INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING

Driving Indiana's Economic Growth

AGENDA

August 20, 2009 Standards Committee Meeting

MEMORANDUM

July 29, 2009

TO: Standards Committee

FROM: Mike Milligan, Secretary

RE: Agenda for the August 20, 2009 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on August 20, 2009 in the N755 Bay Window Conference Room. Please enter the meeting through the double doors directly in front of the conference room. The following agenda item are listed for consideration.

Page No.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

Electronic votes from June 18, 2009 Meeting Minutes:
Ayes: 9
Nays: 0
Abstained: 1

NEW BUSINESS

(No items on this agenda)

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

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

OLD BUSINESS

Item No.03 05/21/09 (2010 SS) Section 805	Mr. Shields	4
Standard Drawings	805-SGFB-03 and 805-SGFB-04	

NEW BUSINESS

Item No.01 08/20/09 (2010 SS) 734-x-xxx	Ms. Rearick CUT-WALL TYPE RETAINING WALL	10
Item No.02 08/20/09 (2010 SS) 400-R-553 412-R-549	Mr. Walker HMA Provisions Fog Seal	20
Item No.03 08/20/09 (2010 SS) Section 910.01	Mr. Shields Traffic Signs	29

cc: Committee Members (11)
FHWA (2)
ICA (1)

CONCEPTUAL

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT has been made aware of some inconsistencies between the 714 box culvert specification and the three sided culvert specification which could be hindering competition in the marketplace.

PROPOSED SOLUTION: Perform a thorough review of the 714 and 723 specification, making things consistent between the two specifications whenever possible.

APPLICABLE STANDARD SPECIFICATIONS: 714 & 723

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: Ch 31

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Anne Rearick

Title: Manager, Office of Structural Services

Organization: INDOT, Production Management Division

Phone Number: 232-5152

Date: July 27, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? NA

SPECIFICATION REVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

Due to the increasing use of solar-powered flashing beacons in rural areas, the district traffic engineers requested that a specification and standard drawing be developed for this type of traffic control device.

PROPOSED SOLUTION:

The proposed solution involves two standard drawings and revisions to Section 805 of the Standard Spec ifcations.

APPLICABLE STANDARD SPECIFICATIONS:

The applicable Standard Specifications are 805 and 922.

APPLICABLE STANDARD DRAWINGS:

The proposed Standard Drawings are 805 SGFB 03 and 805 SGFB 04. Four other relevant Standard Drawings are, 802 SNPL 02, 805 SGCF 03, 805 SGGR 03, and 805 SGCO 05.

APPLICABLE DESIGN MANUAL SECTION:

The applicable section of the Design Manual is Section 77-3.01.

APPLICABLE SECTION OF GIFE:

No applicable section known.

APPLICABLE RECURRING SPECIAL PROVISIONS:

The applicable recurring special provisions are 805-T-169 and 922-T-168.

Submitted By: Todd Shields

Title: Manager, Office of Technical Services

Organization: INDOT, Highway Operations Division

Phone Number: (317) 233-4726

Date: 7/14/2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? The 805 Sub-committee is inactive, so there is no applicable Sub-committee endorsement at this time.

REVISION TO THE 2010 SPECIFICATIONS

NOTE: The reader needs to recognize that much of Sections 805 and 922 are revised by Recurring Special Provisions 805-T-169 & 922-T-168.

SECTION 805, AFTER LINE 139, INSERT AS FOLLOWS:

Flashing beacons shall flash at a rate for each beacon of 50 to 60 times per minute with the illuminated period from 1/2 to 2/3 of the total cycle. If a second beacon is specified, the 2 beacons shall flash alternately. The backing members with hardware shall be compatible with the method of support.

SECTION 805, BEGIN LINE 155, INSERT AS FOLLOWS:

805.05 Placing Signal Heads

Mast arm and span mounted signal heads shall have 17 ft (5.2 m) minimum and 19 ft (5.8 m) maximum clearance over the roadway unless there are visual obstructions which require lowering the signal head. A signal head over the roadway shall not have a clearance of less than 15 ft (4.6 m). Such signal heads shall be located over the intersection as shown on the plans. Such signal heads shall have a uniform clearance, which will be determined. Signal heads not mounted over a paved roadway, on the top or side of a pole, shall not be less than 10 ft (3 m) nor more than 15 ft (4.6 m) above the sidewalk or, if none, above the pavement grade at the center of the roadway. Signal faces shall be directed to the proper approach lane in each direction. *Flasher signal faces that supplement signs shall be mounted with the bottom of the housing at not less than 3 ft (2.1 m) nor more than 13 ft (3.9 m) above the edge of pavement. Flasher signal faces that supplement signs shall be directed towards oncoming traffic.* Pedestrian signal faces shall be mounted with the bottom of the housing at not less than 7 ft (2.1 m) nor more than 10 ft (3 m) above the sidewalk. The pedestrian signal shall be in line with the pedestrian's vision at the appropriate crosswalk being used. Pedestrian push-buttons shall be mounted at a height of 3 1/2 to 4 ft (1.1 to 1.2 m) above the sidewalk as shown on the plans. A pedestrian actuated signal sign shall be mounted immediately above the push-button.

SECTION 805, BEGIN LINE 251, INSERT AS FOLLOWS:

805.08 Controller Cabinet, Signal Service, and Detector Housing Installation

Three document packets shall be prepared in accordance with 922.02(b) for each cabinet. Each packet shall be labeled with the name of the contract number, the intersection, the commission number of the signal and the date of installation. One packet shall be placed in the cabinet and the remaining two packets shall be submitted to the Engineer within 2 days after the signal is turned on. Information in the packets shall include all approved changes to the signal installation. All detector loop lead-in tags and detector rack labels shall reflect all approved changes to the signal installation.

Additional detector loop amplifier units and detector racks shall be supplied as directed by the Engineer. Additional detector racks shall include all cables or harnesses including, but not limited to a SDLC cable for each added rack, interface panels and a BIU to provide a complete and functional installation. Additional auxiliary BIU panels shall include all cables or harnesses, including, but not limited to a SDLC cable for each

REVISION TO THE 2010 SPECIFICATIONS

SECTION 805, CONTINUED.

additional auxiliary BIU panel, terminal strip on BIU panel and BIU to provide a complete and functional installation.

For signal cabinets installed by the Contractor, where no detector loop or lead-in work is included in the contract, the Contractor shall perform detector loop tagging, testing and vehicle simulator testing in accordance with 805.09, only to the extent of documenting the test readings and confirming that all existing detector loops are connected correctly and all detector related equipment in the cabinet is operating correctly.

