



INDIANA DEPARTMENT OF TRANSPORTATION

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Indianapolis, Indiana 46204

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Eric Holcomb, Governor
Joe McGuinness, Commissioner

APPROVED MINUTES

March 16, 2017 Standards Committee Meeting

*(Changes to the Final Draft Minutes by the Action of the Committee
shown as highlighted in yellow)*

MEMORANDUM

May 02, 2017

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the March 16, 2017 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow at 09:00 a.m. on March 16, 2017 in the N955 Bay Window Conference Room. The meeting was adjourned at 11:35 a.m.

The following committee members were in attendance:

Greg Pankow, Chairman, Acting Construction Management Director
Michael Beuchel, Contract Administration Division
Dave Boruff, Traffic Engineering Division
Mark Orton, Bridges Division
Kurt Pelz, Construction Management Division
Kumar Dave, Pavement Engineering, Highway Design
Matthew Beeson, Materials Engineer, Materials Management
Michael Koch, Fort Wayne District Area Engineer
Peter Yao, Road Services
Rob Goldner, Manager, Construction Technical Support

Also in attendance were the following:

Andrew Pangallo, INDOT
Dan Osborn, ICI
Lana Podorvanova, INDOT
Ting Nahrwold, INDOT
Joe Bruno, INDOT
Nayyar Siddiki, INDOT
Tom Duncan, FHWA
Jim Blazek, D2 Land & Water Resource
Megan Yount, Heritage Research Group
Jason Wielinski, Heritage Research Group

Nathan Awwad, INDOT
Joe Hile, Specialties Company, LLC
Kirsten Pauley, APAI
Steve Duncan, INDOT
Stephanie Wagner, INDOT
Derrick Hauser, INDOT
Scott Trammell, INDOT

The following items were listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

1. *Approval of the Minutes from the February 16, 2017 meeting*

DISCUSSION: Mr. Pankow requested a motion to approve the minutes, as revised concerning changes and updates made to standard drawing 801-TCCO-05, as discussed from the February 16, 2017 meeting.

Motion: Mr. Beeson

Second: Mr. Koch

Ayes: 9

Nays: 0

ACTION:

PASSED AS REVISED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

(No items were listed)

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

OLD BUSINESS

Item No. 02 11/18/16 (2016 SS) Mr. Beeson pg 4

SECTION 214

~~GEOTECHNICAL~~ ~~SOIL FABRICS~~ ~~GEOSYNTHETICS~~

616.02

Materials

616.12

Method of Measurements

616.13

Basis of Payment

SECTION 918

~~SOIL FABRICS~~ ~~GEOSYNTHETICS~~

ACTION:

PASSED AS REVISED

Item No. 03 11/18/16 (2016 SS) Mr. Beeson pg 18

203.25

Embankment Without ~~Density~~ ~~Stiffness~~
Control

ACTION:

PASSED AS REVISED

Item No. 05 11/18/16 (2016 SS) Mr. Beeson pg 23
203.09 General Requirements
203.26 Proofrolling

ACTION: PASSED AS REVISED

NEW BUSINESS

Item No. 1 (2016 SS) Mr. Beeson pg 30
SECTION XXX COLD CENTRAL PLANT RECYCLING, CCPR

ACTION: PASSED AS REVISED

Item No. 2 (2016 SS) Mr. Beeson pg 43
203.20 Rock and Shale Embankment
203.21 Embankment on Hillsides or Slopes

ACTION: WITHDRAWN

Item No. 3 (2016 SS) Ms. Phillips pg 51
Recurring Special Provision:
702-X-XXX *PERMANENT DECK FORM ANGLES*

ACTION: PASSED AS SUBMITTED

Item No. 4 (2016 SS) Ms. Phillips pg 58
Recurring Special Provision:
801-R-542 *WORKSITE ADDED PENALTY SIGNS*

ACTION: PASSED AS SUBMITTED

Item No. 5 (2016 SS) Mr. Beeson pg 62
508.02(b) Proportioning System

ACTION: PASSED AS SUBMITTED

cc: Committee Members
FHWA
ICI

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: One type of geotextile for riprap and underdrains is available to use in current Standard Specifications. Geotextile should be selected based on soils type, drainage condition, etc. based on JTRP study recommendations. In addition, there are currently no standard specifications or special provisions for geotextile for subgrade stabilization, Geocell Confining system, and Geomembrane. When using the current spec in projects, this caused delays in material acceptance during construction. Site designers have been recommending and selecting these materials for some time, but our specifications have not kept pace.

PROPOSED SOLUTION: Geosynthetics are a product that can be divided into Geotextile, Geocell, Geomembrane, Geogrid etc. With these revisions, designers would be able to select geotextile based on soils type and other environmental conditions. Each type of material will have several sources, providing competition.

Section 214 is also being modified to include geotextiles and additional description, as that section is often referenced for this material.

Section 616 is being edited for clarity and to accommodate the proposed changes to the 918 section.

Numerous other editorial and reference changes will be needed as part of this spec change.

APPLICABLE STANDARD SPECIFICATIONS: 918, 214, 616

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: 4.15

APPLICABLE RECURRING SPECIAL PROVISIONS: None

PAY ITEMS AFFECTED: yes

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Geosynthetics manufacturers, vendors, Pavement design Engineer and Geotechnical group

IMPACT ANALYSIS (attach report):

Submitted By: Matt Beeson for Geotechnical Services

Title: State Materials Engineer

Organization: OMM

Phone Number: 317-610-7251x204

Date: 02/20/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? yes

Will approval of this item affect the Approved Materials List? yes

Will this proposal improve:

Construction costs? yes

Construction time? yes

Customer satisfaction? Yes

Congestion/travel time? No

Ride quality? yes

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? No

For construction workers? no

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? Yes

Will this change provide the contractor more flexibility? Yes

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

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

Is this proposal needed for compliance with:

Federal or State regulations? Yes

AASHTO or other design code? Yes

Is this item editorial? No

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

REVISION TO STANDARD SPECIFICATIONS
SECTION 214 - GEOGRID

The Standard Specifications are revised as follows:

SECTION 214, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 214 - ~~GEOGRID~~GEOSYNTHETICS

214.01 Description

This work shall consist of furnishing and installing ~~geogrid~~geosynthetics as shown on the plans or as directed by the Engineer and in accordance with 105.03.

214.02 Materials

Materials shall be in accordance with ~~918.05~~the following:

Geotextile for Pavement and Subgrade.....	918.02
Geogrid	918.05
Coarse Aggregate.....	904.03

Note 1: Coarse Aggregate No. 2, 5, 53, 73, shall be used only.

Note 2: ACBF Slag shall not be ~~permitted~~allowed.

CONSTRUCTION REQUIREMENTS

214.03 Foundation Preparation

The embankment foundation shall be cleared and grubbed in accordance with 201 and excavated using lightweight equipment to minimize disturbance of the embankment foundation surface soils. Construction activities using equipment which cause pumping and rutting of the foundation soils shall be prevented where possible and shall otherwise be minimized. Fine grading may be waived where impractical. ~~However, w~~When very soft soil is encountered, the embankment foundation shall be cleared of all trash and rubbish materials without disturbing the vegetation cover or root mat. The embankment foundation shall be subject to approval prior to placement of ~~geotextile or geogrid~~geosynthetics. Proofrolling of the embankment foundation will not be required ~~in accordance with 203.09 when geotextile, geogrid, or a combination of geotextile and geogrid is~~geosynthetics are used in construction of embankment foundation treatment.

(a) Geotextile as a Drainage Blanket

Geotextile shall be stored in such a manner as to prevent exposure to direct sunlight and damage by other construction activities. ~~Prior to the installation of the geotextile, the surface shall be cleared as described above.~~ Geotextile shall be placed taut and transversely after backfilling ~~the~~ all wheel tracks. Geotextile shall be ~~placed~~overlapped by 3 ft and sewn in accordance with the manufacturer's guidelines.

Coarse aggregate No. 2 or No. 5 shall be placed as directed and encapsulated with geotextile. Coarse aggregate shall be placed by spreading dumped material ~~off on over~~ previously placed material with ~~a bulldozer blade or end loader~~light equipment; in such a manner as to

REVISION TO STANDARD SPECIFICATIONS
SECTION 214 – GEOGRID

*prevent damage to the geotextile. Dumping of coarse aggregate shall be ~~permitted~~ allowed on initial working platform. The overlap shall be staggered throughout the roadway profile. Coarse aggregate shall be placed to the full required thickness and compacted before any loaded trucks are allowed on the blanket. **A-The** drainage blanket shall have a positive drainage. ~~The first lift of the embankment shall be constructed with light equipment.~~*

No vehicles or construction equipment shall be allowed on the geotextile prior to placement of the coarse aggregate. Damaged geotextile shall be repaired or replaced as directed. Damaged geotextile may be patched by placing a piece of the same geotextile over the damaged area. The overlap shall be at least 3 ft wide. The remaining lifts of the embankment shall be in accordance with 203.23.

(b) Geotextile placed in Pavement, Subgrade, or Embankment

The subgrade or embankment shall be proofrolled in accordance with 203.26 and any defect or rut shall be repaired as directed prior to the geotextile placement. Geotextile shall be placed taut, without wrinkles and stretched in tension. Coarse aggregate shall be placed with a minimum disturbance to grade. Any damage to geotextile shall be repaired in accordance with 214.03(a). The remaining grade shall be constructed in accordance with 207.

Geotextile shall be covered within three calendar days of placement.

214.04(c) Geogrid Placement in Embankment and Subgrade

The geogrid shall be installed in accordance with the Engineer's designs or the manufacturer's recommendations. The geogrid shall be kept taut during placement of the initial lift of backfill. Installation shall require the use of stakes, staples, sandbags, pile of granular fill, or other approved means to hold the geogrid in place during fill placement operations. Type IA geogrid shall be used for embankment foundation treatment. Type IB geogrid shall be used for subgrade treatment, type IV. When placing type IA geogrid, any rutting in the granular material shall not exceed 3 in. ~~in embankment foundation. Geotextile may be used and placed as directed.~~ The Engineer may increase the lift thickness to obtain stability of the granular material.

If required by the Engineer, the geogrid material supplier shall provide a qualified manufacturer's representative on the contract site at the start of the work to assist the Contractor. The representative shall also be available during the construction when required by the Engineer or the Contractor.

When type IB geogrid is used, proofrolling shall be performed in accordance with 203.26 prior to placing the type IB geogrid. ~~Deflection or rutting shall not exceed 1 in. Any defect shall be repaired as directed.~~ The first 6 in. of coarse aggregate No. 53 shall be spread and compacted with a 10 t roller in static mode. The spreading and compaction of the aggregate shall be performed so that adequate interlocking of the aggregate and geogrid is obtained. The second 6 in. of coarse aggregate No. 53 shall be constructed in accordance with 301.

REVISION TO STANDARD SPECIFICATIONS
 SECTION 214 – GEOGRID

SECTION 214, BEGIN LINE 64, DELETE AND INSERT AS FOLLOWS:

214.054 Fill Placement

SECTION 214, BEGIN LINE 72, DELETE AND INSERT AS FOLLOWS:

214.065 Method of Measurement

Geotextile for pavement **and**, subgrade, ~~and embankment~~ will be measured by the square yard, for the type specified. Geotextile for coarse aggregate and drainage blankets will be measured in accordance with 301 and 616, respectively. Geogrid will be measured by the square yard, for the type specified. The quantity will be computed based on the total area of geogrid synthetics shown on the plans, ~~exclusive of the area of overlaps~~. The aggregate used for the embankment foundation improvement will be measured in accordance with 301. The geogrid reinforced subgrade ~~shall~~ will be measured in accordance with 207.

214.076 Basis of Payment

The accepted quantity of geotextile will be paid for at the contract unit price per square yard per type of geotextile. The accepted quantities of geogrid will be paid for at the contract unit price per square yard per type of geogrid. The aggregates will be paid for in accordance with 301. The geogrid reinforced subgrade ~~shall~~ will be paid for in accordance with 207.

