INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING

Driving Indiana's Economic Growth

APPROVED MINUTES

November 19, 2009 Standards Committee Meeting

MEMORANDUM

December 18, 2009

TO: Standards Committee

FROM: Jeff James, Acting Secretary

RE: Minutes for the November 19, 2009 Standards Committee Meeting

The Standards Committee meeting was called to order by the Chairman at 9:09 a.m. on November 19, 2009 in the N955 Bay Window Conference Room. The meeting adjourned at 10:43 a.m.

The following committee members were in attendance:

Mark Miller, Chairman	Dave Andrewski, Pvmt. Engineering
Greg Pankow, Constr. Mgmt.	Bob Cales, Contract Admin.
Ron Heustis, Constr. Mgmt.	John Wright, Roadway Services
Todd Shields, Highway Ops.	Tony Uremovich*, Structural Services
Ron Walker, Materials Mgmt.	Jim Keefer, Ft. Wayne Dist.
Tom Caplinger, Crawfordsville Dist.	

* Proxy for Anne Rearick

Also in attendance were the following:

Jeff James, Acting Secretary	Steve Fisher, BITS
Joe Rogers, ADS	Brian Crume, E&B Paving
Greg Broz, Constr. Mgmt.	Bren George, FHWA
Lana Podorvanova, Const. Mgmt.	Eric Carleton, Ind. Conc. Pipe
Eric Wathen, Rinker Materials	Brad Cruea, Milestone
Jim Reilman, Constr. Mgmt.	Dan Brown, Pfend & Brown
Mike Byers, IN-ACPA	Joey Franzino, Geotech Engineering

The following agenda items were listed for consideration.

Page No.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items considered)

NEW BUSINESS

1. Approval of the October 15, 2009 Minutes

ACTION: Approved as Revised

Motion: Mr. Andrewski
Second: Mr. Cales
Ayes: 10
Nays: 0

DISCUSSION: Mr. Caplinger indicated that the sump shown on the Recurring Plan Detail 723-R-569d (Sheet 4of 7) is not correctly depicted. The sump needs to be shown to be above the top of the footing. Mr. Uremovich indicated that the error would be corrected. Mr. Caplinger also noted that the proposed Design Manual language on P. 16 of the minutes is unclear and needs to be clarified. Mr. Uremovich indicated that he will make the required clarifications. Mr. Heustis indicated that development of the recurring special provision for this item will be delayed until related changes to Standard Specification Sections 714 and 715 are approved.

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items considered)

NEW BUSINESS

(No items considered)

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

OLD BUSINESS

Item No. 02 10/15/09 (2010 SS) Standard Drawing: 701-BPIL-04	Ms. Rearick SPLICING PIPE PILES IN FIELD	4

ACTION: Passed as Submitted

NEW BUSINESS

Item No. 01 11/19/09 (2010 SS) 715-X-XXX	Mr. Walker *MANDREL TESTING OF THERMOPLASTIC PIPES*	8

ACTION: Withdrawn

Item No. 02 11/19/09 (2010 SS) SECTION 401.18 SECTION 401.19	Mr. Heustis Pavement Smoothness Pay Factors	12

ACTION: Withdrawn

Item No. 03 11/19/09 (2010 SS) SECTION 501.25 SECTION 501.28	Mr. Heustis Pavement Smoothness Pay Factors	20
ACTION:	Withdrawn	
Item No. 04 11/19/09 (2010 SS) SECTION 802.12 SECTION 919.01	Mr. Shields Basis of Payment Traffic Signs	26
ACTION:	Passed as Revised	

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

Ms. Rearick
Date: 11/19/09

SPECIFICATION REVISIONS

REVISION TO THE STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The weld detail information on standard drawing 701-BPIL-04 is not clear. It is widely reported that the beveled edge is not being placed on the piling, nor is the gap being provided prior to welding. The lack of a beveled edge or gap between the piles may be a cause of recent welded splice failures.

PROPOSED SOLUTION: Add a "blown up" detail of the weld area showing the beveled edge on the upper pipe pile and the space that is supposed to be between the piles being spliced. Incorporating this detail on the Standard Drawing will help clarify the weld detail to the PE/S since very few individuals have knowledge of or access to the AWS Bridge Welding Code to know what the B-U4a weld symbol shown on the current drawing indicates or requires.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: 701-BPIL-04 & E701-BPIL-04

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Anne Rearick

Title: Manager, Office of Structural Services

Organization: INDOT

Phone Number: 2-5152

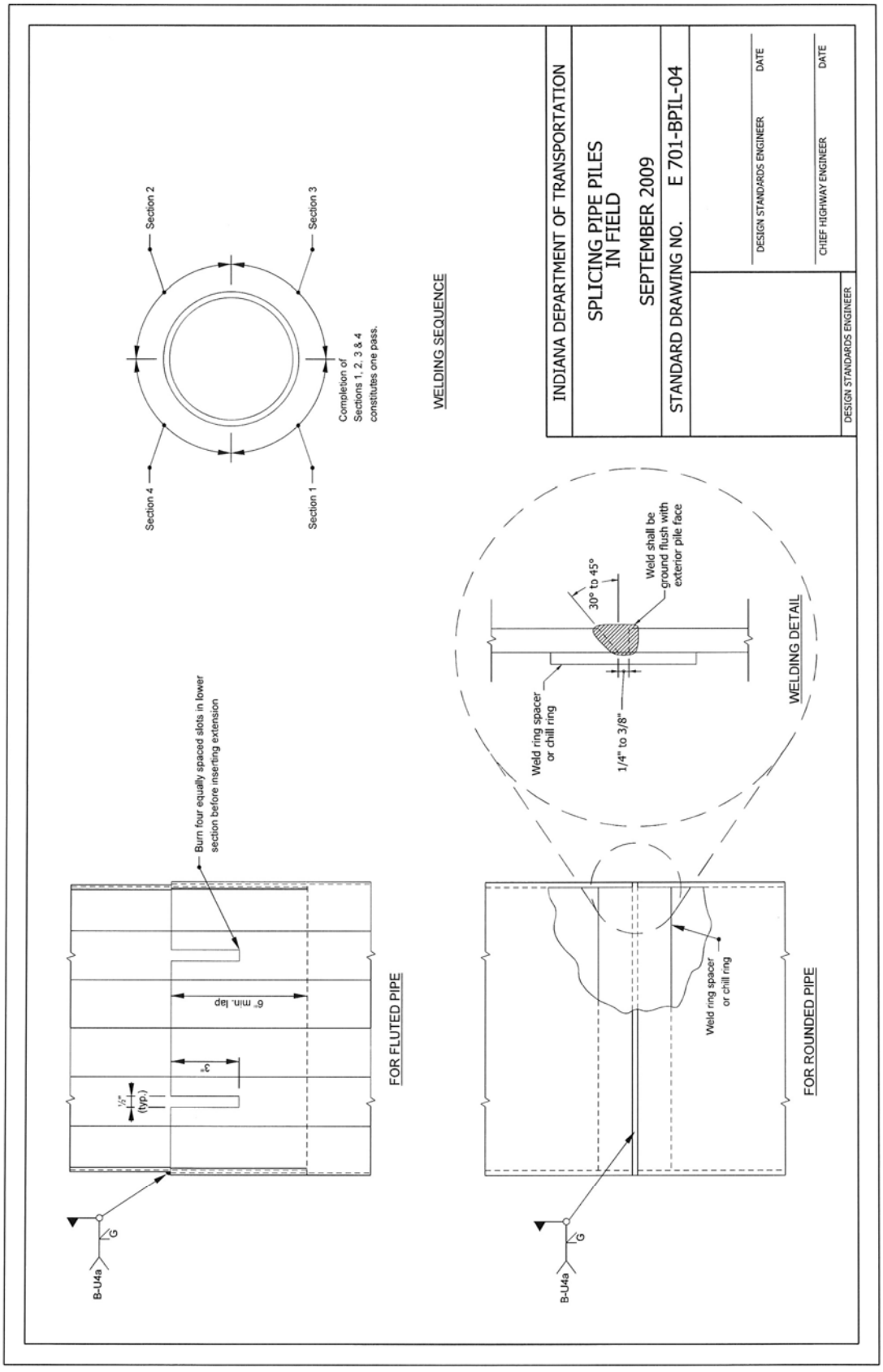
Date: September 21, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? Adding this additional information to the current standard drawing was discussed between Anne Rearick, Jim Reilman, Tony Uremovich and Mir Zaheer.