The controller cabinet shall be mounted securely on a pole, pedestal, or concrete foundation. All cabinets on concrete foundations shall be installed with the anchor bolts inside. Controller cabinets on poles or pedestals shall be mounted at a height of 38 in. ± 2 in. (970 mm ± 50 mm). Pole mounted controller cabinets shall be fastened with two stainless steel bands as shown on the plans. Signal cables and lead-in cable shall be run in conduit from the controller cabinet to the signal support base and to detector housing as indicated on the plans. Galvanized steel elbows shall be used on the detector housing as shown on the plans.

The battery cabinet and program timing module for solar powered flashing beacons shall be approved by the Department in accordance with 922.02.

SECTION 805, BEGIN LINE 452, INSERT 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 support foundation, signal service, disconnect hanger, magnetometer detector, microloop detector, loop detector delay amplifier, signal handhole, signal detector housing, *solar powered flashers*, span catenary and tether, and span catenary for flasher will be measured by the number of units installed.

SECTION 805, BEGIN LINE 482, INSERT AS FOLLOWS:

805.16 Basis of Payment

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, signal steel strain pole, signal wood pole, signal cantilever structure, signal support foundation, signal pedestals, signal service, disconnect hanger, magnetometer detector, microloop detector, loop detector delay amplifier, signal handhole, signal detector housing, *solar powered flashers*, 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

REVISION TO THE 2010 SPECIFICATIONS

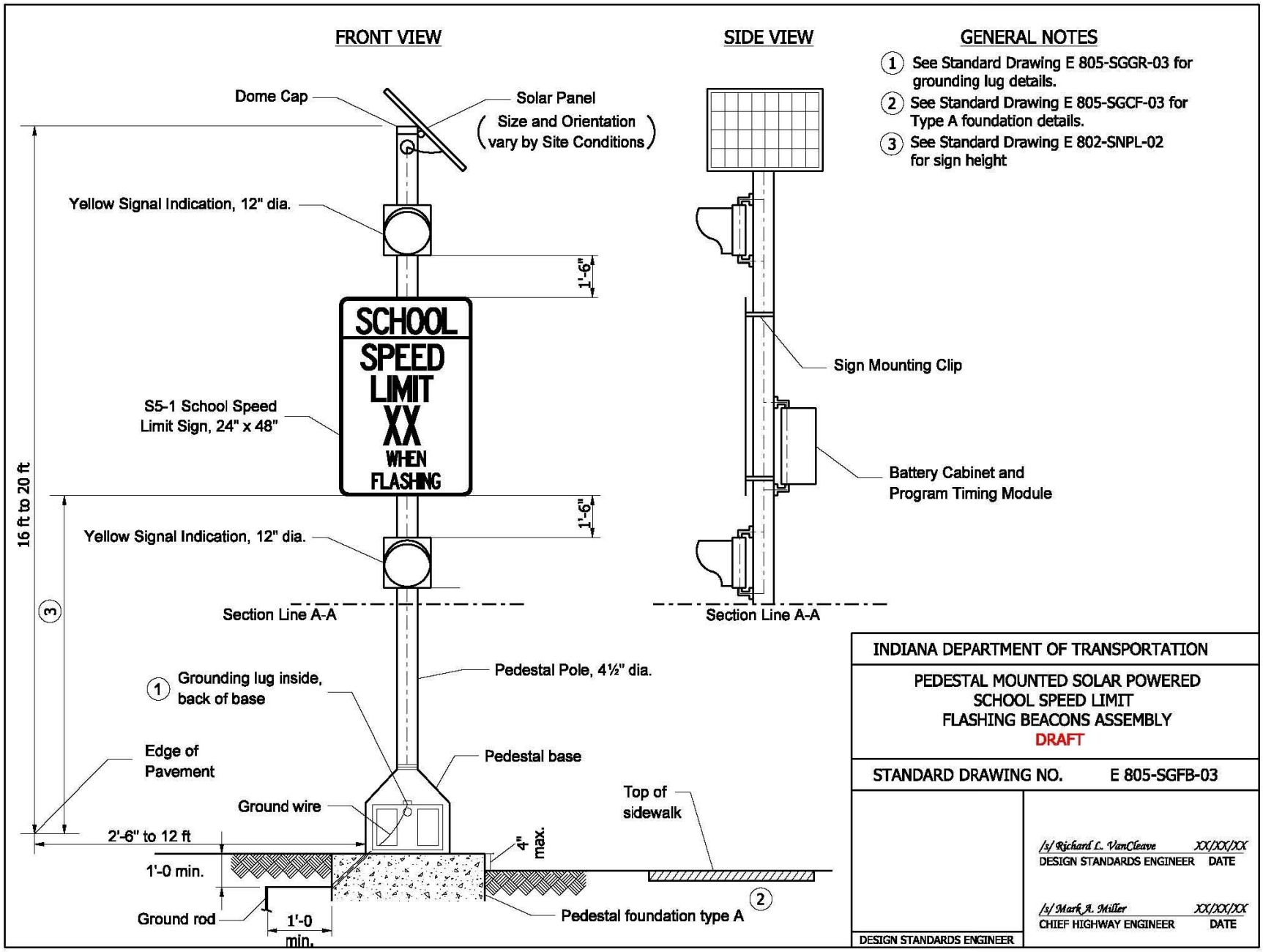
SECTION 805, CONTINUED.

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).

SECTION 805, BEGIN LINE 551, INSERT AS FOLLOWS:

Solar Powered Flasher ……*EACH*
Span and Catenary for Flasher ……EACH
Span, Catenary, and Tether ……..EACH
Traffic Signal Equipment, Remove ……..……...LS
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 solar powered flasher.



