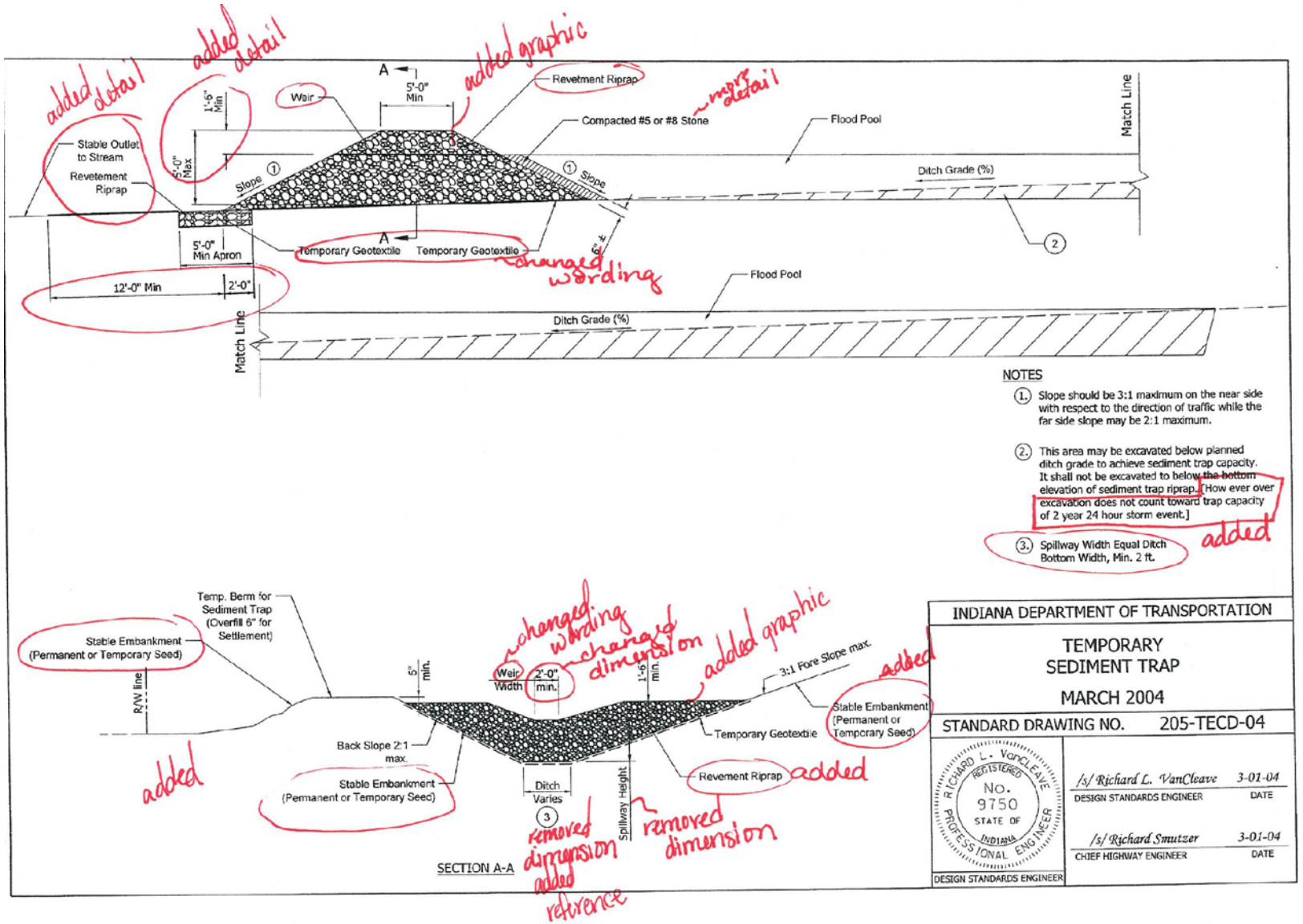
REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

EXISTING 205-TECD-02 TEMPORARY CHECK DAM, TRAVERSABLE FOR CLEAR ZONE (WITH MARKUPS)