Item No. 02 10/15/09 (2010 SS)
Ms. Rearick
Date: 11/19/09

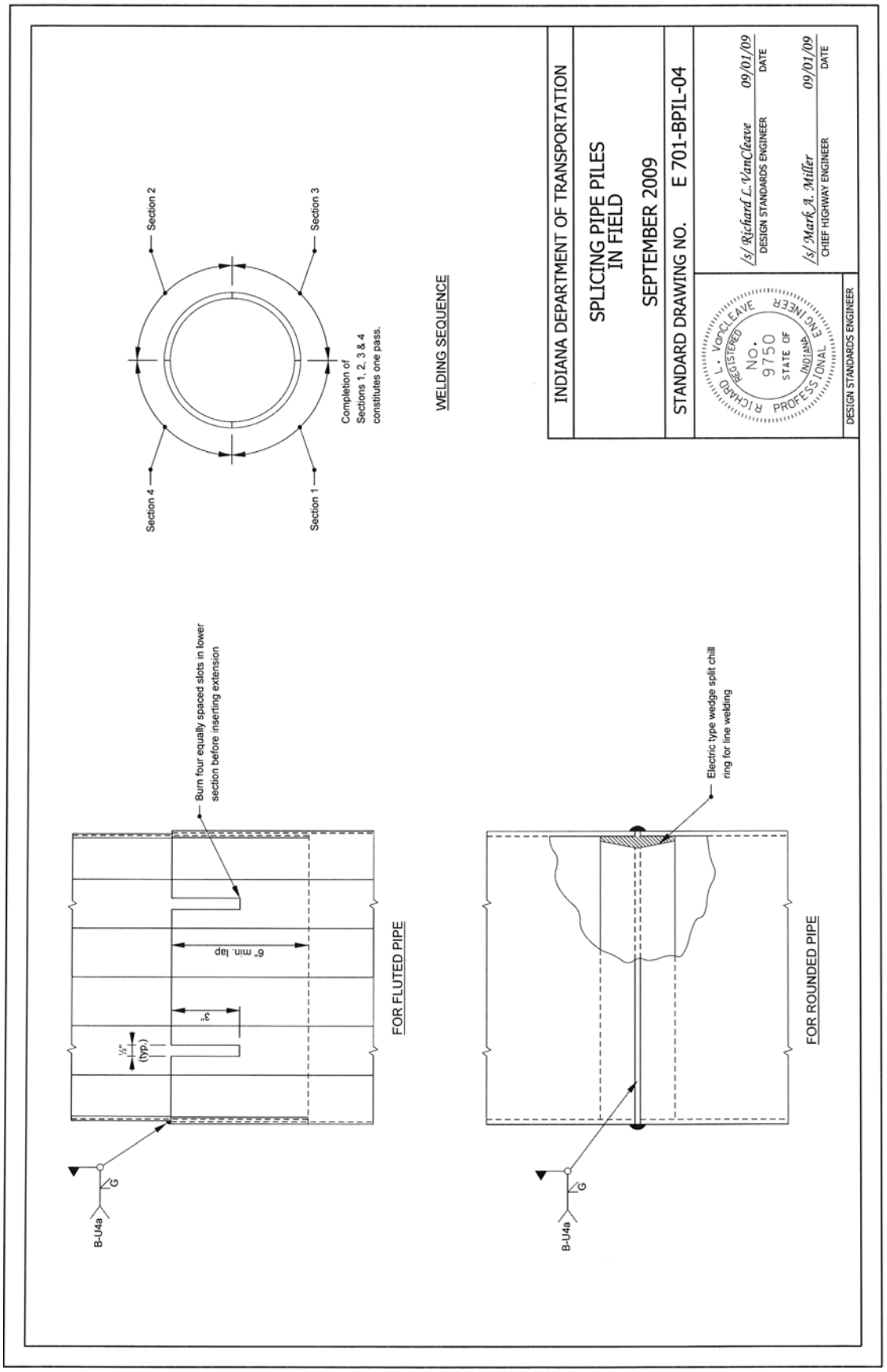
REVISION TO THE STANDARD DRAWINGS

701-BPIL-04 SPLICING PIPE PILES IN FIELD
(PROPOSED STANDARD DRAWING REVISION)



REVISION TO THE STANDARD DRAWINGS

BACKUP NO. 1: 701-BPIL-04 SPLICING PIPE PILES IN FIELD
(EXISTING STANDARD DRAWING)



Item No. 02 10/15/09 (2010 SS)
Ms. Rearick
Date: 11/19/09

COMMENTS AND ACTION

701-BPIL-04 SPLICING PIPE PILES IN FIELD

Motion: Mr. Uremovich Second: Mr. Keefer Ayes: 10 Nays: 0	Action: __X__ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Other sections containing specific cross references: None	___20__ Standard Specifications Book ___ Create RSP (No._____) Effective _____Letting RSP Sunset Date: _____
Recurring Special Provision affected: None	____ Revise RSP (No._____) Effective _____Letting RSP Sunset Date: _____
Standard Sheets affected: 701-BPIL-04 E701-BPIL-04	Standard Drawing Effective Sep.01,2010 ___ Create RPD (No. _____) Effective _____Letting ____ Technical Advisory
GIFE Sections affected: None	GIFE Update Req'd.? Y _____ N _X_ By _____ Addition or _____ Revision Frequency Manual Update Req'd?Y___N _X_ By _____ Addition or _____ Revision Received FHWA Approval? _X_

Mr. Walker
Date: 11/19/09

SPECIFICATION REVISIONS

REVISION TO THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Mandrel testing of thermoplastic pipes may not be being performed in accordance with the 715.09 specifications. Also the mandrel testing requirements in the specifications are not in accordance with AASHTO.

PROPOSED SOLUTION: Modify the current 715.09 specification to more clearly identify the pipes that must be mandrel tested and the allowable deflections. Also make the specification in substantial compliance with AASHTO.

APPLICABLE STANDARD SPECIFICATIONS: 715.09; 715.13; 715.14; 907.22

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: 715

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Ron Walker

Title: Manager, Office of Materials Management

Organization: INDOT

Phone Number: 610-7251

Date: 10/16/09

APPLICABLE SUB-COMMITTEE ENDORSEMENT? INDOT Pipe Committee

Item No. 01 11/19/09 (2010 SS)
Mr. Walker
Date: 11/19/09

REVISION TO THE STANDARD SPECIFICATIONS

715-X-XXX MANDREL TESTING OF THERMOPLASTIC PIPES
(PROPOSED NEW RECURRING SPECIAL PROVISION)

715-x-xxx MANDREL TESTING OF THERMOPLASTIC PIPES

(Adopted xx-xx-xx)

The Standard Specifications are revised as follows:

SECTION 715, BEGIN LINE 315 DELETE AND INSERT AS FOLLOWS:

All pipes, except underdrains, will be visually inspected for acceptance a minimum of 30 days after the completion of backfill operations. Pipes that cannot be visually inspected shall be video inspected for acceptance in accordance with 718.07. The Engineer will determine the sections of pipe to be video inspected. *A copy of the video inspection shall be provided in a format acceptable to the Engineer prior to performing the mandrel testing.*

After the visual or video inspection, *the Contractor shall check pipe deflection by performing a mandrel test for* all ~~polyethylene and smooth wall polyvinyl chloride~~ *thermoplastic* pipes ~~36 in. (900 mm) or less in pipe pay item diameter~~ *in accordance with AASHTO M 294, M 278, M 304, or ASTM F 714, F 894, F 679, or F 794* ~~shall be mandrel tested.~~ *Mandrel testing will not be required for thermoplastic pipe in accordance with ASTM F 949.* The mandrel shall ~~be a go/no go mandrel with~~ *have* a minimum of nine arms or prongs and a diameter ~~of~~ *that is 95%* ~~less than~~ *of* the pipe pay item diameter. *The Contractor shall provide a proving ring that is 95% of the pipe pay item diameter for each mandrel.*

The Contractor shall pull the mandrel through the pipe by hand. If the mandrel does not pass through the pipe ~~when pulled by hand~~ *the Contractor shall provide for a professional engineer to evaluate the pipe.* ~~or the mandrel damages the pipe, the deficient pipe shall be removed, replaced, and mandrel tested a minimum of 30 days after the backfill has been replaced.~~ *The evaluation shall consider the severity of the deflection and its effects on structural integrity, environmental conditions, and the design service life of the pipe. A report summarizing the evaluation and including the professional engineer's recommendation for acceptance or replacement of the pipe shall be submitted to the Engineer for final determination.*

If the professional engineer's report recommends replacement of the pipe or if the deflection of the pipe is greater than 7.5% of the pipe pay item diameter or if the mandrel has damaged the pipe, the pipe shall be replaced. Deficient pipe shall at a minimum be replaced between the nearest acceptable pipe joints or to the nearest structure. Replacement pipe sections shall be mandrel tested a minimum of 30 days after the completion of backfill operations.