GENERAL NOTES

1. See Standard Drawing E 805-SGGR-03 for grounding lug details.
2. See Standard Drawing E 805-SGCF-03 for Type A foundation details.
3. See Standard Drawing E 802-SNPL-02 for sign height

INDIANA DEPARTMENT OF TRANSPORTATION

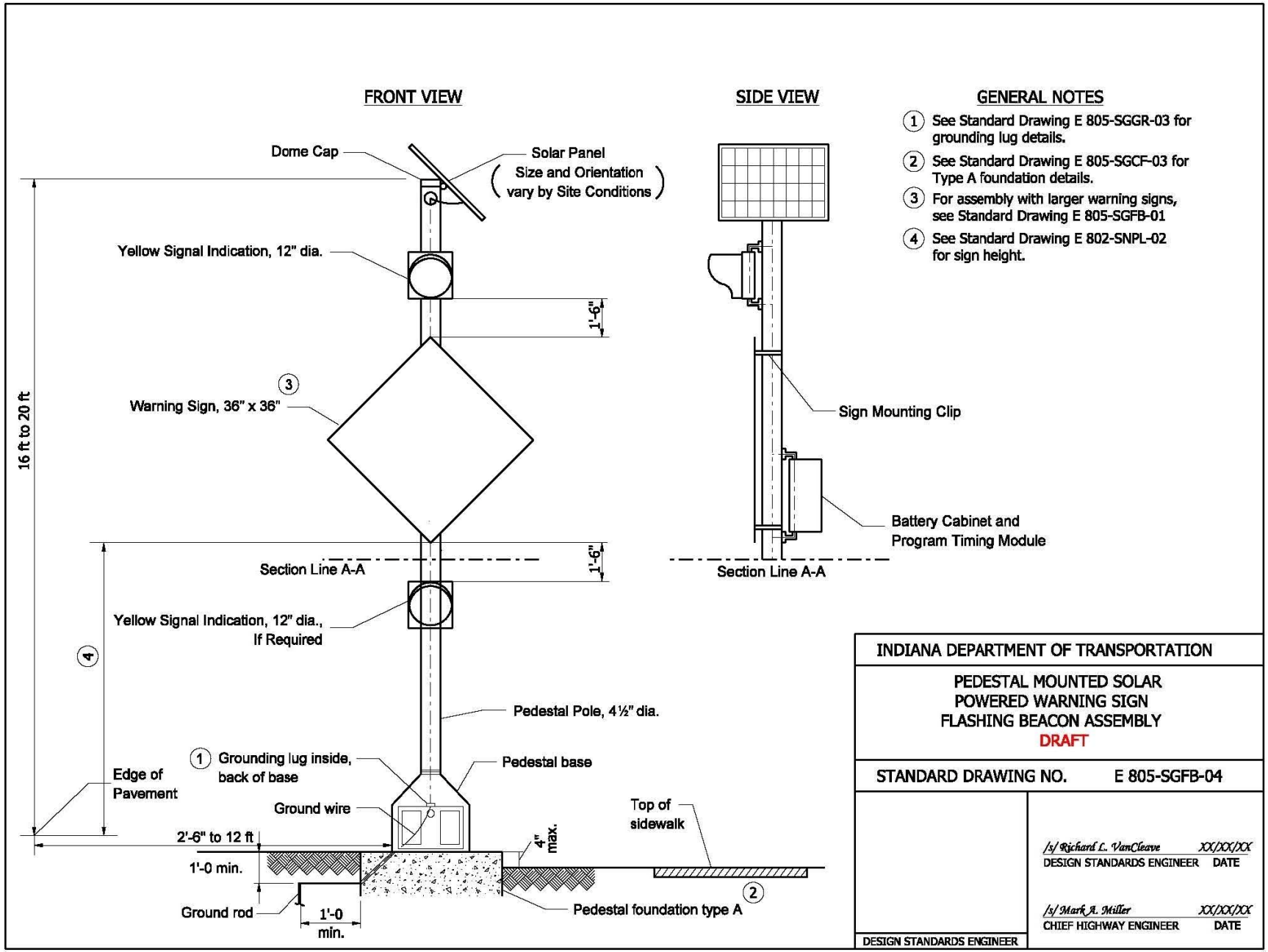
PEDESTAL MOUNTED SOLAR POWERED
SCHOOL SPEED LIMIT
FLASHING BEACONS ASSEMBLY
DRAFT

STANDARD DRAWING NO. E 805-SGFB-03

/s/ Richard L. VanCleave XX/XX/XX
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller XX/XX/XX
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER



GENERAL NOTES

1. See Standard Drawing E 805-SGGR-03 for grounding lug details.
2. See Standard Drawing E 805-SGCF-03 for Type A foundation details.
3. For assembly with larger warning signs, see Standard Drawing E 805-SGFB-01
4. See Standard Drawing E 802-SNPL-02 for sign height.

INDIANA DEPARTMENT OF TRANSPORTATION

PEDESTAL MOUNTED SOLAR
POWERED WARNING SIGN
FLASHING BEACON ASSEMBLY
DRAFT

STANDARD DRAWING NO. E 805-SGFB-04

/s/ Richard L. VanCleave XX/XX/XX
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller XX/XX/XX
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ACTION AND COMMENTS

SECTION 805

805-SGFB-03 - PEDESTAL MOUNTED SOLAR POWERED SCHOOL SPEED LIMIT FLASHING BEACONS ASSEMBLY.

805-SGFB-04 - PEDESTAL MOUNTED SOLAR POWERED WARNING SIGN FLASHING BEACONS ASSEMBLY.

Other sections containing specific cross references:

Motion: M
Second: M
Ayes:
Nays:

Action:

Passed as Submitted ____
Revised ____
Withdrawn ____

Recurring Special Provisions affected:
805-T-169
922-T-168

Standard Sheets affected:

___ 20__ Standard Specifications Book

___ 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? ____

SPECIFICATION REVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Cut walls have occasionally been constructed in the past and various USPs have been used. Because of the cut walls construction method, this can be a cost effective means to construct a retaining wall. There has been an ongoing attempt since 2002 to standardize the USPs into an RSP.

PROPOSED SOLUTION: Develop an RSP for cut wall applications.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: part of draft Chapter 68 - Earth Retaining Systems

APPLICABLE SECTION OF GIFE: tbd

APPLICABLE RECURRING SPECIAL PROVISIONS: create new RSP

Submitted By: Anne Rearick

Title: Manager, Office of Structural Services

Organization: INDOT, Production Management Division

Phone Number: 232-5152

Date: June 9, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? INDOT Retaining Wall Committee.

NEW RECURRING SPECIAL PROVISION
734-x-xxx CUT-WALL TYPE RETAINING WALL
(Adopted xx/xx/xx)

SECTION 734 - PERMANENT EARTH RETENTION SYSTEM FOR CUT-WALL APPLICATION

734.01 Description

This work shall consist of designing and constructing a permanent earth retention system utilizing a cut-wall application in accordance with 105.03. Cut-wall applications refer to a class of earth retention systems in which construction of the system is performed from the top of the wall to the base utilizing externally and/or internally stabilized elements. Geotechnical Engineering Circular No. 2 – Earth Retaining Systems, Report No. FHWA-SA-96-038 provides further discussion of cut-wall applications.