Payment will be made under:

Pay Item	Pay Unit Symbol
Geotextile for Pavement, Subgrade, or Embankment	SYS
Type	
Geotextile for Subgrade SYS	
type	
Geogrid, SYS	
type	

The cost of furnishing the materials, manufacturer's representative, all labor and equipment required for furnishing and placing the *geotextile or* geogrid, all work necessary to establish grades, geogrid splices, overlaps, stakes or pins, supplemental product test data, and patching or replacement of damaged *geotextile or* geogrid shall be included in the cost of this work.

REVISION TO STANDARD SPECIFICATIONS

SECTION 616 – RIPRAP AND SLOPEWALL

616.02 MATERIALS

616.12 METHOD OF MEASUREMENTS

616.13 BASIS OF PAYMENT

(Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 616, BEGIN LINE 10, INSERT AS FOLLOWS:

616.02 Materials

Materials shall be in accordance with the following:

Asphalt Joint Filler.....	906.01
Clay	903.01
Concrete, Class A.....	702
Fine Aggregate, Size No 23	904
Geotextile <i>for Riprap</i>	918.02
Portland Cement.....	901.01(b)
Precast Concrete Riprap.....	904.04(e)
Riprap.....	904.04
WWR, Smooth.....	910.01(b)5
Water.....	913.01

SECTION 616, BEGIN LINE 153, INSERT AS FOLLOWS:

Grouted riprap and precast concrete riprap, including the area occupied by the wedge course, will be measured by the square yard, parallel to the slope. Slopewall will be measured by the square yard. Holes for inspecting slope walls will be measured per each. Geotextiles used under riprap will be measured ~~per type~~ by the square yard *by the type specified*, complete in place. Uniform riprap will be measured by the ton.

SECTION 616, BEGIN LINE 183, INSERT AS FOLLOWS:

Payment will be made under:

Pay Item	Pay Unit Symbol
Borrow, Cohesive.....	CYS
Geotextiles <i>for Riprap</i> , _____ type	SYS

REVISION TO STANDARD SPECIFICATIONS
SECTION 918 - SOIL FABRICS

The Standard Specifications are revised as follows:

SECTION 918, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 918 – SOIL FABRICS~~GEOSYNTHETICS~~

918.01 Fabric for Waterproofing *[Note: No changes, moved to 918.06.]*

Fabric for waterproofing shall be treated cotton in accordance with ASTM D 173, woven glass in accordance with ASTM D 1668, or glass fiber mat in accordance with ASTM D 2178. Material furnished under this specification shall be covered by a type C certification in accordance with 916.

918.02 Geotextile for Use Under Riprap

The material used shall consist of a non-woven geotextile consisting of strong, rot resistant, chemically stable long-chain synthetic polymer material dimensionally stable with distinct and measurable openings. The plastic yarn or fibers used in the geotextile, shall consist of any long-chain synthetic polymer composed of at least 85% by weight of polyolefins, polyesters, or polyamides, and shall contain stabilizers and inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The geotextile shall be calendared or otherwise finished so that the yarns or fibers will retain their relative position with respect to each other. Silt film geotextiles will not be allowed unless approved.

The geotextile shall meet the following physical requirements.

GEOTEXTILE MATERIAL PROPERTIES

TEST	METHOD	REQUIREMENTS*
Tensile Strength	Grab Tensile Strength, ASTM D 4632	200 lb
Elongation	Grab Tensile Strength, ASTM D 4632	15%
Seam Strength	Grab Tensile Strength, ASTM D 4632	180 lb
Puncture Strength	ASTM D 4833	80 lb
Trapezoid Tear	ASTM C 4533	50 lb
Ultraviolet Degradation at 150 h	ASTM D 4355	70% strength retained
Apparent Opening Size, AOS	ASTM D 4751	AOS shall be No. 50 standard sieve or filter
Permeability**	ASTM D 4491 (Permittivity)	0.01 cm/sec or >

REVISION TO STANDARD SPECIFICATIONS
SECTION 918 - SOIL FABRICS

*	Use value in weaker principal direction. All numerical values represent minimum average roll value and test results from any sampled roll in a lot shall meet or exceed the minimum values in the table. Lots shall be sampled according to ASTM D 4354.
**	The nominal coefficient of permeability shall be determined by multiplying permittivity value by nominal thickness. The nominal thickness is measured under a normal load of 280 psi.

The geotextiles to be used will be selected from the list of approved Geotextiles for Use Under Riprap.

A manufacturer requesting that a geotextile be added to the approved list shall provide a certification documenting compliance with the above requirements and a sample to the Office of Materials Management. The certification shall be prepared by the manufacturer which addresses all the required information as shown on a sample certification form in ITM 804. No relabeled materials will be considered for approval. A specified material on the approved list will not be listed under more than one name.

When it is determined the material is acceptable, it will be added to the list of approved Geotextiles for Use Under Riprap and it may be used upon publication of the list.

918.03 Geotextile for Use With Underdrains

This material shall consist of a non-woven needle punched or heat bonded geotextile consisting of strong, rot resistant, chemically stable long chain synthetic polymer materials, which are dimensionally stable relative to each other including selvages. The plastic yarn or fibers used in the geotextile shall consist of at least 85% by weight of polyolefins, polyesters, or polyamides. The plastic yarn or fibers shall have stabilizers and inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure.

The geotextile shall be in accordance with the physical requirements as follows:

TEST	METHOD	REQUIREMENTS ⁽²⁾
Grab Strength	ASTM D 4632	80 lb
Seam Strength ⁽¹⁾	ASTM D 4632	70 lb
Puncture Strength	ASTM D 4833	25 lb
Trapezoid Tear	ASTM D 4533	25 lb
Apparent Opening Size, AOS	ASTM D 4751	Sieve No. 50 or smaller opening
Permeability	ASTM D 4491	0.1 mm/sec
Ultraviolet Degradation at 150 h	ASTM D 4355	70% strength retained
⁽¹⁾ Values will apply to both field and manufactured seams. ⁽²⁾ The value in the weaker principal direction shall be used. All numerical values will represent the minimum average roll value. Test results from a sampled roll in a lot shall be in accordance with or shall exceed the minimum values shown in the table. Lots shall be sampled in accordance with ASTM D 4354.		

REVISION TO STANDARD SPECIFICATIONS
SECTION 918 - SOIL FABRICS

~~The geotextiles to be used shall be selected from the list of approved Geotextiles for Use With Underdrains.~~

~~A manufacturer requesting that a geotextile be added to the approved list shall provide a certification documenting compliance with the above requirements and a sample to the Office of Materials Management. The certification shall be prepared by the manufacturer in accordance with 916. No relabeled materials will be considered for approval. A specified material on the approved list will not be listed under more than one name. When it is determined the material is acceptable, it will be added to the list of approved Geotextiles for Use with Underdrains and it may be used upon publication of the list.~~

918.04 Geotextile for Silt Fence

~~The silt fence fabric shall consist of a woven or non-woven geotextile consisting of strong, rot resistant, chemically stable long chain synthetic polymer materials, which are dimensionally stable relative to each other including selvages. The plastic yarn or fibers used in the geotextile shall consist of at least 85% by weight of polyolefins, polyesters, or polyamides. The plastic yarn or fibers shall have stabilizers and inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure.~~

~~The geotextile shall be in accordance with the guidelines of AASHTO AGC ARTBA, Task Force 25 and AASHTO M 288.~~

The geotextile shall be in accordance with the physical requirements as follows:

TEST	METHOD	REQUIREMENTS ⁽¹⁾	
		Wire Fence Supported	Self Supported
Grab Strength	ASTM D 4632	90 lb	90 lb
Elongation at 45 lb	ASTM D 4632		50% Max.
Apparent Opening Size ⁽²⁾	ASTM D 4751	No. 20	No. 20
Permittivity ⁽²⁾	ASTM D 4491	0.01 sec ⁻¹	0.01 sec ⁻¹
Ultraviolet Degradation at 500 h	ASTM D 4355	70% strength retained	70% strength retained
⁽¹⁾ The value in the weaker principal direction shall be used. All numerical values will represent the minimum average roll value. Test results from a sampled roll in a lot shall be in accordance with or shall exceed the minimum values shown in the above table. The stated values are for non-critical, non-severe conditions. Lots shall be sampled in accordance with ASTM D 4354. ⁽²⁾ The values reflect the minimum criteria currently used. Performance tests may be used to evaluate silt fence performance if deemed necessary by the Engineer.			

REVISION TO STANDARD SPECIFICATIONS
SECTION 918 - SOIL FABRICS

~~Material furnished under this specification shall be covered by the type of certification specified in the Frequency Manual and in accordance with 916.~~

918.01 General Requirements

Geosynthetics are polymer based products used for separation, filtration, reinforcement, liquid containment, soil and aggregate confinement and many other soil related purposes within many conventional engineered structures. When appropriate, the Department will require the use of geosynthetics meeting the categories and characteristics indicated below.

918.02 Geotextile

The geotextile shall be either non-woven or woven and consist of at least 85% long-chain synthetic polymers. The geotextile shall contain stabilizers or inhibitors added to the base polymer mix to make the filaments and yarns resistant to deterioration caused by ultraviolet radiation exposure. The geotextile shall be produced such that the yarns and fibers retain their relative positions. The nonwoven geotextile shall be needle punched, heat bonded or resin bonded.

All damaged geotextile shall be replaced for the entire width of the roll. The Contractor shall furnish the product labeled that clearly indicates the manufacturer's or supplier's name, product identification, lot number, manufactured date, roll dimensions. Geotextiles used for Department projects shall be NTPEP listed and shall be in accordance with AASHTO M 288 and the Department's Approved Materials List.

The geotextile shall meet the following requirements.

(a) Geotextile Properties for Riprap and Retention Applications

TEST	METHOD, ASTM	REQUIREMENTS ⁽¹⁾				
		Type 1A	Type 1B	Type 2A	Type 2B	Type 3
Grab Tensile Strength, min.	D 4632	200 lbs	200 lbs	250 lbs	300 lbs	250 lbs
Grab Elongation	D 4632	> 50%	< 50%	> 50%	< 50%	< 50%
CBR Puncture Strength, min.	D 6241	500 lbs	600 lbs	700 lbs	1000 lbs	950 lbs
Trapezoid Tear Strength, min.	D 4533	80 lbs	75 lbs	100 lbs	150 lbs	60 lbs
UV Degradation Resistance 500 hrs, min.	D 4355 D 6637	70%	70%	70%	70%	90%
Apparent Opening Size, AOS, min.	D 4751	>40% passing the No. 200, ≤ No. 80 sieve	<40% passing the No. 200, ≤ No. 40 sieve	>40% passing the No. 200, ≤ No. 70 sieve	<40% passing the No. 200, ≤ No. 40 sieve	≤ No. 70 sieve
Permittivity, min.	D 4491	≥ 1.2 sec ⁻¹	≥ 2.1 sec ⁻¹	≥ 1.2 sec ⁻¹	≥ 0.90 sec ⁻¹	0.28 sec ⁻¹
Notes: ⁽¹⁾ All values are minimum average roll values (MARV) as determined in accordance with ASTM D 4354.						

(b) Geotextile Properties for Underdrains and Drainage Applications

REVISION TO STANDARD SPECIFICATIONS
SECTION 918 - SOIL FABRICS

TEST	METHOD, ASTM	REQUIREMENTS ^{(1) (2)}				
		Type 1A	Type 1B	Type 2A	Type 2B	Type 3
Grab Tensile Strength, min.	D 4632	80 lbs	200 lbs	160 lbs	200 lbs	300 lbs
Grab Elongation	D 4632	> 50%	< 50%	> 50%	< 50%	< 50%
CBR Puncture Strength, min.	D 6241	175 lbs	600 lbs	410 lbs	1000 lbs	1100 lbs
UV Degradation Resistance 500 hrs, Retained, min.	D 4355 D 6637	70%	70%	70%	70%	90%
Apparent Opening Size, AOS, min.	D 4751	>40% passing the No. 200, ≤ No. 70 sieve	<40% passing the No. 200, ≤ No. 40 sieve	>40% passing the No. 200, ≤ No. 70 sieve	<40% passing the No. 200, ≤ No. 40 sieve	≤ No. 40 sieve
Permittivity, min.	D 4491	≥ 1.2 sec ⁻¹	≥ 2.1 sec ⁻¹	≥ 1.2 sec ⁻¹	≥ 1.5 sec ⁻¹	0.90 sec ⁻¹
Notes:						
⁽¹⁾ All values are minimum average roll values (MARV) as determined in accordance with ASTM D 4354.						
⁽²⁾ Type 3 value is a maximum average roll value (Max ARV) as determined in accordance with ASTM D 4354.						