SECTION 715, BEGIN LINE 455 DELETE AS FOLLOWS:

Video inspection for pipe will be measured by the linear foot (meter) as determined by the electronic equipment.

REVISION TO THE STANDARD SPECIFICATIONS

715-X-XXX MANDREL TESTING OF THERMOPLASTIC PIPES
(PROPOSED NEW RECURRING SPECIAL PROVISION) (CONTINUED)

~~Mandrel testing of polyethylene and smooth wall polyvinyl chloride pipes 36 in. (900 mm) or less in pipe pay item diameter will not be measured for payment.~~

SECTION 715, BEGIN LINE 649, DELETE AND INSERT AS FOLLOWS:

The cost of providing the video inspection equipment, technician, ~~videotapes, or computer disks~~ *and the copy of the video inspection* shall be included in the cost of ~~the~~ video inspection for pipe.

No additional payment will be made for repair or ~~removal~~ *replacement* of pipes, backfill, ~~the~~ video ~~re-~~inspection of the repair*sed* or replaced pipe, and all other work associated with the repair or ~~removal~~ *replacement* of unaccept~~ed~~*able* pipes.

The cost of mandrel testing shall be included in the cost of the pipe pay item.

SECTION 907, BEGIN LINE 217, INSERT AS FOLLOWS:

907.22 Profile Wall Polyvinyl Chloride Pipe

Pipe and fittings shall be in accordance with AASHTO M 304 *or ASTM F 949* for nominal diameters of 36 in. (900 mm) or less. Perforations shall be required when used as a longitudinal underdrain or end bent drain pipe. Qualification requirements for the manufacturers shall be in accordance with 907.16.

COMMENTS AND ACTION

715-X-XXX MANDREL TESTING OF THERMOPLASTIC PIPES
(PROPOSED NEW RECURRING SPECIAL PROVISION)

DISCUSSION: Mr. Keefer is unclear regarding whether Profile Wall PVC pipe requires mandrel testing under the current proposal. Mr. Heustis indicated that this proposal excludes Profile Wall PVC that meets ASTM F 949 requirements from the mandrel testing requirements. Mr. Keefer also questioned the discrepancy between the 5% go/no go mandrel and the 7.5% deflection referenced later in the proposal. Mr. Heustis indicated that clarification of this language will be addressed in the resubmittal. Mr. Rogers commented on the rationale discussed for the exclusion of ASTM F 949 pipes from mandrel testing is not appropriate. He requests that mandrel testing be required for ASTM F 949 pipes as well. Mr. Miller discussed the evolution of the thermoplastic pipe specifications and that the ultimate goal will be to reduce the amount of mandrel testing performed. Mr. Carleton commented that the backfill is a very important factor in the performance of a thermoplastic pipe and that deflection testing should be performed on all thermoplastic pipe materials.

Note: Plan to reintroduce at December 17, 2009 meeting w/other related changes.

Motion: Second: Ayes: Nays:	Action: _____ Passed as Submitted _____ Passed as Revised __X__ Withdrawn
Standard Specifications Sections affected: None	_____ 20__ Standard Specifications Book
Recurring Special Provision affected: None	_____ Create RSP (No._____) Effective _____Letting RSP Sunset Date: _____ _____ Revise RSP (No._____) Effective _____Letting RSP Sunset Date: _____
Standard Sheets affected: None	Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____Letting _____ Technical Advisory
GIFE Sections affected: Section 4.11.2	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. Heustis
Date: 11/19/09

SPECIFICATION REVISIONS

REVISION TO THE STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: 401.18 includes language which appears to give the Contractor the ability to designate the method to measure pavement smoothness in situations where the posted speed limit is 45 mph or less. The Department should determine the level of smoothness desired for its pavements. Also, for budgetary reasons, the Department needs to be able to determine on which contracts the Contractor will have the opportunity to earn a smoothness bonus. In addition, some District Construction personnel have indicated that there has been some confusion regarding who is responsible for performing of the straightedge operation.

PROPOSED SOLUTION: Attached revised specifications. If passed by the Standards Committee, these proposed changes can be incorporated into RSP 400-R-553. In addition, if passed by the Standards Committee, proposed revisions to ITM 912 will be forwarded to the ITM Committee for consideration.

APPLICABLE STANDARD SPECIFICATIONS: 401.18, 401.19 (c)

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: Chapter 52

APPLICABLE SECTION OF GIFE: Section 13

APPLICABLE RECURRING SPECIAL PROVISIONS: 400-R-553

Submitted By: Jeff James

Title: Field Engineer

Organization: INDOT

Phone Number: 317/232-5082

Date: October 21, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? The proposed revisions were initially discussed at an INDOT/APAI Committee meeting. Additional comments were provided by INDOT Division of Construction Management and District Construction personnel.

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 405, DELETE AND INSERT AS FOLLOWS:

401.18 Pavement Smoothness

~~The p~~*P*avement smoothness will be accepted by means of a profilograph, a 16 ft (4.9 m) long straightedge, or a 10 ft (3 m) long straightedge *as described below*.

(a) Profilograph

When a pay item for Profilograph, HMA is included in the contract, the Contractor shall furnish, calibrate, and operate an approved profilograph in accordance with ITM 912 on the mainline traveled way and ramps, including adjacent acceleration or deceleration lane, where all of the following conditions are met:

~~The profilograph shall be used where all of the following conditions are met:~~

~~(a)~~*1.* ~~t~~*T*he design speed is greater than 45 mph (70 km/h).

~~(b)~~*2.* ~~t~~*T*he ~~pavement~~ lanes are ~~full~~ *constant* width and *the length of the lane is* 0.1 mi (0.16 km) or longer~~, and~~.

~~(c)~~*3.* ~~t~~*T*he HMA is placed on a milled surface or the total combined planned lay rate of surface, intermediate, and base *mixtures* is 385 lb/syd (210 kg/m^2) or greater.

~~If a pay item, Profilograph, HMA, is included in the contract and the above conditions are met, the Contractor shall furnish, calibrate, and operate an approved profilograph in accordance with ITM 912.~~ The profilogram produced shall become the property of the Department. The profilograph shall remain the property of the Contractor. ~~When a profilograph, HMA, is not included as a pay item, and the above conditions are met, the Department will furnish, calibrate, and operate the profilograph or the Department will develop a change order in accordance with 109.05 to include profilograph, HMA as a pay item.~~

~~Within the limits of a smoothness section where the posted speed is 45 mph (70 km/h) or less, smoothness of that section may be measured by a profilograph or a 16 ft (4.9 m) long straightedge. The Contractor shall notify the Engineer of the selected process prior to placement of the HMA. Smoothness pay adjustments are only applicable when measured by a profilograph.~~

If a smoothness section as defined by 401.19(c) includes segments with posted speed limits greater than 45 mph (70 km/h) as well as segments with posted speed limits less than or equal to 45 mph (70 km/h), the Contractor may elect to extend the profilograph operation for smoothness acceptance to include slower speed limit areas. If the Contractor makes such an election, the Engineer must be notified in writing prior to

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS (CONTINUED)

commencement of the paving operation in the smoothness section. Otherwise, the smoothness section will be terminated at the location of the change in posted speed limit in accordance with ITM 912 and the longitudinal smoothness in the segment with a posted speed limit less than or equal to 45 mph (70 km/h) will be accepted by operation of a 16 ft (4.9 m) straightedge.

At locations where the profilograph is required, it shall be used on surface and dense graded intermediate mixtures. Corrections shall be made in accordance with 401.18(c).