MATERIALS

734.02 Materials

Materials shall be in accordance with the following:

Excavation and Embankment	203
Geotextile Under Riprap	918.02
Pneumatically Placed Mortar	708
Prestressing Strand	910.01(b)7
Reinforcing Bars	910.01
Steel H Piles	915.02
Steel Pipe Piles	915.01
Steel Sheet Piling	910.21
Steel Welded Wire Reinforcement, Smooth and Deformed	910.01
Structural Concrete	702
Structural Steel	910.02
Structure Backfill	904.05

Structure backfill material used in the work described herein shall be structure backfill, type 2 in accordance with 211. The drainage pipe shall be underdrain pipe in accordance with 715.02(d).

CONSTRUCTION REQUIREMENTS

734.03 General Requirements

The Contractor performing the cut-wall work shall be prequalified in cut-wall applications from the Department's list of prequalified contractors.

All welding shall be done in accordance with 711.32.

734.04 Contractor Design Requirements

The permanent earth retention system utilizing a cut-wall application shall be designed by a Professional Engineer having experience in the design of at least six successfully completed permanent earth retention systems involving cut-wall applications in the past 5 years. The system designer may be either an employee of the Contractor or a separate consultant designer meeting the experience requirements stated above. The permanent earth retention system shall be designed using the procedure described in the AASHTO *LRFD Bridge Design Specifications,* or in the FHWA report SA-96-069, *Manual for Design and Construction Monitoring of Soil Nail Walls.* The required partial safety factors or allowable strength factors for Service Load Design, SLD, and load and resistance factors for Load and Resistance Factor Design, LRFD, shall be in accordance with the above-referenced publications. The minimum factor of safety for SLD global stability or minimum required LRFD global stability shall be in accordance with the above-referenced publications, unless specified otherwise. Structural design of an individual wall element not addressed in the FHWA report shall be designed in accordance with the AASHTO specifications. Geometric data and design criteria including shear strength parameters and unit weights for soil and rock, corrosion protection, internal and external drainage requirements, horizontal and vertical alignment of the wall, and all known site and construction constraints, wall facing, and facing architectural requirements shall be as shown on the plans.

(a) Design Calculations

Design calculations shall include, but not be limited to:

1. A written summary report which describes the overall design.

2. Applicable code requirements and design references.

3. Design cross-section(s) geometry including soil/rock strata and location, magnitude and direction of design slope, external surcharge loads, and piezometric levels with the most-critical slip surface shown along with the minimum calculated SLD factor of safety for global stability or minimum required LRFD global stability soil resistance/load ratio.

4. Design criteria including undrained and drained shear strength parameters for soil and rock (i.e., angle of internal friction and cohesion), and dry and moist/saturated unit weights.

5. Unit bond resistances for externally and internally stabilized elements.

6. Partial safety factors/strength factors for SLD or load and resistance factors for LRFD used in the design on the pullout

resistance, surcharges, dry and moist/saturated unit weights of soil and rock, and all materials (e.g., shotcrete, steel and concrete).

7. Seismic design acceleration coefficient.

8. Design calculation sheets with the contract number, designation number, wall location and designation, date of preparation, initials of designer and checker, and page number shown on each page. Provide an index page with the design calculations.

9. Design notes including an explanation of any symbols and computer programs used in the design.

10. Structural design calculations for any temporary and permanent facing(s) and facing connections including consideration of flexural and shear strength of the facing and any externally stabilized elements, tensile strength of any headed studs, upper cantilever, minimum reinforcement ratio, mechanical splices, welds, built-up sections, and cover and splice requirements.

(b) Working Drawings

The limits of the wall and ground survey data shall be verified before preparing the drawings. Working drawings shall include all details, dimensions, quantities, ground profiles, cross-sections necessary to construct the wall, and the following:

1. A plan view of the wall(s) identifying the following:

   a. A reference centerline and elevation datum.

   b. The offset from the construction centerline to the finished face of the wall at its base and at all changes in horizontal alignment.

   c. Beginning and ending stations of the wall.

   d. Right-of-way and permanent or temporary construction easement limits, location of all known active and abandoned existing utilities, adjacent structures or other potential interferences. The centerline of any drainage structure or drainage pipe behind, passing through, or passing under the wall shall be identified.

NEW RECURRING SPECIAL PROVISION
734-x-xxx CUT-WALL TYPE RETAINING WALL (CONTINUED).

e. Limit of externally and internally stabilized elements.

f. Subsurface exploratory locations shown on a plan view of the proposed wall alignment with appropriate reference base lines to fix the locations of the explorations relative to the wall.

2. An elevation view of the wall(s) identifying:

a. The elevation at the top of the wall, at all horizontal and vertical break points, and at least every 30 ft (10 m) along the wall.

b. Elevations at the base and top of the wall for casting the facing.

c. Beginning and ending stations of the wall.

d. The distance along the face of the wall to all steps in the base of the wall.

e. Elevation views of the wall showing all externally and internally stabilized elements as well as vertical and horizontal spacing; and the location of drainage elements and permanent facing expansion/contraction joints along the wall length.

f. Existing and finished grade profiles both behind and in front of the wall.

3. Design parameters and applicable codes.

4. General notes for constructing the wall including sequencing or other special construction requirements including dewatering, if required.

5. Horizontal and vertical curve data affecting the wall and control points. Match lines or other details to relate the wall stationing to centerline stationing.

6. A listing of the summary of quantities on the elevation drawing of each wall showing estimated square yards (square meters) of exposed wall face areas and other pay items.

NEW RECURRING SPECIAL PROVISION
734-x-xxx CUT-WALL TYPE RETAINING WALL (CONTINUED).

7. Typical sections including staged excavation elevations, wall elements, and corrosion protection details.

8. Typical details of production and test anchors or nails defining the orientation and dimensional relationships of the unbonded and bonded lengths.

9. Details, dimensions, and schedules for all externally and internally stabilized elements, reinforcing steel, wire mesh, bearing plates, headed studs, etc. and/or attachment devices for pneumatically placed mortar, cast-in-place, or prefabricated facings.

10. Details and dimensions for appurtenances such as barriers, coping, drainage gutters, fences, etc.

11. Details for constructing the wall around drainage facilities.

12. Details for terminating the wall and adjacent slope construction.

13. Facing finishes, color and architectural treatment requirements for permanent facing elements.

(c) Submittals

The Contractor shall submit design calculations and working drawings as described herein and in accordance with 105.02. The calculations and drawings shall be signed and sealed by a professional engineer. This professional engineer shall have overall responsibility for both the design and construction.

Within 30 days after completion of the work, as-built drawings shall be submitted to the Engineer. Revised design calculations signed by the professional engineer shall be provided for all design changes made during the construction of the permanent earth retention system.