(c) Geotextile Properties for Pavement or Subgrade Stabilizations

TEST	METHOD, ASTM	REQUIREMENTS ⁽¹⁾			
		Type 1A	Type 1B	Type 2A	Type 2B
Grab Tensile Strength, min.	D 4632	200 lbs	300 lbs	350 lbs	440 lbs
Wide Width Tensile , @ 5% Strain	D 4595			1200	2400
Grab Elongation, min	D 4632	15%	15%	n/a	n/a
CBR Puncture Strength, min.	D 6241	700 lbs	900 lbs	1000 lbs	2000 lbs
Trapezoid Tear Strength, min.	D 4533	75 lbs	110 lbs	n/a	n/a
UV Degradation Resistance 500 hrs, min.	D 4355 D 6637	70% retained	70% retained	n/a	n/a
Apparent Opening Size, AOS, min.	D 4751	use sieve No. 40	use sieve No. 40	use sieve No. 30	use sieve No. 30
Soil Retention, Pore Size	D 6767	n/a	n/a	290/380	320/460
Permittivity, min.	D 4491	0.05 sec ⁻¹	0.050 sec ⁻¹	0.60 sec ⁻¹	0.40 sec ⁻¹
Notes:					
⁽¹⁾ All values are minimum average roll values (MARV) as determined in accordance with ASTM D 4354 in the weaker direction.					

(d) Geotextile Properties for Silt Fence

TEST	METHOD, ASTM	REQUIREMENTS ⁽¹⁾	
		Wire Fence Supported	Self Supported
Grab Strength	D 4632	90 lbs	90 lbs
Elongation @ 45 lbs	D 4632		50% max.
Apparent Opening Size ⁽²⁾	D 4751	No. 20 sieve	No. 20 sieve
Permittivity ⁽²⁾	D 4491	0.01 sec ⁻¹	0.01 sec ⁻¹
Ultraviolet Degradation at 500 hrs	D 4355	70% strength retained	70% strength retained

REVISION TO STANDARD SPECIFICATIONS

SECTION 918 - SOIL FABRICS

(1)	The value in the weaker principal direction shall be used. All numerical values will represent the minimum average roll value. Test results from a sampled roll in a lot shall be in accordance with or shall exceed the minimum values shown in the above table. The stated values are for non-critical, non-severe conditions. Lots shall be sampled in accordance with ASTM D 4354.
(2)	The values reflect the minimum criteria currently used. Performance tests may be used to evaluate silt fence performance if deemed necessary by the Engineer.
<u>Note:</u>	1. All values are minimum average roll values (MARV) as determined in accordance with ASTM D 4354.

Material furnished under this specification shall be covered by the type of certification specified in the Frequency Manual and in accordance with 916.

918.03 Geomembrane

This material shall consist of a geomembrane fabricated from high density polyethylene, HDPE, consisting of strong, rot resistant, chemically stable long-chain synthetic polymer materials, dimensionally stable with distinct and measurable openings. The manufactures shall submit the tests for the intended use to the Department.

The geomembrane shall be meet the following requirements:

TEST	METHOD	REQUIREMENTS
Density, min.	ASTM D 1505	55 pcf
Sheet Thickness	ASTM D 5199	30 mils
Tear Resistance	ASTM D 1004	22 lbs
Resistance Soil Burial	ASTM D 3083	90% retained
pH	AASHTO T 289	Durability between 3 to 12
Roll Width	Calibered	20 ft

Material furnished under this specification shall be covered by the type of certification specified in the Frequency Manual and in accordance with 916.

914918.04 Geocell Confining System

Geocell confinement system is a lightweight, flexible mat that consists of high density polyethylene strips. The mat shall be perforated and the strips shall be ultrasonic bonded together to form a strong configuration. Cell seam strength shall be uniform over full depth.

The geocell shall meet the following requirements:

MECHANICAL PROPERTIES	METHOD	UNIT	*MD x CD
Grab Tensile Strength	ASTM D 4632	lbs	365 x 200
Grab Tensile Strength	ASTM D 4632	%	24 x 10
Trapezoidal Tear Strength	ASTM D 4533	lbs	115 x 75
CBR Puncture Strength	ASTM D 6241	lbs	675
Percent Open Area	COE-02215	%	12.6

REVISION TO STANDARD SPECIFICATIONS

SECTION 918 - SOIL FABRICS

<i>Nominal Expanded Cell Size</i>	<i>Calibered</i>	<i>in.</i>	<i>12.6 x 11.3</i>
<i>Notes:</i> * MD Machine direction x Cross direction. 1. Carbon Black shall be minimum 1.5% by weight in accordance with ASTM 5199. 2. Short term peel strength shall be 640 lbs for 6 in. depth cell.			

Material furnished under this specification shall be covered by the type of certification specified in the Frequency Manual and in accordance with 916.

SECTION 918, AFTER LINE 128, INSERT AS FOLLOWS:

918.06 Fabric for Waterproofing [Note: moved from 918.01, but unchanged]

Fabric for waterproofing shall be treated cotton in accordance with ASTM D 173, woven glass in accordance with ASTM D 1668, or glass fiber mat in accordance with ASTM D 2178. Material furnished under this specification shall be covered by a type C certification in accordance with 916.

COMMENTS AND ACTION

SECTION 214 - GEOGRID

616.02 MATERIALS

616.12 METHOD OF MEASUREMENTS

616.13 BASIS OF PAYMENT

SECTION 918 - SOIL FABRICS

DISCUSSION:

This item was introduced and presented by Mr. Beeson who explained that Geosynthetics are a product that can be divided into Geotextile, Geocell, Geomembrane, Geogrid, and the like. Mr. Siddiki explained that with the revisions shown above, designers would be able to select a more appropriate geotextile based on soils type and other environmental conditions. Each type of material will have several sources, providing competition. Standard specification section 214 has been revised to include geotextiles and additional descriptions, since that section is often referenced for this material. Also, section 616 has been edited for clarity and to accommodate the proposed changes to 918.

Mr. Beeson further noted that other minor editorial and reference revisions will be necessary as part of this spec change, once approved. Further editorial revisions, as suggested by Mr. Koch and Mr. Siddiki are as shown. Additional edits concerning geotextiles for embankments, as agreed to by the committee after the meeting, are as shown.

Mr. Beeson will author the design memo to provide clarification for designers.

Motion: Mr. Beeson Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u> </u> Passed as Submitted <u> X </u> Passed as Revised <u> </u> Withdrawn
Standard Specifications Sections referenced and/or affected: 214 pg 220 thru 222; 616 pg 440 thru 445, and 918 1007 thru 1012.	<u> X </u> 2018 Standard Specifications <u> X </u> Revise Pay Items List
Recurring Special Provision affected: NONE	<u> </u> Create RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Standard Drawing affected: NONE	<u> </u> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Design Manual Sections affected: NONE	<u> TBD </u> Standard Drawing Effective
GIFE Sections cross-references: SECTION 4.15	<u> </u> Create RPD (No. <u> </u>) Effective <u> </u> Letting <u> X </u> GIFE Update <u> X </u> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Compaction with minimum weight and proofrolling would help in construction quality. By specifying geotextile and aggregates would improve the quality of such embankment.

PROPOSED SOLUTION: Compaction with minimum weight and proof rolling would help in construction quality. By specifying geotextile and aggregates would improve the quality of such embankment.

APPLICABLE STANDARD SPECIFICATIONS: 203.25

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: 3.10

APPLICABLE RECURRING SPECIAL PROVISIONS: None

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Office of Geotechnical group

IMPACT ANALYSIS (attach report):

Submitted By: Matt Beeson for Geotechnical Services

Title: State Materials Engineer

Organization: OMM

Phone Number: 317-610-7251x204

Date: 02/20/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections?

Will approval of this item affect the Approved Materials List? None

Will this proposal improve:

Construction costs? None

Construction time? None

Customer satisfaction? Yes

Congestion/travel time? None

Ride quality? yes

Will this proposal reduce operational costs or maintenance effort? None

Will this item improve safety:

For motorists? None

For construction workers? none

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? Yes

Will this change provide the contractor more flexibility? Yes

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

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

None

Is this proposal needed for compliance with:

Federal or State regulations? Yes

AASHTO or other design code? Yes

Is this item editorial?

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

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT
203.25 EMBANKMENT WITHOUT DENSITY CONTROL

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 972, DELETE AND INSERT AS FOLLOWS:

203.25 Embankment Without Density Stiffness Control

When aggregate is used for embankment construction and has such a large top size as to make it impractical to perform ~~density~~stiffness tests, and if approved, such material ~~may~~shall be compacted with ~~several passes of~~ crawler-tread equipment or with approved vibratory equipment, or both. ~~The equipment weight shall be at least 10 t.~~ The materials shall be placed in lifts not to exceed 69 in. loose measurements, or as directed by the Engineer, ~~and each lift compacted thoroughly by successive trips back and forth with the tread areas overlapping enough on each trip so that all portions will be compacted uniformly.~~ Each lift shall be compacted with a minimum of five ~~roller~~ passes. The tread areas shall overlap enough on each trip so that the entire embankment is compacted uniformly. When the embankment reaches ~~a~~ 24 in. below the proposed subgrade elevation, ~~P~~, proofrolling shall be performed in accordance with 203.26. Proofrolling shall also be performed at every ~~five feet~~ 5 ft of the fill placed. Any defect shall be corrected as directed. Upon acceptance, a layer of geotextile in accordance with 918.02(a) Type 2B, shall be placed and the remaining embankment shall be constructed with No. 53 aggregate ~~No. 53 in accordance with 301. Geotextile will be measured in accordance with 616.12.~~

At locations inaccessible to the above compacting equipment, the required compaction shall be obtained with approved mechanical tamps or vibrators, in which case the depth of lifts, loose measurement, shall not exceed 4 in.

COMMENTS AND ACTION

203.25 EMBANKMENT WITHOUT DENSITY CONTROL

DISCUSSION:

Mr. Beeson introduced and presented this item stating that compaction with minimum weight and proof rolling will help in construction quality. Mr. Siddiki stated that specifying geotextile and aggregates will improve the quality of such embankments.

Mr. Koch inquired about striking the word "roller", and if 214 should be referenced with regard to geotextiles. Other minor edits are as shown.

Motion: Mr. Beeson Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u> </u> Passed as Submitted <u> X </u> Passed as Revised <u> </u> Withdrawn
Standard Specifications Sections referenced and/or affected: 203.25 pg 167.	<u> X </u> 2018 Standard Specifications <u> </u> Revise Pay Items List
Recurring Special Provision affected: NONE	<u> </u> Create RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Standard Drawing affected: NONE	<u> </u> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Design Manual Sections affected: NONE	<u> </u> Standard Drawing Effective
GIFE Sections cross-references: NONE	<u> </u> Create RPD (No. <u> </u>) Effective <u> </u> Letting <u> X </u> GIFE Update <u> </u> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Section 203.09 is used in construction of embankment and its foundation. There is not clear guidance for foundation improvement in the current specifications. When embankment is constructed with low plastic soils there is no guidance for encasement. All these problem cause delays and needs improvement in the specifications. Also, the proofrolling specifications need to be updated and clarified.

PROPOSED SOLUTION: Several paragraphs were rearranged or edited for the clear guidance to project personnel. Encasement guidelines were added if embankment is constructed with low plastic soils. Additional clarification was added to the proofrolling section.

APPLICABLE STANDARD SPECIFICATIONS: 203.09 and 203.26

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: None

PAY ITEMS AFFECTED: yes

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Construction , environmental ,geotechnical and District Testing Engineer

IMPACT ANALYSIS (attach report):

Submitted By: Matt Beeson for Geotechnical Services

Title: State Materials Engineer

Organization: OMM

Phone Number: 317-610-7251x204

Date: 02/20/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? Yes

Will approval of this item affect the Approved Materials List? None

Will this proposal improve:

Construction costs? None

Construction time? None

Customer satisfaction? Yes

Congestion/travel time? None

Ride quality? yes

Will this proposal reduce operational costs or maintenance effort? None

Will this item improve safety:

For motorists? None

For construction workers? None

Will this proposal improve quality for:

Construction procedures/processes? None

Asset preservation? None

Design process? None

Will this change provide the contractor more flexibility? Yes

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

Can this item improve/reduce the number of potential change orders?
None

Is this proposal needed for compliance with:

Federal or State regulations? None

AASHTO or other design code? None

Is this item editorial?