(b) 16 ft (4.9 m) Straightedge and 10 ft (3 m) Straightedge

The Department will furnish and operate 16 ft (4.9 m) and 10 ft (3 m) straightedges as described below. The 16 ft (4.9 m) straightedge is used to accept smoothness longitudinally along the mainline and the 10 ft (3.0 m) straightedge is used to accept smoothness transverse to the direction of mainline traffic. This also includes longitudinal smoothness on public road approaches and crossovers. The Contractor shall provide all traffic control required for the operation of straightedges.

For contracts which include the Profilograph, HMA pay item, the 16 ft (4.9 m) long straightedge will be used to accept longitudinal smoothness on all dense graded mixtures at the following locations:

1) *All constant width pavement lanes shorter than 0.1 mi (0.16 km).*
2) *All tapers.*
3) *All turn lanes, including bi-directional left turn lanes.*
4) *All ramps with design speeds of 45 mph (70 km/h) or less.*
5) *All acceleration and deceleration lanes associated with ramps with design speeds of 45 mph (70 km/h) or less.*
6) *All shoulders.*
7) *All mainline traveled way lanes at locations exempted from profilograph operation by ITM 912.*

In addition, the 16 ft (4.9 m) straightedge will be used to accept longitudinal smoothness on all base mixtures at locations where the profilograph use is required on overlying mixtures.

For contracts where the profilograph is not used for smoothness acceptance, the 16 ft (4.9 m) straightedge will be used to accept longitudinal smoothness on all dense graded mixtures at the above locations and on all mainline traveled way lanes.

~~The 16 ft (4.9 m) long straightedge is used to check longitudinal profile and shall be used on all overlays where the profilograph is not specified. For contracts that include a profilograph item, the 16 ft (4.9 m) long straightedge shall be used on shoulders, on all full width pavement lanes shorter than 0.1 mi (0.16 km), in length, on tapers, within 50 ft~~

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS (CONTINUED)

~~(15 m) of a reinforced concrete bridge approach, and within 50 ft (15 m) of an existing pavement, which is being joined.~~

For all contracts, a 10 ft (3 m) straightedge will be used for smoothness acceptance for all dense graded mixtures used for all traveled way lanes, shoulders, turn lanes, tapers, ramps, acceleration lanes, and deceleration lanes measured transverse to the mainline. The 10 ft (3 m) straightedge will also be utilized for acceptance of smoothness of all dense graded mixtures measured longitudinally for public road approaches and crossovers.

~~The 10 ft (3 m) long straightedge shall be used to check transverse slopes, across travel lanes and shoulders, approaches, and crossovers.~~

(c) Smoothness Correction

All wavelike irregularities and abrupt changes in profile caused by paving operations shall be corrected.

~~Each finished course of base and intermediate shall be subject to approval. The pavement smoothness shall be checked on any new intermediate course located immediately below a surface course and the surface course at the locations as designated in ITM 912.~~

If grinding of ~~the~~ *an* intermediate ~~course~~ *mixture* is used for pavement smoothness corrections, the grinding shall not precede the surface placement by more than 30 calendar days if open to traffic.

When the 16 ft (4.9 m) straightedge is used ~~on a surface course~~, the pavement variations shall be corrected to 1/4 in. (6 mm) or less. When the 10 ft (3 m) straightedge is used, the pavement variations shall be corrected to 1/8 in. (3 mm) or less.

When the profilograph is being used on a surface course, in addition to the requirements for the profile index, all areas having a high or low point deviation in excess of 0.3 in. (8 mm) shall be corrected. ~~Courses~~ ~~u~~*U*nderlying *mixtures* ~~the surface courses~~ that are exposed by corrective actions shall be milled to *a depth of* 1 1/2 in (38 mm) and replaced with ~~the same type~~ surface ~~materials~~ *mixture*. The initial profile index shall be determined prior to any corrective action. The final profile index for each section requiring corrective action will be determined after all corrective action within that section has been completed.

When the profilograph is being used on an intermediate course, all areas having a high or low point deviation in excess of 0.3 in. (8 mm) shall be corrected. After corrective action is taken on an intermediate course, a 16 ft (4.9 m) straightedge may be used to verify the adequacy of the corrective action. ~~When the 16 ft (4.9 mm) or 10 ft (3~~

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS (CONTINUED)

~~m) straightedge is being used on an intermediate course, all areas having a high or low point deviation in excess of 1/4 in. (6 mm) shall be corrected.~~

SECTION 401, BEGIN LINE 578, DELETE AND INSERT AS FOLLOWS:

(c) Smoothness

Smoothness pay adjustments will only be applied when the traveled way smoothness is measured by a profilograph.

~~When the pavement smoothness is tested with a profilograph, payment will be based on a zero blanking band on the final profile index in accordance with the following table. A Quality Assurance Pay Factor, PFs, for smoothness will apply to the planned typical section including the aggregate base, and the HMA base, intermediate, and surface courses. The quality assurance adjustment for each section will include the total area of each pavement lane excluding shoulders for 0.1 mi (0.16 km) long section represented by the profile index calculated by the following formula.~~

At locations where a profilograph is used to accept smoothness, a quality assurance adjustment will be determined for each 0.1 mi (0.16 km) section of the lane. This adjustment will be applied to all QC/QA HMA pay items within the pavement section. The adjustment for each section will be calculated using the following formula.

$$q_s = (PF_s - 1.00) \sum_{i=1}^{n} \left(A \times \frac{S}{T} \times U \right)$$

where:

q_s = quality assurance adjustment for smoothness for one section
PF_s = pay factor for smoothness
n = number of layers
A = area of the section, syd (m^2)
S = planned spread rate for material, lb/syd (kg/m^2)
T = conversion factor: 2000 lb/ton (1000 kg/Mg)
U = unit price for the material, $/ton ($/Mg)

For smoothness sections that are less than 0.1 mi (0.16 km) in length or require profilograph operation along both lane edges, the profile index used to obtain the smoothness pay factor used in the above formula will be determined in accordance with ITM 912.

The quality assurance adjustment for smoothness, Qs, for the contract will be the total of the quality assurance adjustments for smoothness, qs, on each section by the following formula.

$$Q_s = \sum q_s$$

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS (CONTINUED)

ADJUSTMENT FOR SMOOTHNESS ($PI_{0.0}$) ZERO BLANKING BAND	
Design Speed Greater Than 45 mph (70 km/hr)	
Profile Index in./0.1 mi. (mm per 0.16 km)	Pay Factor
Over 0.00 to 1.20 in. (Over 0 to 30 mm)	1.06
Over 1.20 to 1.40 in. (Over 30 to 35 mm)	1.05
Over 1.40 to 1.60 in. (Over 35 to 40 mm)	1.04
Over 1.60 to 1.80 in. (Over 40 to 45 mm)	1.03
Over 1.80 to 2.00 in. (Over 45 to 50 mm)	1.02
Over 2.00 to 2.40 in. (Over 50 to 60 mm)	1.01
Over 2.40 to 3.20 in. (Over 60 to 80 mm)	1.00
Over 3.20 to 3.40 in. (Over 80 to 85 mm)	0.96
All pavement with a profile index ($PI_{0.0}$) greater than 3.40 in. (85 mm) shall be corrected to 3.40 in. (85 mm).	

Quality assurance pay factors greater than 1.00 will be applicable only to the initial measured profile index, prior to any corrective work. Regardless of the pay factor tabulated above, quality assurance pay factors for individual sections that require corrective action for high or low points in excess of 0.3 in. (8 mm) will not be greater than 1.00. Quality assurance pay factors of 1.00 or less will be applied to pavement sections where corrective work has been completed.