734.05 Quality Control Plan

At least 30 calendar days before the planned start of the wall construction, the Contractor shall submit a quality control plan for approval. The plan shall include, but not be limited to, personnel qualifications, wall construction procedures and sequencing, a verification testing program, and a performance monitoring program. No work shall begin until written notice has been received from the Engineer that the QCP has been accepted.

NEW RECURRING SPECIAL PROVISION
734-x-xxx CUT-WALL TYPE RETAINING WALL (CONTINUED).

(a) Personnel Qualifications

A Professional Engineer employed by the Contractor and having experience in the construction of at least six completed permanent earth retention systems involving cut-wall applications over the past 5 years shall supervise the work. The Contractor shall not use consultants or manufacturer's representatives to satisfy the supervising Engineer requirements. A field superintendent or field foreman shall have 5 years of experience in the supervision of permanent earth retention systems involving cut-wall applications.

(b) Verification Testing Program

The program shall include a verification testing program of all production and test anchors/nails. The program shall identify the test locations, the type of test (i.e., proof, performance and/or pullout), testing procedures, acceptance criteria, and load and measuring devices to be used.

(c) Performance Monitoring Program

The program shall identify points of monitoring interest, in accordance with Geotechnical Engineering Circular No. 2 – Earth Retaining Systems, Report No. FHWA-SA-96-038, and the frequency of monitoring during and following construction of the wall. The program shall also include a baseline survey for points of monitoring interest.

During construction, the Contractor shall immediately notify the Engineer if signs of ground movement in the vicinity of the wall, increased size of old cracks or separation of joints in structures, foundations, streets or paved and unpaved surfaces are observed. The Contractor shall monitor the performance of the wall and movements of buildings, roads, or other facilities within a distance of three times the excavation depth for of the wall. If the Engineer determines that the movements exceed those anticipated for construction and require corrective action, the Contractor shall take corrective actions necessary to arrest the movement or perform repairs.

734.06 Performance Requirements

Performance monitoring by the Contractor shall be done during construction and for a period of not less than one year following the completion of the wall or as directed. The Contractor shall post a warranty bond for the performance monitoring that takes place after the contract is completed. The Contractor shall make prompt and continuous evaluations of the test and monitoring data and performance of the wall. The Contractor, if necessary during the monitoring period, shall immediately take steps to correct deficiencies in the capacities of individual elements or other corrective measures which may be required to prevent damage or excessive movement of the wall and adjacent facilities. The Contractor shall submit all test and monitoring data to the Engineer on a weekly basis or as otherwise directed.

NEW RECURRING SPECIAL PROVISION
734-x-xxx CUT-WALL TYPE RETAINING WALL (CONTINUED).

The Contractor shall limit maximum lateral wall movements during and following construction of the wall to ____ percent of the excavation depth that is shown on the plans. The Contractor shall limit maximum settlement of the ground behind the wall during and following construction of the wall to ____ percent of the maximum excavation depth that is shown on the plans. If these values are exceeded, the Contractor shall submit in writing to the Engineer a course of action which identifies appropriate measures to arrest and/or limit any additional movement/settlement.

734.07 Method of Measurement

This work will be measured by the square yard (square meter) of exposed face area of cut wall above finished grade.

734.08 Basis of Payment

The accepted quantities of this work will be paid for at the contract unit price per square yard (square meter) for cut wall. Payment will be made under.

Cut Wall, No. ____ ..... SYS (m2)

The costs of all labor, excavation, structure backfill, equipment, materials, tests, and incidentals necessary to design, construct and monitor the wall including the internal drainage and any temporary construction facing or permanent facing, if applicable, and correction of deficiencies which may be required to prevent damage or excessive movement of the wall shall be included in the cost of this work. The costs of providing corrective actions shall be at no additional cost to the Department.

Action and Comments

734-x-xxx CUT-WALL TYPE RETAINING WALL.

Other sections containing specific cross references:

Motion: M
Second: M
Ayes:
Nays:

Action:

Passed as Submitted ____
Revised ____
Withdrawn ____

Recurring Special Provisions affected:
734-x-xxx

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Sheets affected:

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? ____

SPECIFICATION REVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: New material for fog seal.

PROPOSED SOLUTION: The current RSP for fog seal specifies a modified AE PL as the only material. This has caused some confusion from both our in house users and suppliers. In the current liquid bituminous QPA for in house use, we added a new material for fog seal (AE F). This has been used successfully in 5 Districts this year. The proposed spec change is to delete the modified AE PL and add the new AE F.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 52-11.0

APPLICABLE SECTION OF GIFE:Unknown

APPLICABLE RECURRING SPECIAL PROVISIONS: 412-R-549 (fog seal) and 400-R-553 (material)

Submitted By: Ron Walker

Title: Manager, Office of Materials Management

Organization: INDOT, Construction Management Division

Phone Number: 317-610-7251, ext 204

Date: July 24, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? Ad-hoc (Mike Prather, Adam Redmon - AMI)

REVISED RECURRING SPECIAL PROVISION
400-R-553

400-R-553 HMA PROVISIONS

(Revised 08-20-09)

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 46, INSERT AS FOLLOWS:

ESAL CATEGORY	ESAL
1	< 300,000
2	300,000 to < 3,000,000
3	3,000,000 to < 10,000,000
4	10,000,000 to < 30,000,000
5	≥ 30,000,000

QC/QA HMA may be produced as warm-mix asphalt, WMA, by using a water-injection foaming device for ESAL category 1, 2 and 3 mixtures. The DMF shall list the minimum plant discharge temperature for HMA and WMA as applicable to the mixture.

SECTION 401, BEGIN LINE 135, INSERT AS FOLLOWS:

A maximum of 15.0% RAP or 3.0% ARS by weight (mass) of the total mixture may be used in ESAL category 3, 4, or 5 surface mixtures and open graded mixtures. The *RAP* recycled material for the ESAL category 3, 4, or 5 surface mixtures shall be 100% passing the 3/8 in. (9.5 mm) sieve and 95 to 100% passing the No. 4 (4.75 mm) sieve.

A maximum of 25.0% RAP or 5.0% ARS by weight (mass) of the total mixture may be used in WMA for ESAL category 1, 2 and 3 mixtures except ESAL category 3 surface mixtures.

SECTION 401, BEGIN LINE 158, INSERT AS FOLLOWS

401.08 Job Mix Formula

A job mix formula, JMF, shall be developed by a certified HMA producer. A JMF used in the current or previous calendar year that was developed to N_{des} will be allowed. The mixture compaction temperature shall be 300 ± 9°F (150 ± 5°C) for dense graded mixtures and 260 ± 9°F (125 ± 5°C) for open graded mixtures. The JMF *shall list the minimum plant discharge temperature for HMA and WMA as applicable to the mixture.* The JMF for each mixture shall be submitted to the Engineer and shall use the same MAF as the DMF.