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

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT

203.09 GENERAL REQUIREMENTS

203.26 PROOFROLLING

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 243, DELETE AND INSERT AS FOLLOWS:

203.09 General Requirements

The excavation and embankments for the roadway, intersections, and entrances shall be finished to reasonably smooth and uniform surfaces. Excavated materials shall not be wasted without permission. Excavation operations shall be conducted so that material outside the limits of slopes will not be disturbed. Prior to beginning excavation, grading, ~~and~~ embankment operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with 201. ~~The area of the exposed materials shall be limited by the Contractor's capacity to adequately maintain permanent and temporary erosion and sediment control features.~~

~~The Engineer will direct the Contractor to~~ shall stabilize an area if the disturbed ground is anticipated to be left bare and unworked for seven consecutive calendar days. ~~Once or if directed, the Contractor shall stabilize the area within seven days.~~ The ~~methods~~ storm water management control features shall be installed in accordance with 205 or as otherwise directed. ~~The area of the exposed materials shall be limited by the Contractor's capacity to adequately maintain permanent and temporary storm water management control features.~~

~~All spongy and yielding material which does not readily compact, and all vegetation, shall be removed from within slope-stake limits and to such depths as directed. Soft or unstable materials which are encountered where the proposed embankment will be placed shall be removed. If groundwater is encountered, backfilling shall be accomplished using B borrow in accordance with 211.02 to an elevation at least 2 ft above the groundwater level. Compaction of the B borrow placed above the free water level shall be accomplished using heavy vibratory equipment. If groundwater is not encountered during the removal operation, the backfill shall be placed in accordance with the following paragraph. None of the removed materials shall be used in embankment, except if approved, they may be used if aerated such that proper compaction can be achieved.~~

Soils containing greater than 7% by dry weight organic material, or soils with a maximum dry density of less than 90 pcf shall not be incorporated in the embankment. Loss on ignition will be determined in accordance with AASHTO T 267, and density will be determined in accordance with AASHTO T 99.

~~After the embankment area has been cleared and before embankment is placed, all pronounced depressions left in the original ground shall be refilled with suitable material and compacted in accordance with 203. The upper 6 in. of the original ground shall be compacted with~~

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT

203.09 GENERAL REQUIREMENTS

203.26 PROOFROLLING

~~a roller weighing no less than 10 t, or with other approved compacting equipment. Proofrolling of the natural ground surface shall be performed in accordance with 203.26 within all areas where new fill will be placed.~~

~~If the original ground cannot be compacted to the required density because of unstable soils, high water table, or other conditions, the use of stabilizing materials consisting of B borrow in accordance with 211.02, or soils drying with a chemical modifier in accordance with 217 may be used. The materials shall be 1 to 2 ft thick, and shall be extended so as to daylight at the toe of slope. B borrow, when exposed, shall be capped with a geotextile and 6 in. of coarse aggregate No. 2 or riprap.~~

~~Prior to the use of B borrow, granular materials, or soils drying with a chemical modifier, a written approval is required. When preliminary exploration indicates the need to remove more than 4 ft or 250 cu yd of unsuitable material, approval is needed.~~

~~Frozen materials, stumps, roots, all or parts of trees, brush, weeds, sod, or other perishable materials shall not be incorporated in the embankment. Rocks greater than 6 in. in any dimension shall not be left within 6 in. of the finished subgrade. The original ground surface, or the surface of any lift in place shall not be frozen and shall be free of snow, ice, or mud.~~

~~Soils containing organic material greater than 76% by dry weight, or soils with a maximum dry density of less than 90 pcf shall not be incorporated in the embankment. Organic content will be determined in accordance with AASHTO T 267, and maximum dry density will be determined in accordance with AASHTO T 99.~~

~~Frozen materials, stumps, roots, all or parts of trees, brush, weeds, sod, or other perishable materials shall not be incorporated in the embankment. Rocks greater than 3 in. in any dimension shall not be left within 18 in. of the finished subgrade. The original ground surface, or the surface of any lift in place shall not be frozen and shall be free of snow, ice, or mud.~~

~~All vegetation, all spongy, yielding, soft, and unstable materials, which are encountered, shall be removed as indicated within the plans or as directed. Removed materials may only be used in embankment construction if they are constructed in accordance with 203.23.~~

~~After clearing of the embankment area and prior to embankment placement, all pronounced depressions left in the original ground shall be filled with suitable material and compacted in accordance with 203. Proofrolling of the natural ground surface shall be performed in accordance with 203.26 within all areas where new fill will shall be placed.~~

~~If the original ground cannot be compacted to the required strength because of soft or unstable soils, the use of stabilizing materials consisting of coarse aggregate No. 5 encapsulated~~

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT

203.09 GENERAL REQUIREMENTS

203.26 PROOFROLLING

in geotextile, in accordance with ~~211.02 and 918.02~~214.03(a), or soil drying with a chemical modifier in accordance with 217 shall be used as directed. The coarse aggregate materials used for stabilization shall be 1 to 2 ft thick and shall allow the encapsulated material in the embankment to drain.

When free water is encountered, backfilling shall be accomplished using B borrow, in accordance with 211.02, to an elevation at least 2 ft above the free water level. Compaction of the B borrow placed above the free water level shall be accomplished using heavy vibratory equipment.

The use of hydraulic methods to construct embankments will be allowed only when authorized in writing. Only B borrow shall be placed below the free water level. Backfill at structures shall be in accordance with 211.04.

The embankment shall be kept drained at all times by keeping the center higher than the sides and uniformly graded.

Each embankment lift shall extend transversely over the entire area and shall be kept smooth. ~~If a dragline or similar equipment deposits material~~When fill materials are deposited in large masses onto the embankment, the materials shall be spread out in uniform lifts. Rock or shale used for embankment construction shall be in accordance with 203.20.

~~*The use of hydraulic methods to construct embankments will be allowed only when authorized in writing. Only B borrow shall be placed below the free water level. Backfill at structures shall be in accordance with 211.04.*~~

~~*If the same or similar material is being used in the upper lifts of embankment as shall be used in the subbase at that location, these lifts shall be placed in smooth uniform layers for the full width of the embankment.*~~

When grading operations are performed in non-daylight hours, artificial lighting shall be provided and maintained, to enable the construction and inspection of the operations.

When the embankment soils are granular, silty loam, sandy loam, silts, or when the plasticity index of the material is less than 8, the embankment shall be encased with materials consisting of silty clay loam, clay loam, sandy clay loam, or silty clay of 12 in. minimum depth measured perpendicular to the face of the slope. The plasticity index for these materials shall be equal to or greater than 8 and the organic content shall not exceed 76%. The surface of any necessary encasement shall meet the finished slope limits ~~indicated within~~shown on the plans or as directed.

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT

203.09 GENERAL REQUIREMENTS

203.26 PROOFROLLING

All slopes, which are to be graded and not ~~immediately~~ stabilized with ~~other erosion~~ ~~storm water management~~ control measures, shall be roughened, as described herein, until ~~permanent erosion~~ ~~storm water management~~ control measures are placed. *The soil slopes shall be roughened to create a series of ridges and depressions parallel to the contour making grooves at least 1 in. deep and not more than 15 in. apart. Slopes shall be stabilized in accordance to 205.* Roughening shall take place each day after work is performed on the slopes, or as directed to re-establish the roughening.

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

Sufficient quantities of excavated materials suitable for the growth of vegetation shall be preserved from within the planned excavation area and used ~~for the encasement of~~ ~~on constructed~~ cut, fill, and shoulder slopes ~~which are deemed not suitable for to help develop~~ the growth of vegetation. ~~The depth of encasement shall be 6 in. or more, as directed.~~ *Materials suitable for vegetative growth shall be at least 6 in. deep or as indicated within the contract documents and shall be measured perpendicular to the face of the slope. Unless otherwise provided, No* additional compensation will be allowed for this work except payment will be made for the class of excavation involved for ~~authorizing~~ *authorized* undercutting of back slopes. Encasement of rock embankment and cut slopes will not be required unless otherwise directed.

Material suitable for the growth of vegetation shall be ~~as approved and may consist of~~ ~~sandy loam, sandy clay loam, clay loam, clay, and shall be free from clods, debris, and stones~~ *in accordance with 914.01 prior to placement.* The material placed on backslopes of cut sections shall be placed in accordance with 203.21.

If sufficient excavation materials suitable for the ~~encasement of~~ *growth of vegetation and used on constructed* cut, fill, and shoulder slopes are not available, borrow ~~or other material suitable for vegetative growth~~ shall be furnished. The sources of ~~the all~~ borrow material ~~for encasement~~ shall be in accordance with 203.08 and 914.01. Payment for borrow will be made in accordance with 203.28. If the contract does not contain a pay item for borrow, a change order will be executed for payment of borrow. Suitable portions of common excavation may be preserved or borrow material may be furnished for encasement provided all suitable excavation is used constructively.

SECTION 203, BEGIN LINE 985, DELETE AND INSERT AS FOLLOWS:

203.26 Proofrolling

When proofrolling is specified, the work shall be performed with an ~~pneumatic tire roller in accordance with 409.03(d)3. Other approved equipment such as a fully legally loaded tri-axle or tandem-highway dump truck with a minimum tire pressure of 90 psi, or a chariot style roller~~

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT

203.09 GENERAL REQUIREMENTS

203.26 PROOFROLLING

~~may be substituted for the pneumatic tire roller. There shall be one or two complete coverages as directed. Roller marks, irregularities, or failures shall be corrected.~~

Proofrolling for original ground or embankment construction shall be performed using equipment a dump truck weighing at least 15 t with a minimum tire pressure of 90 psi. Proofrolling for subgrade preparation shall be performed using equipment a dump truck weighing at least 33 t with a minimum tire pressure of 110 psi. Tire pressure shall be checked in the presence of the Engineer. All proofrolled surfaces shall be covered completely with a single pass. Operating speed of the proofrolling equipment truck shall not exceed 2 mph.

Deflections or rutting in excess of 1/2 in. shall require remediation of the surface as directed. Deflection or rutting in excess of 3 in. shall require corrective remediation measures and the Office of Geotechnical Services will be contacted. Proofrolling shall be performed after remediation measures on embankment or subgrade prior to the placement of additional material. There shall be one or two complete coverages as directed. Roller marks, irregularities, or failures shall be corrected.

COMMENTS AND ACTION

203.09 GENERAL REQUIREMENTS
203.26 PROOFROLLING

DISCUSSION:

This item was introduced by Mr. Beeson and presented by Mr. Siddiki who stated that several paragraphs in 203.09 were rearranged or edited in order to provide clear guidance to project personnel. Encasement guidelines were added for embankment constructed with low plastic soils. Additional clarification was also added to the proofrolling section. Further discussion ensued concerning the proofrolling equipment specified, and if those listed are feasible. Following much discussion, the revisions are as shown which incorporate the use of on-highway dump trucks, and tire pressure requirements.

Other editorial revisions, recommended by Mr. Koch and agreed to by Mr. Siddiki, are as shown.

Motion: Mr. Beeson Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u> </u> Passed as Submitted <u> X </u> Passed as Revised <u> </u> Withdrawn
Standard Specifications Sections referenced and/or affected: 203.09 pg 151 thru 153; 203.26 pg 168. Recurring Special Provision affected: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	<u> X </u> 2018 Standard Specifications <u> </u> Revise Pay Items List <u> </u> Create RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date: <u> </u> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date: <u> </u> Standard Drawing Effective <u> </u> Create RPD (No. <u> </u>) Effective <u> </u> Letting <u> X </u> GIFE Update <u> </u> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Full-depth reclamation is a cold recycling process performed in-place and is limited to a maximum recycling depth of 10". This process is limited in its ability to fully address subgrade stabilization.