The total quality assurance adjustments is to be calculated as follows:

$$Q = Q_s + (\sum q)$$

where:

Q = total quality assurance adjustment
Q_s = quality assurance adjustment for smoothness
q = lot or sublot quality assurance adjustment

COMMENTS AND ACTION

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS

DISCUSSION: Mr. Miller discussed the rationale for the proposal. He indicated that the Department values pavement which is initially smooth. He also noted that budgetary concerns are a factor that affects this issue. He also commented that the definition of "initially smooth pavements" appears to vary between industry and INDOT and cited mill and fill contracts as an example of situations where pavements do not retain smoothness for long. Mr. Andrewski suggested that a cost/benefit analysis should be performed to determine whether INDOT is getting sufficient benefit from smoothness bonus payments. Mr. Walker commented on the history that generated the concept of the smoothness bonus. He also indicated that it may be appropriate to measure the improvement of smoothness of the constructed pavement compared to the original pavement on resurface contracts. Mr. Keefer noted that it is his personal opinion that Contractors always attempt to build a smooth pavement and questioned whether smoothness bonuses are beneficial to the Department. He also noted that it may be time to tighten the requirements if bonuses are being earned on a high percentage of contracts. Mr. Keefer also noted that the current proposal appears to rely on the presence of the profilograph pay item. Mr. Keefer and Mr. Andrewski agreed that the designer should determine whether the profilograph pay item should be included in the contract. Mr. Keefer also noted that he likes the requirement for Contractors to provide traffic control for the straightedge and questions the use of the word mixture throughout the proposal. Mr. Walker requested that the reintroduced proposal address locations where the profilograph is not required. Mr. Heustis suggested that ITM 912 be attached as background information for the resubmittal. Mr. Brown noted that industry has a problem with the requirements for the profilograph pay item to be included in the contract to be considered for a bonus, providing traffic control for the straightedge operation because it is difficult to bid an element that is to be performed by the Department, the apparent omission of SMA pavements for consideration of bonus payment, and INDOT's lack of accounting for bonuses in contract budgets. Mr. Heustis commented that SMA pavements are considered for bonus payments because it is paid for with a QC/QA HMA pay item. Mr. Brown also indicated that industry is concerned regarding designers determining whether the profilograph pay item is to be put into contracts. Mr. Crume indicated that the absence of the pay item during this period of time of high work volume is troublesome because pre-bid questions don't always get asked and answers are not always provided. Mr. Heustis proposed that the Office of Pavement Engineering determine whether the profilograph pay item should be included in contracts.

COMMENTS AND ACTION (CONTINUED)

REVISION TO SECTION 401.18 PAVEMENT SMOOTHNESS
REVISION TO SECTION 401.19 PAY FACTORS

Note: Plan on reintroducing at December 17, 2009 meeting.

Motion: Second: Ayes: Nays:	Action: _____ Passed as Submitted _____ Passed as Revised __X__ Withdrawn
Standard Specifications Sections affected: 109.05.1 p108; 402.18 p258; 410.18 p283; 410.19 p284.	_____ 20__ Standard Specifications Book _____ Create RSP (No._____) Effective _____Letting RSP Sunset Date: _____
Recurring Special Provision affected: 400-C-553; 411-R-432.	_____ Revise RSP (No._____) Effective _____Letting RSP Sunset Date: _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____Letting
Standard Sheets affected: None	_____ Technical Advisory
GIFE Sections affected: Section 13	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

REVISION TO THE STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Revisions to smoothness measurement requirements have been proposed to Section 401 for HMA pavements in order to enable the Department to determine which contracts will require the profilograph and which ones will utilize a 16 ft straightedge to verify longitudinal pavement smoothness. In order to maintain consistent requirements for all pavement types, similar revisions are proposed to 501.

PROPOSED SOLUTION: Attached revised specifications. If passed by the Standards Committee, these proposed changes can be incorporated into RSP 501-R-540. In addition, if passed by the Standards Committee, proposed revisions to ITM 912 will be forwarded to the ITM Committee for consideration.

APPLICABLE STANDARD SPECIFICATIONS: 501.25, 501.28 (d)

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: Chapter 52

APPLICABLE SECTION OF GIFE: Section 8

APPLICABLE RECURRING SPECIAL PROVISIONS: 501-R-540

Submitted By: Jeff James

Title: Field Engineer

Organization: INDOT

Phone Number: 317/232-5082

Date: October 21, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? None. INDOT Division of Construction Management and District Construction personnel have reviewed these proposed revisions as well as the companion revisions to 401 for HMA pavements.

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO THE SECTION 501.25 PAVEMENT SMOOTHNESS
REVISION TO THE SECTION 501.28 PAY FACTORS

The Standard Specifications are revised as follows:

SECTION 501, BEGIN LINE 368, DELETE AND INSERT AS FOLLOWS:

501.25 Pavement Smoothness

~~The p~~*P*avement smoothness will be accepted by means of a profilograph, a 16 ft (4.9 m) long straightedge, or a 10 ft (3 m) long straightedge *as described below*.

(a) Profilograph

When a pay item for Profilograph, PCCP is included in the contract, the Contractor shall furnish, calibrate, and operate an approved profilograph in accordance with ITM 912 for the acceptance of longitudinal smoothness on the mainline traveled way and ramps, including adjacent acceleration or deceleration lane, where all of the following conditions are met:

~~The profilograph shall be used where all of the following conditions are met:~~

~~(a)~~*1.* ~~t~~*T*he design speed is greater than 45 mph (70 km/h)~~, and~~.

~~(b)~~*2.* ~~t~~*T*he ~~pavement~~ lanes ~~excluding shoulders~~ are ~~full~~ *constant* width and 0.1 mi (0.16 km) or longer.

~~If a pay item, profilograph, PCCP, is included in the contract, and the above conditions are met, the Contractor shall furnish, calibrate, and operate an approved profilograph in accordance with ITM 912.~~ The profilogram produced shall become the property of the Department. The profilograph shall remain the property of the Contractor. ~~When a profilograph, PCCP is not included as a pay item, and the above conditions are met, the Department will furnish, calibrate, and operate the profilograph or the Department will develop a change order in accordance with 109.05 to include profilograph, PCCP as a pay item.~~

If a smoothness section as defined by 501.28(d) includes segments with posted speed limits greater than 45 mph (70 km/h) as well as segments with posted speed limits less than or equal to 45 mph (70 km/h), the Contractor may elect to extend the profilograph operation for smoothness acceptance to include slower speed limit areas. If the Contractor makes such an election, the Engineer must be notified in writing prior to commencement of the paving operation in that smoothness section. Otherwise, the smoothness section will be terminated at the location of the change in posted speed limit in accordance with ITM 912 and the longitudinal smoothness in the segment with a posted speed limit less than or equal to 45 mph (70 km/h) will be accepted by operation of a 16 ft (4.9 m) straightedge.

(b) 16 ft (4.9 m) Straightedge and 10 ft (3 m) Straightedge

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO THE SECTION 501.25 PAVEMENT SMOOTHNESS
REVISION TO THE SECTION 501.28 PAY FACTORS (CONTINUED)

The Department will furnish and operate 16 ft (4.9 m) and 10 ft (3 m) straightedges as described below. The Contractor shall provide all traffic control required for the operation of straightedges.

~~The 16 ft (4.9 m) long straightedge shall be used on all full-width pavement lanes shorter than 0.1 mi (0.16 km), on tapers, within 50 ft (15 m) of a reinforced concrete bridge approach, and within 50 ft (15 m) of an existing pavement which is being joined, and shoulders greater than 10 ft (3 m) wide.~~

For contracts which include the profilograph, PCCP pay item, the 16 ft (4.9 m) long straightedge will be used to accept longitudinal smoothness at the following locations:

1) *All constant width pavement lanes shorter than 0.1 mi (0.16 km).*
2) *All tapers.*
3) *All turn lanes, including bi-directional left turn lanes.*
4) *All ramps with design speeds of 45 mph (70 km/h) or less.*
5) *All acceleration and deceleration lanes associated with ramps with design speeds of 45 mph (70 km/h) or less.*
6) *All shoulders.*
7) *All mainline traveled way lanes at locations exempted from profilograph operation by ITM 912.*

For contracts where the profilograph is not used for smoothness acceptance, the 16 ft (4.9 m) straightedge will be used to accept longitudinal smoothness at the above locations and on all mainline traveled way lanes.

~~The~~ *For all contracts, the* 10 ft (3 m) long straightedge ~~shall~~ *will* be used ~~for transverse slopes, approaches, and crossovers.~~ *to accept smoothness for all slopes transverse to the mainline. This includes longitudinal profile for public road approaches and crossovers.*

As soon as the PCCP has cured sufficiently, the smoothness may be checked. Profile testing shall be completed prior to opening the pavement to traffic. The Department may direct that the pavement profile be evaluated within 24 h following placement. When profile testing is consistently outside pavement surface tolerances the paving operation shall be discontinued until an amended QCP is submitted. An initial profile index will be determined from the profilogram of this profile. The initial profile index for areas requiring replacement will be adjusted to include the results of a profilogram of all replaced areas.