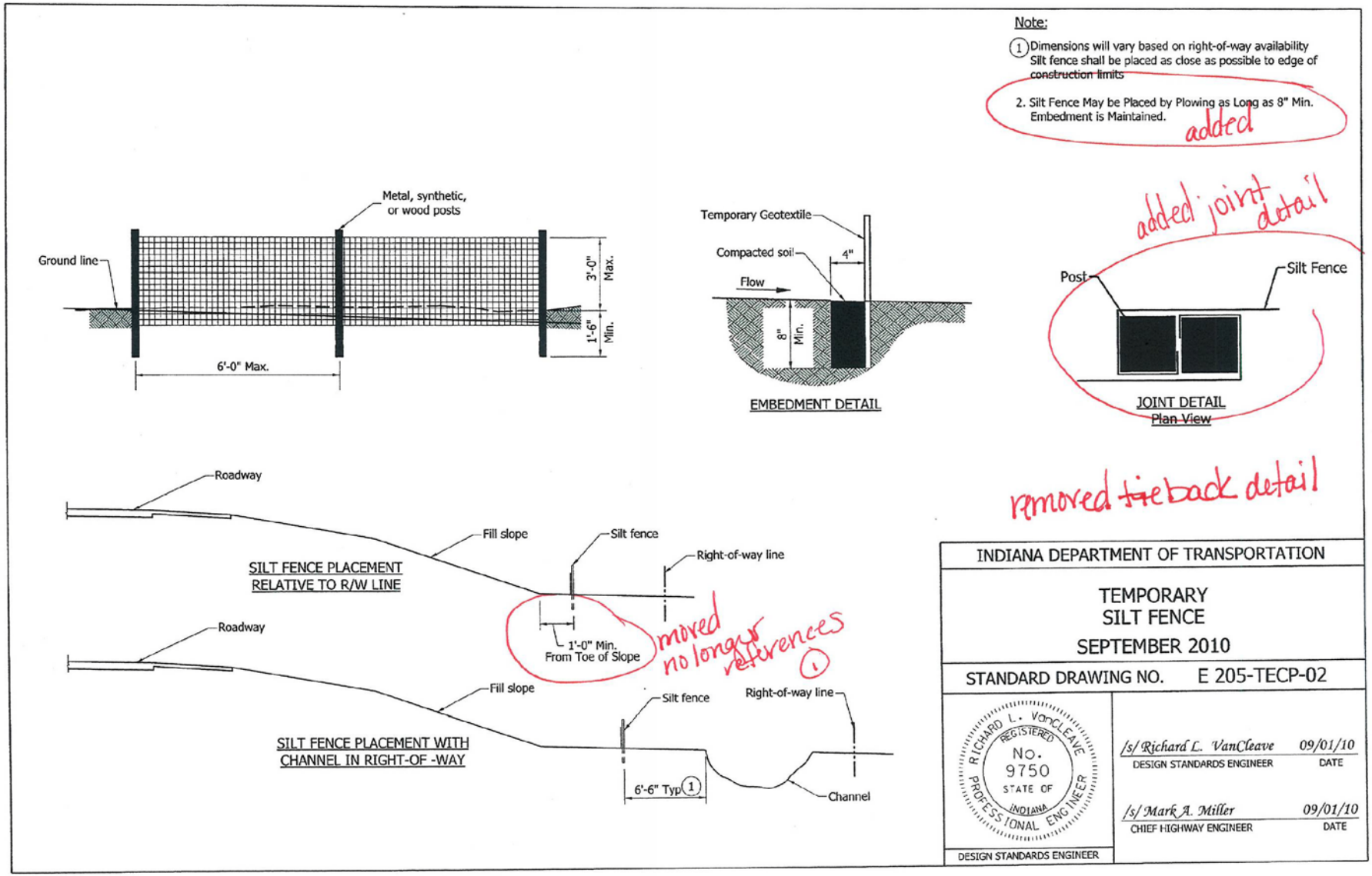
REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

EXISTING 205-TECD-04 TEMPORARY SEDIMENT TRAP (WITH MARKUPS)



REVISION TO SPECIAL PROVISIONS AND STANDARD DRAWINGS

EXISTING 205-TECP-02 TEMPORARY SILT FENCE (WITH MARKUPS)



COMMENTS AND ACTION

205-X-XXX TEMPORARY EROSION AND SEDIMENT CONTROL
108-C-192 TEMPORARY EROSION CONTROL MEASURES
205-TECD-01 TEMPORARY CHECK DAM, REVETMENT RIPRAP
205-TECD-02 TEMPORARY CHECK DAM, TRAVERSABLE FOR CLEAR ZONE
205-TECD-04 TEMPORARY SEDIMENT TRAP
205-TECP-02 TEMPORARY SILT FENCE

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: 101.01 pg 3; 109.05.1 pg 109; 203.09 pg 142, 144; 205 pg 171-175. Recurring Special Provision affected: 108-C-192 TEMPORARY EROSION CONTROL MEASURES Standard Sheets affected: 205-TECD-01; 205-TECD-02; 205-TECD-04; 205-TECP-02. Design Manual Sections affected: TBD GIFE Sections cross-references: SECTION 3	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y___N___ By ____ Addition or ____ Revision Received FHWA Approval? ____