PROPOSED SOLUTION: Cold central plant recycling, CCPR, is a new process that permits the complete recycling of HMA pavements and materials for use in new flexible pavement construction. The existing HMA pavement is milled and transported to a nearby location for stockpiling, crushing, screening and stabilization in preparation for transport back to the project for placement by a paver. Some projects could receive complete subgrade stabilization upon removal of existing HMA pavement.

APPLICABLE STANDARD SPECIFICATIONS: New Section

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: One new item

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Cold Recycling Committee comprised of Nathan Awwad, Kumar Dave, Jason Wielinski from HRG, Megan Yount from HRG and David Harness from Alt & Witzig.

IMPACT ANALYSIS (attach report): yes

Submitted By: Matthew Beeson

Title: State Materials Engineer

Organization: INDOT

Phone Number: 317-610-7251

Date: 01/23/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? No

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

Will this proposal improve:

Construction costs? Yes

Construction time? Yes

Customer satisfaction? Yes

Congestion/travel time? No

Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? Yes

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

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

Is this proposal needed for compliance with:

Federal or State regulations? N/A

AASHTO or other design code? N/A

Is this item editorial? No

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

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

The Standard Specifications are revised as follows:

SECTION XXX, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR

XXX.01 Description

This work, ~~Cold Central Plant Recycling, CCPR~~, shall consist of a mixture of sized Reclaimed Asphalt Pavement, RAP, millings from existing asphalt pavement or existing stockpiles, asphalt emulsion, water and other additives. The mixture shall be produced at a nearby location, then placed and compacted to produce a recycled asphalt layer to the approved design properties in accordance with 105.03.

XXX.02 Just-in-Time Training, JITT

The Engineer and Contractor are required to attend a just-in-time training, JITT, course regarding CCPR and both ~~must~~ shall mutually agree on the course instructor, course content and training site. The training class shall be conducted at a project field location convenient for all project construction personnel responsible for CCPR operations and inspection to attend.

The JITT course shall be held during normal working hours and be completed not more than 14 days prior to the start of CCPR operations.

The Contractor shall provide a JITT instructor experienced in the construction methods, materials and test methods associated with asphalt emulsion stabilized CCPR. A copy of the course syllabus, handouts and presentation materials shall be submitted to the Engineer at least 5-five business days before the course is to be taught.

XXX.03 Quality Control

A quality control plan, QCP, shall be submitted to the Engineer a minimum of ~~15~~ five calendar days prior to ~~beginning the CCPR operation~~ the JITT. The QCP shall include the proposed CCPR mix design, a start to finish process description to include discussion on corrective action measures, a list of proposed equipment, a list of proposed QC tests and testing frequencies, and the curing methods and procedures applied to the CCPR. All ~~Contractor's~~ QC test results shall be maintained during the duration of the contract and made available to the Engineer upon request.

The following table provides the type and minimum frequency for tests:

QC TESTING	
Test	Frequency ^{1,2}
Depth of Laydown	1 per 500 ft
Pulverized Material Gradation	1 per 1,000 tons of production
Pulverized Material Moisture Content	1 per 500 tons of production

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

Asphalt Emulsion Content ³	1 per 500 tons of production
Water Content ³	1 per 500 tons of production
Compacted In-Place Field Density	1 per 1,000 ft
Field Moisture Content for Curing ⁴	1 per each day of production
Note 1: The Contractor shall perform all quality control tests within the first 500 ft after startup or after any change in the mix design.	
Note 2: Testing frequency is based upon either linear feet of CCPR laydown or tons of CCPR mixture processing.	
Note 3: Asphalt emulsion content and water content shall be taken from the readings of the control settings of the mixing unit.	
Note 4: Locations will be determined by the Engineer.	

MATERIALS

XXX. 04 Materials

CCPR shall consist of a homogenous blend of RAP combined with asphalt emulsion, water, and when required, recycling additives such as corrective aggregate or cement. Cement recycling additives used in asphalt emulsion stabilized CCPR may be dry powder or slurry with a minimum dry solids content of 30%. The actual materials used are dependent on the CCPR mix design and project requirements.

Materials for use in CCPR shall be in accordance with the following:

Asphalt EmulsionAs Defined*

Corrective Aggregate to adjust gradation or supplement material volume:

1. Coarse or Dense Graded Aggregate, Class C or Higher904.03
2. Fine aggregate 904.02
3. RAP shall be the product resulting from the cold milling or crushing of existing asphalt pavement and processed so that 100% passes the 1 1/4 in. (31.5 mm) sieve.

Portland Cement, Type I901.01(b)

Water913.01

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

CCPR ASPHALT EMULSION ⁽¹⁾⁽³⁾			
Test	Procedure	Min.	Max.
Viscosity, Saybolt Furol, @ 77°F (25°C), SFS	AASHTO T 59	20	100
Sieve Test, No. 20 (850 µm), retained on sieve, %	AASHTO T 59		0.10
Storage Stability Test, 24 hr, %	AASHTO T 59		1
Distillation Test, Residue by distillation, %	AASHTO T 59 ⁽²⁾	64.0	

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

Oil Distillate by volume, %	AASHTO T 59		1
Penetration, 77°F (25°C), 100 g, 5 s, dmm	AASHTO T 49	50	200
Notes: (1) The asphalt emulsion shall be selected for the project by the asphalt emulsion supplier based on the Contractor's mixture design. The penetration of the supplied asphalt emulsion shall be within ± 25 dmm of the penetration of the design asphalt emulsion. The asphalt emulsion shall be received on the job site at a temperature no greater than 120°F. (2) Modified AASHTO T 59 – distillation temperature of $350 \pm 9^\circ\text{F}$ ($177 \pm 5^\circ\text{C}$) with a 20 minute hold. (3) Type A certification will shall be required to be furnished by the asphalt emulsion supplier.			

XXX.05 Mix Design

CCPR mix designs shall be in accordance with ITM 592 and comprised of existing RAP, asphalt emulsion and recycling additives, if necessary. The mix design and all associated testing shall be performed using samples of each proposed material. RAP samples shall either be collected from the existing pavement at the project site representing the milling depth or from the RAP stockpile to be used during construction. The mix design shall be completed by a design laboratory that is AMRL accredited in HMA and asphalt emulsion. Additional mix designs shall be performed when the proposed material changes significantly in order to establish representative mixes for the entire job. The Contractor shall be responsible for obtaining all samples required to develop the mix design. One sample per lane mile of planned CCPR shall be the minimum sampling frequency for mix design preparation.

The Contractor shall provide a mix design or designs for approval at least ~~15~~ five calendar days prior to ~~beginning the CCPR operation~~ the JITT. The mix design shall include all test results performed. If new materials are added, a new mix design, including the updated test results, shall be submitted at least one day prior to implementation.

CONSTRUCTION REQUIREMENTS

XXX.06 Roadway Preparation

Snowplowable raised pavement markers shall be removed prior to CCPR operations in accordance with 808.11(e).

Grass and other vegetation shall be removed from the edge of the existing pavement to prevent contamination of the pulverized asphalt material during milling operation.

All areas of soft or yielding subgrade shall be corrected prior to CCPR operations.

If the CCPR mix is to be placed on a prepared subgrade or aggregate base, ensure the subgrade soils and base have been properly prepared, moisture treated and compacted to the minimum density according to plans or specifications, immediately prior to placement of the CCPR mix, so as to create an evenly graded, unyielding surface.

XXX.07 Pavement Removal

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

The existing asphalt pavement shall be milled in accordance with 306 to the length, depth and width as shown on the plans or specifications. The RAP shall be free of contamination of dirt, base, concrete or other deleterious materials such as silt and clay.

When a paving fabric is encountered during the pulverization operation, the Contractor shall make the necessary changes in equipment or operations so that incorporation of shredded fabric into the CCPR does not affect the performance parameters or inhibit placement or compaction of the CCPR. The Contractor shall be required to remove and properly dispose of oversized pieces of paving fabric. The Contractor shall make the necessary adjustments in equipment or operations so that the shredded fabric in the recycled material is no more than 5 sq in. Additionally, ~~n~~No fabric piece shall have a dimension exceeding a length of 4 in.

Rubberized crack filler, durable pavement markings, loop wires and other non-pavement materials shall be removed as observed from the roadway. Residual materials that cannot be completely removed may be incorporated into the mixture if the Contractor can demonstrate that those added materials will not adversely affect performance.

Any such materials retained in the mix shall be appropriately sized and blended so as not to adversely affect the strength of the recycled pavement.

XXX.08 Equipment

The equipment shall consist of the following major components:

(a) Milling Machine/Pavement Cold Planer

Milling equipment shall be in accordance with 306.03(a). The equipment shall be capable of pulverizing the existing asphalt material in a single pass to the depth shown on the plans. The machine shall have automatic depth controls to maintain the cutting depth to within $\pm 1/4$ in. of that shown on the plans. The milling operation shall not disturb or damage the underlying material. The use of a heating device to soften the pavement will not be allowed.

(b) Additive Slurry Storage and Supply Equipment

Slurry shall be produced using a batch or continuous-flow type stationary mixer equipped with calibrated metering and feeding devices that introduce the cement, water and additives into the mixer in the specified quantities. Additive slurry storage and supply equipment shall have agitators or similar equipment to keep the slurry in suspension when held in the slurry batch or storage tanks. Slurry shall be kept in suspension during transport using agitator equipment.

(c) Sizing Equipment

A material sizing unit shall be capable of sizing using a scalping screen ~~and/or~~ crushing capabilities to reduce RAP to a maximum size of 1 1/4 in. (31.5 mm) or to the maximum size requirements specified prior to mixing with the asphalt emulsion.

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

(d) Mixing and Proportioning Equipment

The equipment shall be capable of processing sized RAP, asphalt emulsion, water and any additives stipulated in the mix design to a homogenous and uniformly coated CCPR mixture. The equipment shall be in accordance with 409.02(b) and display automatic digital readings shall be displayed for flow rate of both the RAP and asphalt emulsion in appropriate units of weight and time.

The mixing apparatus shall have cold feed hopper equipped with vibrators on the hopper's walls to assist the free flow of materials to a variable speed belt conveyor. Control of the RAP shall be by mechanically adjustable gate valves at the point of discharge or a RAP belt scale for the continuous weighing of the RAP. The variable speed belt conveyor ~~and/or~~ RAP belt scale shall be interlocked to the asphalt emulsion metering device.

The asphalt emulsion metering device shall be capable of automatically adjusting the flow of asphalt emulsion to compensate for any variation in the amount of RAP introduced into the mixing apparatus. Asphalt emulsion shall be metered by weight of RAP using a calibrated meter that will accurately measure the amount of asphalt emulsion to within a tolerance of $\pm 2.0\%$ of the specified rate.

(e) Hauling Equipment

Hauling equipment shall be in accordance with 409.03(b).

(f) Laydown Equipment

Laydown equipment shall be in accordance with 409.03(c).

The paver screed shall be controlled by electronic grade and cross-slope control. Heating of the screed shall not be ~~permitted~~ allowed.

CCPR material shall either be loaded directly into the paver hopper from transport trucks or loaded by a pickup device. If utilizing a pickup device, it shall be capable of removing and transferring the entire windrow of recycled mix in a single pass.

The equipment used for placement of the CCPR mixture shall be capable of the placement in accordance to 105.03.

(g) Compaction Equipment

Compaction equipment shall be in accordance with 409.03(d). The number, weight, and types of rollers shall be as necessary to obtain required compaction. At a minimum, the following rollers shall be used:

- 1. At least one pneumatic tired roller in accordance with 409.03(d)3 with a minimum weight of not less than 20 t.*
- 2. At least one double drum vibratory roller in accordance with 409.03(d)4 with a minimum weight of not less than 10 t.*

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

XXX.09 Weather Restrictions

The Engineer may restrict work when the weather is foggy or rainy. CCPR operations shall be performed when the RAP temperature, or pavement surface temperature, is above 50°F with overnight ambient temperatures above 35°F. Recycling may be performed during light precipitation so long as the Contractor can demonstrate that the performance of the CCPR pavement will not be adversely affected. The Engineer may restrict work when the heat index is greater than 100°F. The CCPR shall not be performed before May 1st or after October 1st.

XXX.10 Material Sizing and Stockpiling

The gradation of the RAP shall have 100% passing the 1 1/4 in. (31.5 mm) sieve, or be sized to meet specific contract requirements.