Pavement smoothness variations outside specified tolerances shall be corrected by grinding with a groove type cutter or by replacement. Grinding will not be permitted until the PCCP is 10 days old or the flexural strength test is 550 psi (3800 kPa) or greater. The

grinding of the pavement to correct the profile shall be accomplished in either the longitudinal or the transverse direction. The PCCP texture after grinding shall be uniform. If the grinding operation reduces the tining grooves to a depth of less than 1/16 in. (1.5 mm) and the longitudinal length of the removal area exceeds 15 ft (4.5 m), or two or more areas are within 30 ft (9.0 m) of each other, the PCCP shall be re-textured in accordance with 504.03.

When the 16 ft (4.9 m) straightedge is used, the pavement variations shall be corrected to 1/4 in. (6 mm) or less. When the 10 ft (3 m) straightedge is used, the pavement variations shall be corrected to 1/8 in. (3 mm) or less.

When the profilograph is used, the pavement variations shall be corrected in accordance with 501.28(d). In addition to the requirements for the profile index, all areas having a high or low points deviation in excess of 0.3 in. (8 mm) shall be corrected. Verifying profilograph measurements will be taken only in the 0.1 mi (0.16 km) length where corrections have been performed.

SECTION 501, BEGIN LINE 562, DELETE AND INSERT AS FOLLOWS:

(d) Smoothness

When the pavement smoothness is tested with a profilograph, pavement will be based on a zero blanking band on the final profile index after corrective action. A Quality Assurance Pay Factor (PFs) for smoothness will apply to the planned thickness of the PCCP. The quality assurance adjustment for each section will include the total area of each pavement lane ~~excluding shoulders~~ *measured by the profilograph* for 0.1 mi (0.16 km) long section represented by the profile index calculated by the following formula:

$$q_s = (PF_s - 1.00) \times A \times U$$

where:

q_s = quality assurance adjustment for smoothness for one section
PFs = pay factor for smoothness
A = area of the section, SYS (m2)
U = unit price for the material $/SYS ($/m2)

For smoothness sections that are less than 0.1 mi (0.16 km) in length or require profilograph operation along both lane edges, the profile index used to obtain the smoothness pay factor used in the above formula will be determined in accordance with ITM 912.

The quality assurance adjustment for smoothness, Qs, for the contract will be the total of the quality assurance adjustments for smoothness, qs, on each section by the following formula:

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO THE SECTION 501.25 PAVEMENT SMOOTHNESS
REVISION TO THE SECTION 501.28 PAY FACTORS (CONTINUED)

$$Q_s = \Sigma\, q_s$$

SECTION PAY FACTORS FOR SMOOTHNESS ($PI_{0.0}$) ZERO BLANKING BAND	
Design Speed Greater Than 45 mph (70 km/hr)	
Profile Index in./0.1 mi. (mm/0.16 km)	Pay Factor
Over 0.00 to 1.40 in. (Over 0 to 35 mm)	1.06
Over 1.40 to 1.60 in. (Over 35 to 40 mm)	1.05
Over 1.60 to 1.80 in. (Over 40 to 45 mm)	1.04
Over 1.80 to 2.00 in. (Over 45 to 50 mm)	1.03
Over 2.00 to 2.40 in. (Over 50 to 60 mm)	1.02
Over 2.40 to 2.80 in. (Over 60 to 70 mm)	1.01
Over 2.80 to 3.60 in. (Over 70 to 90 mm)	1.00
Over 3.60 to 3.80 in. (Over 90 to 95 mm)	0.96
All pavements with a Profile Index ($PI_{0.0}$) greater than 3.80 in. (95 mm) shall be corrected to 3.80 in. (95mm).	

COMMENTS AND ACTION

REVISION TO THE SECTION 501.25 PAVEMENT SMOOTHNESS
REVISION TO THE SECTION 501.28 PAY FACTORS

DISCUSSION: Mr. Byers noted that industry is concerned that the proposal does not address smoothness requirements related to at grade intersections that are constructed under traffic in multiple phases.

Note: Plan to reintroduce at December 17, 2009 meeting.

Motion:
Second:
Ayes:
Nays:

Standard Specifications Sections affected:

109.05.1 p108; 501.26 p297; 501.27 p298; 501.28 p299; 502.20 p314; 507.06 p339

Recurring Special Provision affected:

501-R-540

Standard Sheets affected:

None

GIFE Sections affected:

Section 8

Action:
_____ Passed as Submitted
_____ Passed as Revised
__X__ Withdrawn

_____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

REVISION TO THE STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Remove obsolete/inferior performing sheeting material from INDOT use.
INDOT policy currently allows Type III (encapsulated lens) or Type IV or higher (microprismatic) sheeting. Type IV and higher sheeting provides higher (at least double) retroreflectivity and longer lasting sheeting (14 vs. 10 years) at a lower cost.

PROPOSED SOLUTION: Modify Standard Specification 919 to require Type IV sheeting or higher. Also modify 802 pay item for sheet sign by eliminating the "type" requirement. By eliminating encapsulated lens, we don't need to specify a "type".
The new design memo will instruct designers on the proper pay item, and will supersede DM 09-04 (DG 3 on overheads).

APPLICABLE STANDARD SPECIFICATIONS: 802, 919

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 75-2

APPLICABLE SECTION OF GIFE: Unknown

APPLICABLE RECURRING SPECIAL PROVISIONS: 802-T-171 (proposed to delete in entirety)

Submitted By: Todd Shields

Title: Manager, Office of Technical Services

Organization: INDOT

Phone Number: 317-233-4726

Date: September 21, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? Ad-hoc (Joe Novak, Dana Plattner, Todd Tracy, Ting Nahrwald, Carl Tuttle (retired), Todd Shields); reviewed by District Traffic Engineers and material suppliers (3M, Brightline, Epoplex)

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO THE SECTION 802.12 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 802, BEGIN LINE 302, DELETE AS FOLLOWS:

Pay Item	**Pay Unit Symbol**
Box Truss Sign Structure Foundation, _____ (type)	EACH
Bridge Bracket Assembly	EACH
Cable Span Sign Structure Foundation, _____ (type)	EACH
Cantilever Sign Support Foundation, _____ (type)	EACH
Overhead Balanced Cantilever Sign Structure Foundation, _____ (type)	EACH
Overhead Sign Structure, _____ (type)	EACH
Overhead Sign Structure, _____ (type), Remove	EACH
Reference Post	EACH
Sign and Supports, Wide Flange, Remove	EACH
Sign Post, _____ (type)	LFT (m)
Sign Post, Square, _____ (type), Reinforced Anchor Base	LFT (m)
Sign Post, Square, _____ (type), Unreinforced Anchor Base	LFT (m)
Sign, Double Faced, Sheet, ~~_____ type~~, With Legend, _____ (thickness)	SFT (m2)
Sign, Overhead, Remove	EACH
Sign, Panel, With Legend	SFT (m2)
Sign, Panel, Relocate	EACH
Sign, Panel, Remove	EACH
Sign, Sheet Assembly, Relocate	EACH
Sign, Sheet, ~~_____ type~~, With Legend, _____ (thickness)	SFT (m2)
Sign, Sheet, and Supports, Remove	EACH
Sign, Sheet, Relocate	EACH
Sign, Sheet, Remove	EACH
Sign, Sheet, With Legend	EACH
Structural Steel, Breakaway	LBS (kg)
Wide Flange Sign Post Support Foundation, _____ (type)	EACH

REVISION TO THE STANDARD SPECIFICATIONS

REVISION TO THE SECTION 919.01 TRAFFIC SIGNS

The Standard Specifications are revised as follows:

SECTION 919, BEGIN LINE 81, INSERT AS FOLLOWS:

(b) Sheeting Material

Only sheeting materials from the Department's list of approved Sign Sheeting Materials shall be used. *Type IV or higher sheeting shall be used for highway signs. The sheeting type for the sign copy and border shall be the same type or higher than the sheeting type used for the background.* Sheeting materials will be placed and maintained on the Department's approved list in accordance with ITM ~~806, procedure G~~ *930*.