SECTION 401, BEGIN LINE 493, INSERT AS FOLLOWS:

If the Lot PWL for any one of the properties is less than 50 or a sublot has an air void content less than 1.0*% or greater than 7.0%*, the lot will be referred to the Office of Materials Management for adjudication as a failed material in accordance with normal Department practice as listed in 105.03.

SECTION 401, BEGIN LINE 622, INSERT AS FOLLOWS:

401.20 Appeals

REVISED RECURRING SPECIAL PROVISION
400-R-553, CONTINUED

If the QC test results do not agree with the acceptance test results, a request, along with the QC test results, may be made in writing for additional testing. The appeal sample will be analyzed in a lab different than the lab that analyzed the original sample when requested by the Contractor. Additional testing may be requested for one or more of the following tests: MSG, BSG of the gyratory specimens, binder content, or BSG of the density cores. The request for the appeal for MSG, BSG of gyratory specimens, binder content or BSG of the density cores shall be submitted within seven calendar days of receipt of the Department's written results for ~~that~~ *the lot accepted under 401.19(a) or the* sublot *accepted under 401.19(b)*. The sublot and specific test(s) shall be specified at the time of the appeal request. Only one appeal request per *lot for mixture accepted under 401.19(a) or* sublot *for mixture accepted under 401.19(b)* is permitted. Upon approval of the appeal, the Engineer will perform additional testing as follows.

SECTION 402, BEGIN LINE 39, INSERT AS FOLLOWS:

Mixture Type	Type A	Type B	Type C	Type D
Design ESAL	200,000	2,000,000	9,000,000	11,000,000
Surface	9.5 mm	9.5 mm	9.5 mm	9.5 mm
	12.5 mm	*12.5 mm*	*12.5 mm*	*12.5 mm*
Surface – PG Binder	64-22	64-22	70-22	70-22
Intermediate	*12.5 mm*	*12.5 mm*	*12.5 mm*	*12.5 mm*
	19.0 mm	19.0 mm	19.0 mm	19.0 mm
Intermediate – PG Binder	64-22	64-22	64-22	70-22
Base	*19.0 mm*	*19.0 mm*	*19.0 mm*	*19.0 mm*
	25.0 mm	25.0 mm	25.0 mm	25.0 mm
Base – PG Binder	64-22	64-22	64-22	64-22

HMA may be produced as warm-mix asphalt, WMA by using a water-injection foaming device for temporary HMA mixtures and type A, B and C mixtures. The DMF shall list the minimum plant discharge temperature for HMA and WMA as applicable to the mixture.

SECTION 402, BEGIN LINE 119, INSERT AS FOLLOWS:

A maximum of 15.0% RAP or 3.0% ARS by weight (mass) of the total mixture may be used in type C and D surface mixtures. *The RAP* recycled material *for the type C and D surface mixtures shall be* 100% passing the 3/8 in. (9.5 mm) sieve and 95% to 100% passing the No. 4 (4.75 mm) sieve.

A maximum of 25.0% RAP or 5.0% ARS by weight (mass) of the total mixture may be used in WMA for temporary HMA mixtures and type A, B and C mixtures except type C surface mixtures.

SECTION 410, BEGIN LINE 44, DELETE AND INSERT AS FOLLOWS:

410.05 SMA Mix Design

The DMF shall be determined for each mixture from a SMA mix design by a design laboratory selected from the Department's list of approved Mix Design

REVISED RECURRING SPECIAL PROVISION
400-R-553, CONTINUED

Laboratories. A SMA mixture shall be designed in accordance with AASHTO M 325 and R ~~35~~ *46*.

SECTION 410, BEGIN LINE 406, INSERT AS FOLLOWS:

410.20 Appeals

If the QC test results do not agree with the acceptance test results, a request, along with the QC test results, may be made in writing for additional testing. Additional testing may be requested for one or more of the following tests: binder content, gradation, or MSG of the mixture samples and bulk specific gravity of the density cores. The appeal request shall be submitted within seven calendar days of receipt of the Department's written results for that sublot. The *request for the appeal for MSG, BSG of the density cores or binder content and gradation shall be submitted within seven calendar days of receipt of the Department's written results for that sublot. The* sublot and specific tests shall be specified at the time of the appeal request. Only one appeal request per sublot is permitted. Upon approval of the appeal, the Engineer will perform additional testing.

SECTION 902, BEGIN LINE 87, INSERT AS FOLLOWS:

AE-F is a medium setting, hard penetration, diluted emulsion intended for fog sealing.

SECTION 902, BEGIN LINE 87, DELETE AND INSERT AS FOLLOWS:

The requirements for asphalt emulsions shall be in accordance with the following:

Characteristic [1] [2]	AASHTO Test Method	RS-2	HFRS-2	AE-90	AE-90S	AE-T	*AE-F*	*SS-1h*	AE-150	AE-150L	AE-PL	AE-PMT [6]	AE-PMP [6]
Test on Emulsion													
Viscosity, Saybolt Furol at 25°C, min.	~~T 72~~*T 59*			50				*20*	50				20+
Viscosity, Saybolt Furol at 25°C, max.	~~T 72~~*T 59*					100	*100*	*100*		100	115	100	
Viscosity, Saybolt Furol at 50°C, min.	~~T 72~~*T 59*	75	75		50				75				
Viscosity, Saybolt Furol at 50°C, max.	~~T 72~~*T 59*	400	400						300				
Demulsibility w/35 mL, 0.02N CaC12, %, min.	T 59	50	50		30		*25*						
Demulsibility w/50 mL, 0.10N CaC12, %, min.	T 59			75		75						25+	25+
Oil Distillate by Distillation, mL/100 g Emul [3]	T 59	4.0	4.0	4.0	3.0	4.0	*4.0*	*4.0*	7.0	7.0	3.0	3.0	3.0
Residue by Distillation, %, min.	T 59	68	68	68	65 [5]	54	*27*	*57*	68	60	30		
Residue by Distillation, % max.	T 59					62	*35*			65			
Sieve Test, %, max.	T 59	0.10	0.10	0.10	0.10	0.10	*0.10*	*0.10*	0.10	0.10	0.10	0.10	0.10
Penetrating Ability, mm, min.	902.02(w)										6		
Stone Coating Test, %	902.02(t)3a			90					90	90			
Settlement, %, max.	T 59	5	5	5									
Storage Stability, %, max.	T 59				1								
Asphalt Content by Distillation at 204°C, %, min.												54	45
Asphalt Content by Distillation at 204°C, %, max.												62	
Tests on Residue													
Penetration (0.1 mm) at 25°C, 100g, 5 s, min. [4]	T 49	100	100	100	90	50	*40*	*40*				50	300+
Penetration (0.1 mm) at 25°C, 100g, 5 s, max. [4]	T 49	200	200	200	150	200	*90*	*90*				200	
Penetration (0.1 mm) at 25°C, 50g, 5 s, min. [4]	T 49								100	100			
Penetration (0.1 mm) at 25°C, 50g, 5 s, max. [4]	T 49								300	300			
Ductility at 25°C, mm, min.	T 51	400	400	400		400		*400*					
Solubility in Org. Sol., %, min.	T 44	97.5	97.5	97.5	97.5	97.5	*97.5*	*97.5*	97.5	97.5	97.5	97.5	97.5
Float Test at 50°C, s, max. [4]	T 50												
Float Test at 60°C, s, min. [4]	T 50		1200	1200	1200	1200			1200	1200			
Force Ratio	T 300				0.3								
Elastic Recovery, at 4°C	T 301				58								
Polymer Content by Infrared												1.5+	1.5+