RAP that has been crushed and screened shall be stockpiled and maintained to prevent reconsolidation. Water may be added to RAP as it is screened and crushed to abate dust and mitigate reconsolidation.

Corrective aggregate, if required, shall either be mixed with RAP to create a homogenous mixture during stockpiling or fed into the mixing apparatus at the rate determined by the mix design.

XXX.11 Processing and Mixing Operation

The sized RAP shall be processed through a mixing unit capable of combining the sized RAP, asphalt emulsion, and any additives to produce a homogenous recycled mixture.

An additive used in asphalt emulsion stabilized CCPR may be dry powder or slurry and the Contractor shall address the application methods and fugitive dust control procedures in the QCP when dry powder materials are used.

The asphalt emulsion shall be injected into the CCPR materials at the initial rate determined by the mix design and approved by the Engineer. Sampling and mix design may determine different levels of asphalt emulsion at various portions of the project.

The asphalt emulsion shall have an application tolerance determined by adding $\pm 0.25\%$ to the percent total asphalt emulsion content.

The Contractor can request the asphalt emulsion percentage to exceed the upper tolerance provided the mix design requirements are satisfied at the requested percentage. The request will be subject to approval by the Engineer.

XXX.12 Placement

The depth of CCPR shall be as indicated on the plans.

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

The hauling equipment shall deliver the blended CCPR material into the paver within $\pm$ one hour of mixing or before the asphalt emulsion begins to break and set.

CCPR single lift thickness ~~should~~ shall be a minimum compacted depth of 3 in. (~~75 mm~~) and not exceed a maximum compacted depth of 6 in. (~~150 mm~~). A minimum lift thickness of 2 in. (~~50 mm~~) can be utilized if the crushed RAP has a maximum size of 1 in. (~~25 mm~~).

XXX.13 Control Strip and Compaction

A minimum 500 ft long control strip shall be conducted the first day of production to verify the construction process meets the requirements as specified. The control strip shall allow the Contractor to:

- (a) demonstrate the equipment, materials and processes proposed to produce a CCPR layer in accordance with specification requirements, and;*
- (b) determine the optimal rates for the asphalt emulsion, water and any additives recommended for the material, and;*
- (c) determine the sequence and manner of rolling necessary to obtain specified density requirements in one uniformly compacted layer.*

The CCPR density shall be achieved with the same equipment, materials, construction methods and density requirements used on the accepted control strip. A new control strip shall be constructed if changes are made outside of the tolerances of the original mix design, equipment or construction methods.

A rolling pattern that produces the maximum obtainable density, or optimum field density, shall be determined during the control strip. The Contractor shall provide a sequence and manner of rolling by establishing a roller pass versus density chart that shows the progress of densification from initial lay down through optimum field density using a properly calibrated nuclear gauge in accordance to AASHTO T 310. Production may continue after approval of the control strip.

The Contractor shall perform compaction testing in accordance with AASHTO T 310 during production to ensure compaction is between 97% and 102% of the optimum field density established during the control strip. If two successive tests indicate compaction is over 102% or below 97% of the optimum field density, a new rolling pattern and roller pass versus density chart shall be established.

The technician shall be on site, observing all compaction efforts and approving areas as they reach minimum relative compaction. Care shall be taken not to over compact the mat.

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

Any type of rolling effort that causes cracking, displacement or other type of pavement distress shall be discontinued until such time as the problem can be resolved and approved by the Engineer.

Rollers shall not be started or stopped on recycled material unless when changing direction during the compaction process.

All tests shall be conducted at the stated QC testing frequencies throughout CCPR operations.

XXX.14 Opening to Traffic

Opening to traffic shall be at the discretion of the Contractor after sufficient cure time has been applied to the CCPR so traffic will not initiate raveling or permanent deformation. All loose particles that may develop on the pavement surface shall be removed by a rotary power broom in accordance with 409.

After opening to traffic, the surface of the recycled pavement shall be maintained in a condition suitable for the safe movement of traffic.

XXX.15 Maintenance

The Contractor shall maintain the recycled pavement in a manner satisfactory to the Engineer until the surface course has been constructed.

Any damage to the completed recycled material shall be repaired by the Contractor prior to the placement of new asphalt concrete or final surface sealing. Patching shall be in accordance with 304. The excavated patch areas shall be filled and compacted with HMA or CCPR material as directed by the Engineer. No direct payment will be made for damage repair unless approved by the Engineer.

XXX.16 Curing

Before placing the final surfacing, the recycled surface shall remain in-place for a minimum of 3three days and meet one of the following conditions:

- (a) There is less than 3.0% moisture remaining in the mixture, or;*
- (b) The material has remained in-place for a minimum of 10 days without rainfall.*

The planned method and duration of curing for CCPR shall be in accordance with the QCP. The specified surface course shall be placed within two weeks of the pavement final cure, but no later than November 1.

XXX.17 Pavement Smoothness

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

Pavement smoothness of the cured CCPR mat shall meet the requirements of 401.18(b) The Contractor shall correct humps or depressions exceeding the tolerances in accordance with 401.18(c).

XXX.18 CCPR Surface Course

The CCPR shall be swept of all loose material and standing water with a rotary power broom in accordance with 409 immediately prior to placing the tack coat. A tack coat shall be required and shall be applied to the CCPR in accordance with 406.

Monuments shall be reestablished in accordance with 615.10 after the surface course is placed.

XXX.19 Method of Measurement

The CCPR will be measured by the square yard, complete in place. Asphalt emulsion will be measured by the ton in accordance with 109.05(b). Subgrade treatment will be measured in accordance with 207.05. Aggregate to adjust the CCPR gradation will be measured by the ton of material used. HMA Patching will be measured in accordance with 304.06. Re-established monuments will be measured by the number of units installed in accordance with 615.13. Grade adjustment of existing structures will be measured in accordance with 720.06. Removal of snowplowable raised pavement markers will be measured in accordance with 808.12.

XXX.20 Basis of Payment

The CCPR will be paid for at the contract unit price per square yard, complete in place. Asphalt emulsion will be paid for at the contract unit price per ton, complete in place. Subgrade treatment will be paid for in accordance with 207.06. Aggregate used to adjust the CCPR gradation will be paid for at the contract unit price per ton, complete in place. HMA patching will be paid for in accordance with 304.07, of the thickness specified on the plans. Re-established monuments will be paid for at the contract unit price per each complete in place in accordance with 615.14. Grade adjustment of existing structures will be paid for at the contract unit price in accordance with 720.07. Removal of snowplowable raised pavement markers will be paid for in accordance with 808.13.

Payment will be made under:

Pay Item

Pay Unit Symbol

Cold Central Plant Recycling, ~~CCPR~~ SYS
Corrective Aggregate, CCPR..... TON
Stabilizing Material, Asphalt Emulsion TON

The costs associated with the CCPR mix design and quality control testing shall be included in the cost of the ~~CCPR~~ cold central plant recycling.

REVISION TO STANDARD SPECIFICATIONS

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR (PROPOSED NEW, DRAFT)

The costs associated with the removal of grass and vegetation, rubberized crack filler, durable pavement markings, loop wires and other non-pavement materials shall be included in the cost of the cold central plant recycling.

The costs associated with ~~removal of grass and vegetation~~, pulverizing, stabilizing, compacting, curing and maintenance of the CCPR not related to failing subgrade shall be included in the cost of the ~~CCPR~~ cold central plant recycling.

The cost associated with mixing water for cold central plant material shall be included in the cost of the ~~CCPR~~ cold central plant recycling ~~material~~.

The cost associated with aggregate when used to supplement material volume shall be included in the cost of the ~~CCPR~~ cold central plant recycling.

The cost associated with the use of portland cement when used as an additive shall be included in the cost of the cold central plant recycling.

The cost associated with aggregate when used to adjust the CCPR gradation shall be included in the cost of the corrective aggregate pay item.

The costs of the asphalt emulsion stabilizing material shall be included in the cost of the stabilizing material pay item.

In the locations of failing subgrade, removal of the CCPR shall be included in the cost of subgrade treatment.

COMMENTS AND ACTION

SECTION XXX - COLD CENTRAL PLANT RECYCLING, CCPR

DISCUSSION:

This item was introduced and presented by Mr. Beeson who explained that cold central plant recycling, CCPR, is a new process that allows the complete recycling of HMA pavements and materials for use in new flexible pavement construction. The existing HMA pavement is milled and transported to a nearby location for stockpiling, crushing, screening and stabilization in preparation for transport back to the project for placement by a paver. Some projects could receive complete subgrade stabilization upon removal of existing HMA pavement.

Editorial revisions, following much discussion, are as shown.

Motion: Mr. Beeson Second: Mr. Boruff Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u> </u> Passed as Submitted <u> X </u> Passed as Revised <u> </u> Withdrawn
Standard Specifications Sections referenced and/or affected: PROPOSED NEW	<u> </u> 2018 Standard Specifications <u> X </u> Revise Pay Items List
Recurring Special Provision affected: NONE	<u> X </u> Create RSP (No.417-R-655) Effective May 01, 2017 Letting RSP Sunset Date:
Standard Drawing affected: NONE	<u> </u> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Design Manual Sections affected: NONE	<u> </u> Standard Drawing Effective
GIFE Sections cross-references: NONE	<u> </u> Create RPD (No. <u> </u>) Effective <u> </u> Letting <u> </u> GIFE Update <u> X </u> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

203.20(a): Rock embankment caused settlement in recent projects which are due the following: use of large rock slabs in embankment, roller passes, proofrolling and rutting limit, use of well compacted coarse aggregates.

203.20(b): Shale and soft rock do not specify the following: when shale is neither broken up nor slaked, swelling or settlement caused in shale embankment. Moisture requirements.

203.20(c): Settlement or slope failure were noticed, large rock and shale pieces, placement guidelines are not adequate.

203.21: Settlement and slope failure were noticed. Lack of benches. Improving drainage. Proof rolling, Constructing with coarse aggregates.

PROPOSED SOLUTION: Reducing rock size, specifying roller passes, proof rolling and deflection limit, shale slaking, Improving drainage, and constructing with coarse aggregate and develop uniformity

APPLICABLE STANDARD SPECIFICATIONS: yes

APPLICABLE STANDARD DRAWINGS: No

APPLICABLE DESIGN MANUAL SECTION: Yes

APPLICABLE SECTION OF GIFE: Yes

APPLICABLE RECURRING SPECIAL PROVISIONS: No

PAY ITEMS AFFECTED: No

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Contractors, geotechnical consultants and INDOT engineers reviews and comments were incorporated.

IMPACT ANALYSIS (attach report):

Submitted By: Matt Beeson for Nayyar Siddiki

Title: State Materials Engineer for Geotechnical Engineer

Organization: INDOT

Phone Number: 317-610-7251x204

Date: 02/20/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? yes

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

Will this proposal improve:

Construction costs? yes

Construction time? yes

Customer satisfaction? yes

Congestion/travel time? Yes

Ride quality? yes

Will this proposal reduce operational costs or maintenance effort? yes

Will this item improve safety:

For motorists? yes

For construction workers? yes

Will this proposal improve quality for:

Construction procedures/processes? yes

Asset preservation? Yes

Design process? Yes

Will this change provide the contractor more flexibility? Yes

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

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

Is this proposal needed for compliance with:

Federal or State regulations?

AASHTO or other design code?

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: Specs revision would help rock and shale embankment , improve the drainage and reduce the slope failures.

REVISION TO STANDARD SPECIFICATIONS

SECTION 23 - EXCAVATION AND EMBANKMENT

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 712, DELETE AND INSERT AS FOLLOWS:

203.20 Rock and Shale Embankment

Utilization of these materials in embankment construction shall be in accordance with the following.