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 09-__
Technical Advisory

November 10, 2009 DRAFT

TO: **All Design, Operations, and District Personnel, and Consultants**

FROM: _____
Anthony L. Uremovich
Design Resources Engineer
Production Management Division

SUBJECT: **Sign-Sheeting Material and Overhead-Sign Lighting**

REVISES: ***Indiana Design Manual*** **Sections 75-2.02, and 75-2.03 item 1**

SUPERSEDES: **Design Memorandum 09-04 Technical Advisory**

EFFECTIVE: **_____, 2010, Letting**

I. SIGN-SHEETING MATERIAL

Sign-sheeting material will consist of that shown in Recurring Special Provision _____, attached herewith. Identification of such material as encapsulated or enclosed lens is no longer required on the plans or in the pay-item names.

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 1. DRAFT DESIGN MEMORANDUM (CONTINUED)

A. Sheet Signs

The sheeting thickness for a sheet sign mounted onto a panel sign is always 0.080 in. (2.03 mm). The new pay-item code numbers and names are as follows:

802-_____	Sign, Sheet, With Legend, 0.080 in.
	Sign, Sheet, With Legend, 2.03 mm
802-_____	Sign, Sheet, With Legend, 0.100 in.
	Sign, Sheet, With Legend, 2.54 mm
802-_____	Sign, Sheet, With Legend, 0.125 in.
	Sign, Sheet, With Legend, 3.18 mm

(Need to add items for double faced signs)

B. Panel Signs

The pay item 802-07057, Sign, Panel, With Legend, remains valid for both ground-mounted and overhead signs.

The plans' Sign and Post Summaries' column headings have been revised accordingly. Quantities should be placed in each column's appropriate boxes. The pay unit for all signs remains square foot (square meter).

II. OVERHEAD-SIGN LIGHTING

Sign lighting and related appurtenances such as a sign walkway as described in *Indiana Design Manual* Section 75-2.03, will not be required for an overhead-sign or box-truss structure, and should not be shown on the plans.

However, conduit should continue to be specified to be installed in the foundations. A structure handhole should continue to be specified to be placed toward the base of the sign support. A grounding system should continue to be specified.

Sign-structure mounting height should continue to be specified as described in Section 75-2.03, if a lighting-support assembly or walkway must be retrofitted.

alu

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 1. DRAFT DESIGN MEMORANDUM (CONTINUED)

SHEET SIGN AND POST SUMMARY CHANGE

GROUND-MOUNTED SIGN AREA (ft^2)			MOUNTED ON PANEL SIGN, AREA (ft^2)
0.080 in. THICK.	0.100 in. THICK.	0.125 in. THICK.	0.080 in. THICK.

PANEL SIGN AND POST SUMMARY CHANGE

SIGN SUMMARY	
PANEL SIGN AREA (ft2)	

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 2. FHWA LETTER TO DEPUTY COMMISSIONER OF HIGHWAY MANAGEMENT

U.S. Department of Transportation
Federal Highway Administration

Indiana Division

575 North Pennsylvania Street, Room 254
Indianapolis, Indiana 46204

November 9, 2008

In Reply Refer To:
HDA-IN

Mr. Jim Poturalski
Deputy Commissioner of Highway Management
Indiana Department of Transportation
100 North Senate Avenue, N-758
Indianapolis, Indiana, 46204

Dear Mr. Poturalski:

The Federal Highway Administration (FHWA) has reviewed your letter dated October 26, 2009, and concurs with the Indiana Department of Transportation (INDOT) and your proposed actions to turn off existing overhead sign lighting, as well as no longer install lighting on new overhead sign installations.

Both the National Manual on Uniform Traffic Control Devises (MUTCD) and the Indiana MUTCD allow INDOT to stop illuminating signs if an engineering study shows that retro reflection will perform effectively without illumination. The information presented in the letter and the involvement of Karen Stippich in the field reviews and meetings confirms INDOT has completed an engineering study. We ask that you would send a copy of the engineering study to FHWA for our files.

We agree with INDOT's approach to develop a policy and business practices that requires an evaluation process for turning off existing light overhead signs. The development of a policy requiring a minimum of Type IV copy on Type IV background is acceptable as well. We request that you send a copy of these policies and business practices to FHWA.

The commitment to continue monitoring sign sheeting performance is crucial. Please keep the Indiana Division informed on the progress of the sign lighting being turned off and any issues that develop.

If you have any further questions please contact Karen Stippich, Intelligent Transportation Systems and Operations Engineer, at 317-226-7122.

RECOVERY.GOV

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 2. FHWA LETTER TO DEPUTY COMMISSIONER OF HIGHWAY MANAGEMENT (CONTINUED)

Sincerely,

For Robert F. Tally,
Division Administrator

cc: transmitted by e-mail
Mike Bowman, INDOT
Todd Shields, INDOT
Bob Tally,
Max Azizi, FHWA
David Unkefer. FHWA
Karen Stippich, FHWA
FHWA: HDA-IN: KLStippich 7122: lmh: 2009-11-09

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY)

Revised 7/10/09

INDIANA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS MANAGEMENT

PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS
ITM No. 930-09P

1.0 SCOPE.

1.1 This test procedure covers the methods that highway reflective sheeting is evaluated on the Departments outdoor weathering evaluation deck, and the procedures for placement, maintenance, or removal from an approval list.

1.2 If the reflective sheeting materials have completed National Transportation Product Evaluation Program (NTPEP) evaluation or have been submitted to NTPEP for evaluation, the manufacturer shall submit the NTPEP evaluation data to the Department as the data is received by the manufacturer.

1.3 The values stated in either English or acceptable SI metric units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, SI metric units are shown in parenthesis. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other, without combining values in any way.

1.4 This ITM may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 REFERENCES.

2.1 AASHTO Standards.

M 268 Specification for Retroreflective Sheeting for Traffic Control

2.2 ASTM Standards.

D 4956 Specification for Retroreflective Sheeting for Traffic Control
E 991 Practice for Color Measurement of Fluorescent Specimens
E 1349 Test Method for Reflectance Factor and Color by Spectrophotometry Using Bidirectional Geometry
E 1709 Test Method for Retroreflective Signs Using a Portable Retoreflectometer

2.3 ITM Standards.

806 Approval List Requirements
804 Sample Material Certification Forms

3.0 TERMINOLOGY. Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101 and ASTM E 1709.

4.0 SIGNIFICANCE AND USE. This ITM is used to evaluate, approve, maintain approval, and remove from the approval listing reflective sign sheeting materials which are placed on the Department's list of approved Reflective Sheeting Materials. Each color, class of adhesive and type of reflective sheeting material will be evaluated separately.

5.0 APPARATUS.

5.1 Retroreflectometer, ART Technology, model 930 in accordance with ASTM E 1709

5.2 Spectrophotometer, BYK Gardner Color Guide 45/0 in accordance with ASTM E 1349 and HunterLab MiniScan XE- Plus 45/0 in accordance with ASTM E 991

5.3 Outdoor Weathering Evaluation Deck, in accordance with AASHTO M 268

5.4 Calibration. Annual certification of calibration of all instruments shall be done by the instrument manufacturer. Before each use of an instrument, a verification of each instrument calibration will be done using the secondary standards that are provided with the instruments.

6.0 SAMPLING. The manufacturer shall furnish at no cost to the Department, samples of the reflective sheeting material. The reflective sheeting shall be randomly selected from a normal production run of material.

7.0 PREPARATION OF TEST SPECIMEN. For each color, class of adhesive and type of sheeting, the manufacturer shall submit eight pieces of reflective sheeting with the protective backing paper. The reflective sheeting shall be in accordance with AASHTO M 268 except that the dimensions of the reflective sheeting shall be 9 in. x 14 in. (225 mm x 350 mm). The Department will apply four pieces of the reflective sheeting to 8 in. x 12 in. aluminum panels according to the manufacturer's recommendations. A slit through the sheeting material will be made on one panel. The slit will be placed 2 in (50 mm) from the top and 2 in (50 mm) from the left side and the length of the slit will be 4 in (100 mm). Each panel will have a weather resistant label (or marking) placed on the backside of the panel. The label will identify the manufacturer, sheeting type and adhesive class. The panels will not be clear coated after the application of the reflective sheeting material.

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

8.0 OUTDOOR WEATHERING EVALUATION PROCEDURE.

8.1 The manufacturer of the material shall fill out the Preliminary Product Evaluation Form in Appendix A for each sheeting type, adhesive class, and color of sheeting that the manufacturer is requesting to be added to the approved list.