Notes: (1) Broken samples or samples more than 10 days old will not be tested.
(2) Combined percentage of the residue and oil distillate by distillation shall be at least 70% (note the different units – ml for oil and % for residue).
(3) Oil distillate shall be in accordance with ASTM D 396, table 1, grade no. 1
(4) The Engineer may waive the test.
(5) Maximum temperature to be held for 15 minutes 200 ± 5°C.
(6) Asphalt shall be polymerized prior to emulsification.

REVISED RECURRING SPECIAL PROVISION
412-R-549

412-R-549 FOG SEAL

(Revised 08-20-09)

The Standards Specifications are revised as follows:

SECTION 412, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 412 – FOG SEAL

412.01 Description

This work shall consist of applying asphalt emulsion to the pavement surface in accordance with 105.03.

MATERIALS

412.02 Materials

Materials shall be in accordance with the following:

Asphalt Emulsion, AE~~-PL-~~F.....902.01(b)
Fine Aggregate.....904.02

CONSTRUCTION REQUIREMENTS

412.03 Equipment

A distributor in accordance with 409.03(a) shall be used.

412.04 Weather Limitations

Fog seal operations shall not be conducted on a wet pavement, when the ambient air or pavement temperature is below 60°F (16°C), or when other unsuitable conditions exist, unless approved by the Engineer. Fog seal shall not be applied to travel or auxiliary lanes before May 1 or after October 1.

412.05 Preparation of Surface

Surfaces shall be clean and free of any foreign or loose material.

All castings, detector housings, and snowplowable raised pavement markers shall be covered to prevent coating with fog seal prior to application of the fog seal. These coverings shall be removed prior to opening to traffic.

412.06 Application of Asphalt Material

The asphalt material shall be applied uniformly at a rate within ± 0.02 gal./syd (0.065 L/sq m) of the rate shown on the plans. Asphalt material shall be applied in such a way as to ensure even and uniform coverage to the pavement surface.

412.07 Protection of Surface

REVISED RECURRING SPECIAL PROVISION
412-R-549

Fine aggregate or other approved blotting material shall be applied to pedestrian crosswalks, driveways or other areas as directed by the Engineer. Brooming of ponded areas shall be required prior to placing traffic on treated surfaces, as directed.

Traffic shall not be permitted on the freshly sealed surface until the asphalt material has sufficiently cured to prevent tracking.

412.08 Method of Measurement

Fog seal will be measured by the square yard (square meter) complete in place.

412.09 Basis of Payment

Fog seal will be paid for at the contract unit price per square yard (square meter).

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Fog Seal	*SYS (m2)*

The costs of all asphalt materials, fine aggregate, surface preparation, and all other necessary incidentals shall be included in the cost of the pay item.

~~SECTION 902, BEGIN LINE 89, INSERT AS FOLLOWS:~~

~~Characteristic~~ [(1) (2)]	~~AASHTO Test Method~~	~~RS-2~~	~~HFRS-2~~	~~AE-90~~	~~AE-90S~~	~~AE-T~~	~~AE-150~~	~~AE-150L~~	~~AE-PL~~	~~AE-PMT~~ [(6)]	~~AE-PMP~~ [(6)]
~~Test on Emulsion~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Viscosity, Saybolt Furol at 25°C, min.~~	~~T 72~~	~~-~~	~~-~~	~~50~~	~~-~~	~~-~~	~~50~~	~~-~~	~~-~~	~~-~~	~~20+~~
~~Viscosity, Saybolt Furol at 25°C, max.~~	~~T 72~~	~~-~~	~~-~~	~~-~~	~~-~~	~~100~~	~~-~~	~~100~~	~~115~~	~~100~~	~~-~~
~~Viscosity, Saybolt Furol at 50°C, min.~~	~~T 72~~	~~75~~	~~75~~	~~-~~	~~50~~	~~-~~	~~75~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Viscosity, Saybolt Furol at 50°C, max.~~	~~T 72~~	~~400~~	~~400~~	~~-~~	~~-~~	~~-~~	~~300~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Demulsibility w/35 mL, 0.02N CaC12, %, min.~~	~~T 59~~	~~50~~	~~50~~	~~-~~	~~30~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Demulsibility w/50 mL, 0.10N CaC12, %, min.~~	~~T 59~~	~~-~~	~~-~~	~~75~~	~~-~~	~~75~~	~~-~~	~~-~~	~~-~~	~~25+~~	~~25+~~
~~Oil Distillate by Distillation, mL/100 g Emul~~ [(3)]	~~T 59~~	~~4.0~~	~~4.0~~	~~4.0~~	~~3.0~~	~~4.0~~	~~7.0~~	~~7.0~~	~~3.0~~	~~3.0~~	~~3.0~~
~~Residue by Distillation, %, min.~~	~~T 59~~	~~68~~	~~68~~	~~68~~	~~65~~ [(5)]	~~54~~	~~68~~	~~60~~	~~30~~	~~-~~	~~-~~
~~Residue by Distillation, % max.~~	~~T 59~~	~~-~~	~~-~~	~~-~~	~~-~~	~~62~~	~~-~~	~~65~~	~~-~~	~~-~~	~~-~~
~~Sieve Test, %, max.~~	~~T 59~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~	~~0.10~~
~~Penetrating Ability, mm, min.~~	~~902.02(w)~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~6~~	~~-~~	~~-~~
~~Stone Coating Test, %~~	~~902.02(t)3a~~	~~-~~	~~-~~	~~90~~	~~-~~	~~-~~	~~90~~	~~90~~	~~-~~	~~-~~	~~-~~
~~Settlement, %, max.~~	~~T 59~~	~~5~~	~~5~~	~~5~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Storage Stability, %, max.~~	~~T 59~~	~~-~~	~~-~~	~~-~~	~~1~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Asphalt Content by Distillation at 204°C, %, min.~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~54~~	~~45~~
~~Asphalt Content by Distillation at 204°C, %, max.~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~62~~	~~-~~
~~Tests on Residue~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~