(a) Rock Embankment

Where rock is used for embankment, no large stones shall be allowed to nest but shall be distributed over the area to avoid pockets. Voids shall be filled carefully with small stones. ~~The final 2 ft of the embankment just below the subgrade elevation shall be composed of suitable material placed in layers not exceeding 8 in. loose measurement and compacted to the required density.~~ Rock, sandstone, Sshale or shale-like materials shall not be incorporated in the upper 2 ~~ft~~24 in. of the embankment. *Proofrolling in accordance with 203.26 shall be performed to cover the entire grade for every 5 ft of the fill when the top size of the rock exceeds 2 in. Any rut greater than 1/2 in. shall be corrected as directed. Coarse aggregate No. 53 shall be used to construct the remaining embankment in accordance with 301. A geotextile in accordance with 918.02 shall be placed between the rock and the coarse aggregate No. 53.*

Where the depth of an embankment exceeds ~~5~~10 ft and is to consist entirely of rock, the rock shall be deposited in lifts not to exceed the top size of the material being placed, but in no event exceeding. ~~4 ft~~36 in. The rock for any particular lift shall be deposited on and pushed over the end of the lift being constructed by means of bulldozers or other approved equipment. Depositing of rock over the end of any lift from hauling equipment will not be allowed. If the voids of the last lift are not closed sufficiently, they shall be choked with small broken stone or other suitable material and compacted as directed. ~~A geotextile in accordance with 918.02 shall be placed between the rock and the soil.~~

Where the depth of embankment is ~~5~~10 ft or less, or where the material being placed does not consist entirely of rock, the material shall be placed in lifts not to exceed the top size of the rock being placed but not exceeding ~~2 ft~~12 in. Each layer shall be choked thoroughly with broken stone or other suitable material and be compacted to the required ~~density or as directed~~stiffness in accordance with 203.24. ~~A geotextile in accordance with 918.02 shall be placed between the rock and the soil.~~

Rock shall be compacted with a minimum eight passes of a smooth or large plates vibratory drum roller having a minimum effective weight of 10 t.

When embankment consists of rock and other suitable material, the following guidelines shall be followed:

REVISION TO STANDARD SPECIFICATIONS

SECTION 23 - EXCAVATION AND EMBANKMENT

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

1. *Rock shall be used at the foundation level in new embankment construction. A layer of geotextile shall be placed when other material is finer than rock.*
2. *Rock shall be used beyond the 2:1 slope or as directed and larger pieces shall be used outside the side slope.*
3. *Other embankment material as specified in 203.09 shall be used within a 2:1 slope of the embankment in accordance with 203.23.*
4. *The top 24 in. of rock, shale and sandstone embankment shall be constructed with coarse aggregate No. 53 in accordance with 301.*
5. *A geotextile in accordance with 918.02(a), Type 2A shall be placed between the rock and the other embankment material when finer material is on top of the rock embankment. Geotextile shall be measured in accordance with 616.11.*
6. *Where a rock fill is constructed over other embankment, the center to edge of the embankment slope shall be at least 4%. The embankment shall be allowed to drained.*

Where a rock fill is to be placed over a structure, the structure shall first be covered with 2 to 4 ft 24 to 48 in. of earth borrow or other approved material, and properly compacted before the rock is placed. This covering shall be placed in accordance with 203.19.

~~Shale shall not be incorporated as rock embankment unless written permission is obtained.~~

(b) Shale, Sandstone, Shale and Soft Rock or its Mixtures, or Soft Rock

When these materials are encountered and are to be used for embankment construction, the compaction shall be accomplished with an approved vibratory tamping-foot roller in conjunction with a static tamping-foot roller. The minimum weight for the static tamping-foot roller shall be 30 t. The minimum total compactive effort for the vibratory tamping-foot roller shall be 27.5 t. Total compactive effort is defined as that portion of the static weight acting upon the unsprung compaction drum added to the centrifugal force provided by that drum. If the manufacturer's charts do not list the static weight acting on the compaction drum, the roller shall be satisfactorily weighed, the weight shall be added to the centrifugal force, and the roller rated in accordance with the Construction Industry Manufacturers Association, CIMA. Each tamping foot on the static roller shall project from the drum a minimum of 6 in. Each tamping-foot on the vibratory tamping-foot roller shall project from the drum a minimum of 4 in. The surface area of the end of each foot on both tamping-foot rollers shall be no less than 5 1/2 sq. in.

REVISION TO STANDARD SPECIFICATIONS

SECTION 23 - EXCAVATION AND EMBANKMENT

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

Shale, ~~shale and soft rock or its mixtures, or soft rock~~ shall be placed in 8 in. maximum loose lifts. Strength and moisture control for compacted soils shall be in accordance with 203.23 ~~or the density shall be at least 95% of maximum dry density with moisture control in accordance with 203.23.~~ Excavation and blasting procedures shall accommodate the selective placement of these materials and avoid intermixing rock. Rock shall be placed in accordance with 203.20(a).

Water shall be applied to the shale in the cut to accelerate the slaking action and again prior to disking and compaction to facilitate the compaction. The water shall be distributed by an approved method which provides uniform application of the required quantity of water. The water shall be uniformly incorporated throughout the entire lift by a multiple gang disk with a minimum disk wheel diameter of 24 in. *During shale slaking, moisture content shall be at least 2% above optimum moisture content.*

Unless otherwise approved in writing, each embankment lift shall receive a minimum of three passes with the static roller and a minimum of two passes with the vibratory roller. The material shall be bladed before using the vibratory tamping-foot roller. A pass shall be in accordance with 402.15. The rollers shall not exceed 3 mph during these passes. The number of passes will be adjusted upward if necessary to meet the requirements of 203.23. *A moisture content test will be performed every two hours as a minimum or as directed. The top 24 in. shall be aggregate No. 53 and shall be placed in accordance with 301 after performing the proofrolling of the entire grade. Deflection or ruts greater than 1/2 in. shall be corrected as directed.* No additional compensation will be allowed for additional passes as specified herein, the cost of which shall be included in the cost of the pay items.

Water required to facilitate the slaking and compaction of the shale or soft rock will be measured in accordance with 203.27(h) and paid for in accordance with 203.28. *Aggregate No. 53 will be measured and paid for in accordance with 301.* No payment will be allowed for any water required for compaction of material furnished as borrow.

(c) Shale and Thinly Layered Limestone

In Dearborn, Decatur, Fayette, Franklin, Jefferson, Ohio, Ripley, Rush, Switzerland, Union, and Wayne Counties specifically, or in other areas where relatively thin layered shale and rock are encountered, their use will be allowed in the construction of embankment, if the following provisions, in addition to those stated in 203.20(b), are observed.

1. The slopes shall be encased with a minimum of 10 ft of relatively impervious, non-shale, non-erodible material.
2. The maximum size of limestone in the mixture shall be 6 in. in thickness and 1.5 ft in any other dimension.

REVISION TO STANDARD SPECIFICATIONS

SECTION 23 - EXCAVATION AND EMBANKMENT

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

3. The minimum number of passes with static roller and the vibratory tamping-foot roller shall be six static and two vibratory.

The top size of material shall not be greater than the lift thickness. If the material is found to be too intermixed with limestone fragments to enable strength field density tests as required in this section, this requirement may be waived by written permission. As an alternate to this requirement, proofrolling shall be performed at every four lifts, and the moisture content will be controlled on clayey soils in accordance with 203.235 ft in accordance with 203.26 and maximum deflection or ruts greater than 1/2 in. shall be corrected as directed.

While placing the material, shale dominated mixture shall be placed within a 2:1 slope of the embankment and coarser material at the outside 2:1 of the embankment. When required, a 12 to 24 in. thick aggregates No. 5 or No. 2 wrapped in geotextile in accordance 918.02 with 214.03, shall be constructed as a drainage mattressblanket prior to placement of shale and rock fill. During construction, efforts shall be made not to trap the water by constructing a geotextile wrapped aggregate mattress. The top 24 in. of the embankment shall be aggregate No. 53 and placed in accordance with 301 after performing the proofrolling of the entire grade. Geotextile will be measured and paid for in accordance with 616.12 and 616.13, respectively.

Moisture content shall be controlled on clayey soils in accordance with 203.23.

203.21 Embankment on Hillsides or Slopes

Before an embankment is placed on natural soil slopes or existing fill slopes of 4:1 or flatter, the existing ground surfaces shall be plowed or deeply scarified or, if the nature of the ground indicates greater precautions should be taken for integrating the proposed fill materials with the existing slopes, benches shall be cut into the existing slopes before fill placement is started. All such precautionary work shall be done as directed. No direct payment will be made for plowing or scarifying, the cost thereof to be included in the various pay items of the contract. Before an embankment is placed on natural soil slopes or existing fill slopes steeper than 46:1, benches a minimum of 10 ft wide, unless otherwise specified, shall be cut into the slopes prior to the placement of embankment fill. If benches are cut, the excavation involved will be paid for at the contract unit price per cubic yard for the class or classes of excavation encountered. *When water is seeping out of benches, the Office of Geotechnical Services shall be contacted for additional direction.*

When directed, a 12 to 24 in. thick layer of coarse aggregates No. 2 or No. 5 wrapped in geotextile in accordance 918.02, Type 2A with 214.03 shall be constructed prior to placement of shale and rock fill. During construction, efforts shall be made not to trap the water. Geotextile wrapped aggregate shall be either day lighted or drained into a ditch. The top 24 in. shall be aggregate No. 53 and placed in accordance with 301 after performing the proofrolling of the entire

REVISION TO STANDARD SPECIFICATIONS

SECTION 23 - EXCAVATION AND EMBANKMENT

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

grade. Deflection or ruts greater than 1/2 in. shall be corrected as directed. Geotextile shall be in accordance with 616.

APPROVED MINUTES

COMMENTS AND ACTION

203.20 ROCK AND SHALE EMBANKMENT

203.21 EMBANKMENT ON HILLSIDES OR SLOPES

DISCUSSION:

Mr. Beeson introduced and presented this item proposing to revise 203.20 and 203.21 in an effort to improve rock and shale embankments, improve drainage and reduce slope failure. The revisions shown include reducing rock size, specifying roller passes, proof rolling and deflection limits, shale slaking, drainage improvements, constructing embankments with coarse aggregate, and developing uniformity.

Pending additional comments and further review, this item has been withdrawn.

Motion: Mr. Beeson Second: Mr. Ayes: Nays: FHWA Approval:	Action: ____ Passed as Submitted ____ Passed as Revised <u> X </u> Withdrawn
Standard Specifications Sections referenced and/or affected: 203.20 pg 161 thru 163 and 203.21 pg 163. Recurring Special Provision affected: NONE	____ 2018 Standard Specifications ____ Revise Pay Items List ____ Create RSP (No. ____) Effective ____ Letting RSP Sunset Date:
Standard Drawing affected: NONE	____ Revise RSP (No. ____) Effective ____ Letting RSP Sunset Date:
Design Manual Sections affected: NONE	____ Standard Drawing Effective
GIFE Sections cross-references: NONE	____ Create RPD (No. ____) Effective ____ Letting ____ GIFE Update ____ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The *Indiana Design Manual* includes guidance limiting the projection of the stay-in-place (SIP) metal deck form support angles to ½" above the connection plate. This approach was used to reduce the likelihood of a crack propagating through the deck.

Design of SIP forms takes into account the clear span and deck thickness and yields a resultant uniform load to be used to select the deck angle supports and weld spacing. This selection is made knowing the section properties of the angle.

The enforcement of the projection limits has undesirably led to the angle being field cut, thus modifying the properties of the angle. While the modifications can be overcome with closer weld spacing, field personnel must record and relay the amount cut from each support between several beams and overall several spans. For precast beams, the angle is cast into the beam at the spacing required for the expected load.

PROPOSED SOLUTION: Create an RSP to limit the angle leg projection relative to the SIP form pan. Revise deflection requirements to align with AASHTO guidance.

APPLICABLE STANDARD SPECIFICATIONS: 702

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 404-2.02(02), 2.02(03), 2.03(02)

APPLICABLE SECTION OF GIFE: 5.10 FORMS FOR CONCRETE

APPLICABLE RECURRING SPECIAL PROVISIONS: No existing RSP's are effected

PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ASCE-INDOT Structures Committee

IMPACT ANALYSIS (attach report): yes

Submitted By: Elizabeth Phillips

Title: Standards and Policy Manager

Organization: Bridges Division

Phone Number: 317-232-6775

Date: 02/22/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? No

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

Will this proposal improve:

Construction costs? No

Construction time? Yes because contractors will know the exact requirements the SIP forms will be held to and not have to make modifications in the field

Customer satisfaction? Yes because limiting the vertically leg height reduces the chance of longitudinal cracking in the bridge deck.