8.2 The manufacturer of the material shall submit samples with the Preliminary Product Evaluation Form, laboratory test reports, all applicable NTPEP test reports or evidence of NTPEP submissions, product data sheets, and a QCP in accordance with section 5.1 of ITM 806 to the Division of Highway Operations. The samples of the material will be used for evaluation on the Department's outdoor weathering evaluation deck.

8.3 The panel with the slit, in addition to two other panels will be placed on the test deck. The color coordinates x & y, luminance factor Y, and coefficient of retroreflection will be determined on each of the panels prior to installation.

8.4 The color coordinates and luminance factor of the fluorescent sheeting will be determined in accordance with ASTM E 991 using a HunterLab MiniScan XE-Plus 45/0 spectrophotometer. The color coordinates and luminance factor on all other sheeting will be determined in accordance with ASTM E 1349 using a BYK Gardner Color Guide 45/0 or a HunterLab MiniScan XE-Plus 45/0 spectrophotometer. A minimum of five readings for each of the color coordinates and the luminance factor will be taken on each panel and averaged.

8.5 The coefficient of retroreflection will be determined in accordance with ASTM E 1709 and the following:

8.5.1 The observation angle will be of 0.2°

8.5.2 The entrance angles will be -4° and +30°

8.5.3 The rotational angles will be of 0° and 90°

8.5.4 An additional 45° rotational angle will be tested for warning sign materials

8.6 After installation on the outdoor weathering test deck, the color coordinates, luminance factor, coefficient of retroreflection and visual observation of sheeting delamination will be determined on each panel a minimum of twice a year throughout the evaluation period. The length of time for all outdoor weathering evaluations will be in accordance with AASHTO M 268, except type I sheeting will be evaluated for 36 months.

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

9.0 CALCULATIONS.

9.1 The average coefficient of retroreflection of the reflective sheeting material for each of the panels is cal;culated to the nearest 1 cd/lux/m² for those materials with a coefficient of retroreflection above 10 cd/lux/m^2. For coefficient of retroreflection readings of 10 or less, the average coefficient of retroreflection will be recorded to the nearest 0.1 cd/lux/m^2.

9.2 The average of the color coordinates x & y is calculated to the nearest 0.0001 unit and the luminance factor Y is calculated to the nearest 0.01% for the reflective sheeting material for each of the panels.

10.0 REPORT. The average data for the color coordinates, luminance factor, coefficient of retroreflection and the visual observation of delamination around the slit from the outdoor weathering evaluation on each color, class of adhesive and type of reflective sheeting will be tabulated into the final report.

11.0 REFLECTIVE SHEETING MATERIAL APPROVAL LIST.

11.1 Approval of Reflective Sheeting Material. A reflective sheeting material that maintains the color and coefficient of retroreflection in accordance with the requirements of AASHTO M 268 and does not delaminate throughout the full duration of the outdoor weathering evaluation process of this ITM procedure may be placed on the approval list.

11.2 Maintaining Approval. To maintain approval, the manufacturer shall submit an annual certification of compliance in accordance with ITM 804 and test reports for each color, type of sheeting and class of adhesive to the Division of Highway Operations.

11.3 Removal from Approval List. Reflective sheeting material will be removed from an approval list for, but not limited to, the following reasons:

11.3.1 Changes in the materials or production process

11.3.2 If three consecutive years elapse without furnishing the reflective sheeting material

11.3.3 Performance of the reflective sheeting no longer meets the intended purpose

11.3.4 Failure to annually submit certifications of compliance and test reports

11.3.5 Changes to the QCP without notification to the Department

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

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Appendix A

INDIANA DEPARTMENT OF TRANSPORTATION
OPERATIONS SUPPORT DIVISION
PRELIMINARY INFORMATION FOR PRODUCT MATERIAL EVALUATION

Trade Name: _____ Date: _____

Manufacturer: _____ Patented? Yes _____ No _____ Applied for _____

Address: _____
Street No (P. O. Box) City State Zip Code

Representative: _____ Phone No ( )_____

Address: _____
Street No (P. O. Box) City State Zip Code

Product Information: _____

_____

Materials Composition: _____

_____

_____

** Is this product considered hazardous material when disposing of non-used or surplus materials? Yes _____ No _____

** What is the shelf life of this material? Years _____Months _____N/A _____

Recommended Use (Primary): _____

_____

_____

Recommended Use (Alternate):_____

_____

_____

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

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Advantages and/or Benefits: _____

_____

_____

** Materials specifications by manufacturer, installation/operation manual, literature, test results, guarantee, hazardous material data sheets, plan, picture or sketch are required to be submitted with this form. In the case of electronic devices the schematic diagram, parts list, and parts layout diagram are required to be submitted for each printed circuit board within the device.

Meets following specifications:

AASHTO: _____ _____

ASTM: _____ _____

OTHER: _____

Use by highway authorities or similar agencies in other states.

Agency	Years Used	Remarks
_____	_____	_____
_____	_____	_____
_____	_____	_____

** Has product ever been evaluated by and rejected for use by a governmental agency?

Yes _____ No _____ If yes, by what agency and for what reason:

_____

_____

Will demonstration be provided? Yes _____ No _____

Availability: Seasonal _____ Non-seasonal _____ Delivery at site _____

After receipt of order, are quantities limited? Yes _____ No _____

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

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Appendix A

Will laboratory analysis be furnished? Yes _____ No _____

** Approximate cost: _____ Royalty Cost: _____

When was the product introduced to the market? _____

This product is an alternate for what product? _____

_____

_____

Will warranty be provided? Yes _____ No _____ If yes, for how long? _____

Background of company, including principal products: _____

_____

_____

_____

What offices of the Indiana Department of Transportation have been contacted?

_____

Additional Information: _____

_____

_____

_____

_____

(Attach additional sheets as necessary)

REVISION TO THE STANDARD SPECIFICATIONS

BACKUP 3. ITM NO. 930-09P PROCEDURE FOR OUTDOOR WEATHERING EVALUATION AND APPROVAL LIST REQUIREMENTS FOR REFLECTIVE SHEETING MATERIALS (NO CHANGE PROPOSED; FOR INFORMATION ONLY) (CONTINUED)

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Appendix A

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Person furnishing information: _____
Name

_____
Title

Address: _____
Street No (P. O. Box)

_____
City

_____
State Zip Code

Items marked ** are required to be responded to or further consideration may not be given for this product.

Please mail this form to:

Manager, Office of Technical Services
100 N. Senate Ave., Room N925
Indianapolis, IN 46204-2249

If INDOT elects to evaluate your product/material, ship samples to:

Traffic Evaluations Engineer
Indiana Department of Transportation
6400 E. 30th Street
Indianapolis, IN 46219-8222

COMMENTS AND ACTION

REVISION TO THE SECTION 802.12 BASIS OF PAYMENT
REVISION TO THE SECTION 919.01 TRAFFIC SIGNS

DISCUSSION: Mr. Shields distributed some modifications to the proposal. The changes include elimination of the word “Type” from the double faced sheet sign pay item; adding a sunset date of the April 2012 letting for inclusion of conduit, handholes, and grounding system in the proposed Design Memo; and modifications to Standard Drawing 802-SNGS-05 to eliminate references to “Encapsulated Lens”.

Motion: Mr. Shields
Second: Mr. Andrewski
Ayes: 10
Nays: 0

Standard Specifications Sections affected:
919.01
926.01 p.990;
926.02 p.992; p.993

Recurring Special Provision affected:

802-T-171 SIGN SHEETING MATERIAL

Standard Sheets affected:
802-SNGS-05

GIFE Sections affected:

None

Action:
_____ Passed as Submitted
__X__ Passed as Revised
_____ Withdrawn

_X_ 2012 Standard Specifications Book

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

__X_ Revise RSP (No.802-T-171)
Effective Jan. 01, 2010 Letting
RSP Sunset Date: _____

Standard Drawing Effective _____
_____ Create RPD (No. _____)
Effective _____ Letting
_____ Technical Advisory

GIFE Update Req’d.? Y ___ N __X__
By _____ Addition or _____ Revision

Frequency Manual Update Req’d?Y___N_X_
By _____ Addition or _____ Revision

Received FHWA Approval? _X_