Penetration (0.1 mm) at 25°C, 100g, 5 s, min. (4)	T 49	100	100	100	90	50	-	-	40 (7)	50	300+
Penetration (0.1 mm) at 25°C, 100g, 5 s, max. (4)	T 49	200	200	200	150	200	-	-	90 (7)	200	-
Penetration (0.1 mm) at 25°C, 50g, 5 s, min. (4)	T 49	-	-	-	-	-	100	100	-	-	-
Penetration (0.1 mm) at 25°C, 50g, 5 s, max. (4)	T 49	-	-	-	-	-	300	300	-	-	-
Ductility at 25°C, mm, min.	T 51	400	400	400	-	400	-	-	-	-	-
Solubility in Org. Sol., %, min.	T 44	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5
Float Test at 50°C, s, max. (4)	T 50	-	-	-	-	-	-	-	-	-	-
Float Test at 60°C, s, min. (4)	T 50	-	1200	1200	1200	1200	1200	1200	-	-	-
Force Ratio	T 300	-	-	-	0.3	-	-	-	-	-	-
Elastic Recovery, at 4°C	T 301	-	-	-	58	-	-	-	-	-	-
Polymer Content by Infrared	-	-	-	-	-	-	-	-	-	1.5+	1.5+

Notes: (1) Broken samples or samples more than 10 days old will not be tested.
(2) Combined percentage of the residue and oil distillate by distillation shall be at least 70% (note the different units – ml for oil and % for residue).
(3) Oil distillate shall be in accordance with ASTM D 396, table 1, grade no. 1
(4) The Engineer may waive the test.
(5) Maximum temperature to be held for 15 minutes 200 ± 5°C.
(6) Asphalt shall be polymerized prior to emulsification.
(7) The indicated penetration values shall apply to AE-PL used for fog seal (Section 412).

ACTION AND COMMENTS

400-R-553
412-R-549

Other sections containing specific cross references:

Motion: M
Second: M
Ayes:
Nays:

Action:

Passed as Submitted ____
Revised ____
Withdrawn ____

Recurring Special Provisions affected:

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Sheets affected:

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? ____

SPECIFICATION REVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current Specification refers to AASHTO M 268 for color specifications limits and reference standards for fluorescent reflective sheeting material, there are redundant tables in section 919 need to be removed.

PROPOSED SOLUTION: Propose to remove the redundant tables as shown in the attachment.

APPLICABLE STANDARD SPECIFICATIONS: SECTION 919

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

Submitted By: Todd Shields

Title: Manager, Office of Technical Services

Organization: INDOT, Highway Operations Division

Phone Number: (317) 233-4726

Date: 7/16/2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? INDOT Traffic Evaluation Oversight Committee

REVISION TO 2010 SPECIFICATIONS

SECTION 919.01, BEGIN LINE 81, DELETE AND INSERT AS FOLLOWS:

(b) Sheeting Material

Only sheeting materials from the Department's list of approved Sign Sheeting Materials shall be used. Sheeting materials will be placed and maintained on the Department's approved list in accordance with ITM ~~806, procedure G~~ *930*.

1. Reflective Sheeting

Reflective sheeting used for signs, channelizing and delineation devices shall be in accordance with AASHTO M 268. Type V reflective sheeting may be used on delineators. Reboundable reflective sheeting shall be used on plastic drums, flexible delineator posts, and other flexible channelizers.

~~The color chromaticity specifications limits, and the minimum reflective intensity values for fluorescent yellow, fluorescent yellow green, and fluorescent orange reflective sheeting materials shall be in accordance with the following tables.~~

~~COLOR SPECIFICATIONS LIMITS AND REFERENCE STANDARDS FOR FLUORESCNET REFLECTIVE SHEETING MATERIAL~~

	~~Chromaticity Coordinates~~							
	~~1~~		~~2~~		~~3~~		~~4~~	
	~~x~~	~~y~~	~~x~~	~~y~~	~~x~~	~~y~~	~~x~~	~~y~~
~~Fluorescent Orange~~	~~0.583~~	~~0.416~~	~~0.535~~	~~0.400~~	~~0.595~~	~~0.351~~	~~0.645~~	~~0.355~~
~~Fluorescent Yellow~~	~~0.479~~	~~0.520~~	~~0.446~~	~~0.483~~	~~0.512~~	~~0.421~~	~~0.557~~	~~0.442~~
~~Fluorescent Yellow/Green~~	~~0.387~~	~~0.610~~	~~0.369~~	~~0.546~~	~~0.428~~	~~0.496~~	~~0.460~~	~~0.540~~

~~DAYTIME LUMINANCE FACTORS FOR FLUORESCENT REFLECTIVE SHEETING MATERIAL~~

	~~Luminance Factor Limits (Y)~~		
	~~Min~~	~~Max~~	~~YF~~
~~Fluorescent Orange~~	~~25~~	~~None~~	~~15~~
~~Fluorescent Yellow~~	~~45~~	~~None~~	~~20~~
~~Fluorescent Yellow/Green~~	~~60~~	~~None~~	~~20~~

~~MINIMUM REFLECTIVE INTENSITY VALUES FOR FLUORESCENT REFLECTIVE SHEETING MATERIAL~~

~~Observation Angle~~	~~Entrance Angle~~	~~Fluorescent Orange~~	~~Fluorescent Yellow~~	~~Fluorescent Yellow/Green~~
~~0.2~~	~~-4.0~~	~~200~~	~~240~~	~~325~~
~~0.2~~	~~30.0~~	~~85~~	~~150~~	~~200~~
~~0.5~~	~~-4.0~~	~~80~~	~~165~~	~~175~~
~~0.5~~	~~30.0~~	~~32~~	~~75~~	~~70~~

The reflective sheeting shall include an adhesive backing Class 1 or Class 2 in accordance with AASHTO M 268.

ACTION AND COMMENTS

SECTION 919, CONTINUED.

Other sections containing specific cross references:

Motion: M
Second: M
Ayes:
Nays:

Action:

Passed as Submitted ____
Revised ____
Withdrawn ____

Recurring Special Provisions affected:

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Sheets affected:

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? ____