Congestion/travel time? No

Ride quality? Yes because limiting the vertically leg height reduces the chance of longitudinal cracking in the bridge deck.

Will this proposal reduce operational costs or maintenance effort? Yes, less bridge deck cracks means less deck patching for INDOT maintenance crews

Will this item improve safety:

For motorists? In the long term, less deck cracks results in less potholes and therefore a safer riding surface

For construction workers? There should no longer be flame cutting of these angles in the field which is a safety concern because the cutting reduces the capacity of these angles.

Will this proposal improve quality for:

Construction procedures/processes? YES,
see above

Asset preservation? Yes

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

Design process? Yes, the design manual changes clarify the designers responsibilities related to SIP forms.

Will this change provide the contractor more flexibility? Yes, currently the contractor is held to the requirement of angle legs not extending more than ½" above the top of flange when detailed in the plans by the designers. Now the contractor will know the requirements and they will be the same for every project.

Will this proposal provide clarification for the Contractor and field personnel? Yes, the RSP and the GIFE updates will clarify the issue.

Can this item improve/reduce the number of potential change orders? Potentially, if CO's are happening to include the vertical angle leg requirements after letting.

Is this proposal needed for compliance with:

Federal or State regulations? no

AASHTO or other design code? The proposed changes bring INDOT standards in line with AASHTO formwork code.

Is this item editorial? no

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

REVISION TO SPECIAL PROVISIONS

702-X-XXX PERMANENT DECK FORM ANGLES (PROPOSED NEW, DRAFT)

702-X-XXX PERMANENT DECK FORM ANGLES

(Adopted xx-xx-17)

The Standard Specifications are revised as follows:

SECTION 702, BEGIN LINE 657, INSERT AS FOLLOWS:

Form sheets shall not rest directly on the top of the beam flanges. Sheets shall be securely fastened to *the* form supports and shall have a minimum bearing length of 1 in. at each end. All attachments shall be made by welds, bolts, clips, or other approved means. Except as amended by these specifications, welding and welds shall be in accordance with the requirements of 711.32 pertaining to fillet welds. However, 1/8 in. fillet welds will be allowed. *The vertical leg of angles used as form supports shall not extend higher than the top of the permanent metal form.*

BACKUP 01

IDM 404-2.03(02) PERMANENT METAL FORMS (REVISION DRAFT)

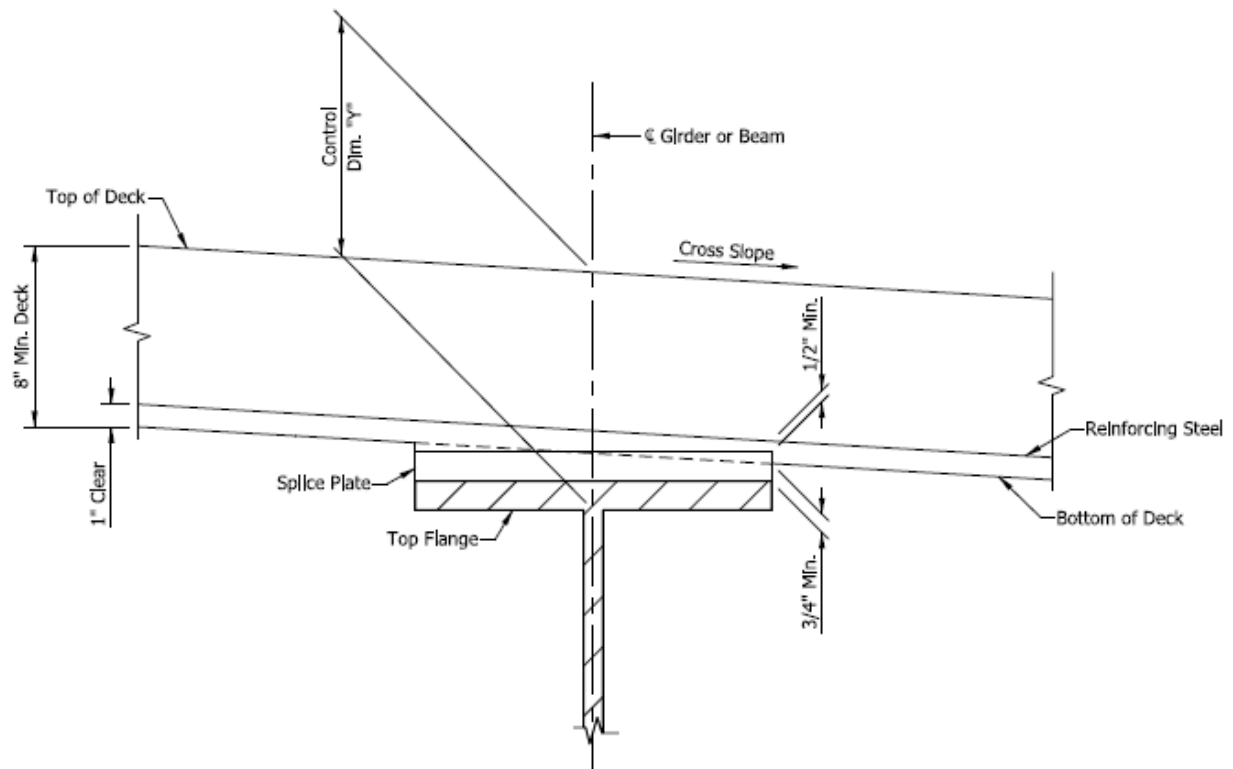
FIGURE 404-2B FILLET DIMENSIONS FOR STEEL BEAM

FIGURE 404-2C FILLET DIMENSION FOR PRE-STRESSED BEAMS

404-2.03(02) Permanent Metal Forms [Rev. May 2013, Rev. Mar. 2017]

Metal stay-in-place forms may be used to support the deck between beams.

Design of permanent metal forms is the responsibility of the contractor in accordance with INDOT *Standard Specifications* section 702. Designers should account for the use of forms as described in Chapter 403-2.03.



FILLET DIMENSIONS FOR STEEL BEAM

Figure 404-2B

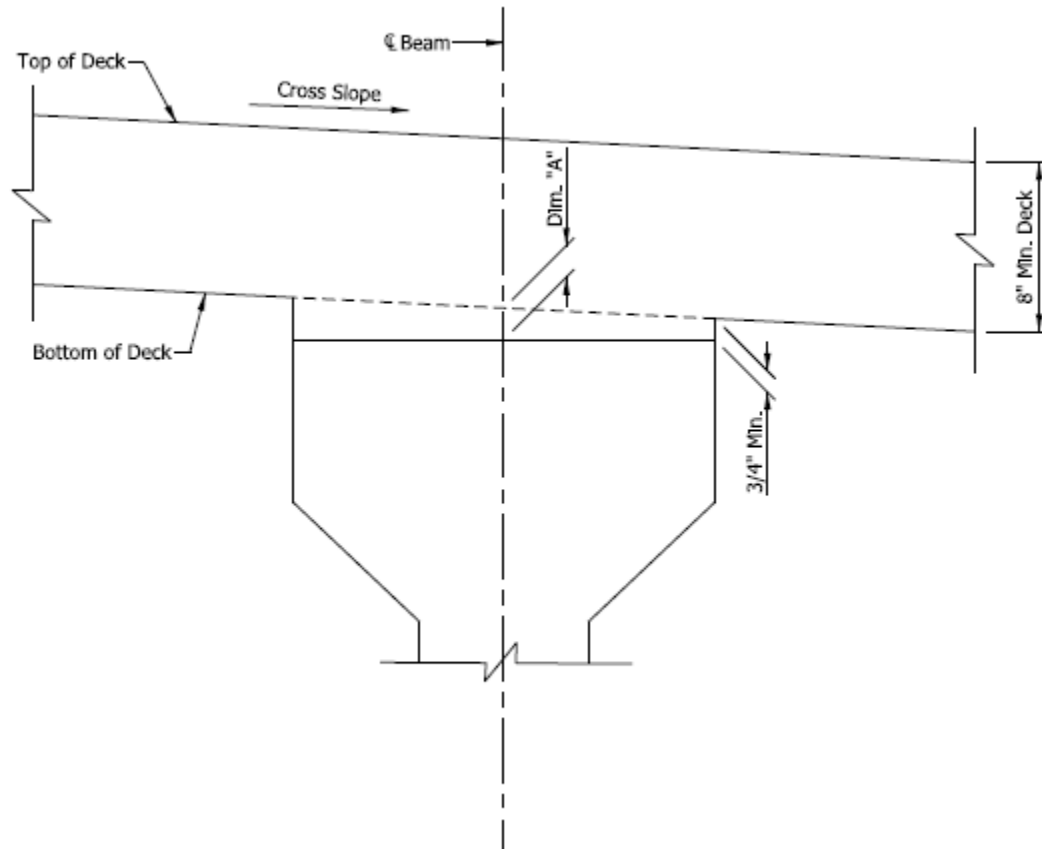
(CONTINUED)

BACKUP 01

IDM 404-2.03(02) PERMANENT METAL FORMS (REVISION DRAFT)

FIGURE 404-2B FILLET DIMENSIONS FOR STEEL BEAM

FIGURE 404-2C FILLET DIMENSION FOR PRE-STRESSED BEAMS



FILLET DIMENSION FOR PRE-STRESSED BEAMS

APPIN

COMMENTS AND ACTION

702-X-XXX PERMANENT DECK FORM ANGLES

DISCUSSION:

Mr. Orton, sitting in for Ms. Phillips, introduced this item stating the intention to create an RSP to limit the angle leg projection relative to the SIP form pan, and to revise the deflection requirements to be in accordance with AASHTO guidance. Ms. Wagner provided further clarification of the proposed revisions.

Motion: Mr. Orton Second: Mr. Beeson Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u>X</u> Passed as Submitted <u> </u> Passed as Revised <u> </u> Withdrawn
Standard Specifications Sections referenced and/or affected: 702.13 pg 531.	<u>X</u> 2020 Standard Specifications <u> </u> Revise Pay Items List
Recurring Special Provision affected: PROPOSED NEW	<u>X</u> Create RSP (No.702-B-304) Effective <u>July 01, 2017</u> Letting RSP Sunset Date: <u>2020 SS book</u>
Standard Drawing affected: NONE	<u> </u> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date: <u> </u>
Design Manual Sections affected: 404-2.02(02), 2.02(03), 2.03(02)	<u> </u> Standard Drawing Effective
GIFE Sections cross-references: 5.10 FORMS FOR CONCRETE	<u> </u> Create RPD (No. <u> </u>) Effective <u> </u> Letting <u>X</u> GIFE Update <u> </u> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Revisions to the Work Zone Added Penalty RSP were approved in May 2015. At the request of Design, correcting the basis of payment for Work Zone Added Penalty signs (from Type C to Type A) was delayed.

PROPOSED SOLUTION: Revise pay item to Construction Sign, Type C

APPLICABLE STANDARD SPECIFICATIONS: 801 (no changes)

APPLICABLE STANDARD DRAWINGS: 801-TCSN (no changes)

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: 801-R-542

PAY ITEMS AFFECTED: no new pay items

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc. Elizabeth Phillips, Dave Boruff

IMPACT ANALYSIS (attach report): yes

Submitted By: Elizabeth Phillips

Title: Standards and Policy Manager

Organization: Bridges Division

Phone Number: 317-232-6775

Date: 2/22/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? no

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

Construction costs? no

Construction time? no

Customer satisfaction? yes

Congestion/travel time? no

Ride quality? no

Will this proposal reduce operational costs or maintenance effort? no
Will this item improve safety:

For motorists? no

For construction workers? no

Will this proposal improve quality for:

Construction procedures/processes? no

Asset preservation? no

Design process? no

Will this change provide the contractor more flexibility? no

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

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

Is this proposal needed for compliance with:

Federal or State regulations? no

AASHTO or other design code? no

Is this item editorial? yes - but because of the impact to pay items is being brought for approval

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

REVISION TO SPECIAL PROVISIONS

801-R-542 WORKSITE ADDED PENALTY SIGNS

(Note: Basis for Use: Required for all contracts with **801-03290**, *Construction Sign, Type C* pay item.)

801-R-542 WORKSITE ADDED PENALTY SIGNS

(Revised 05-21-15)

Worksite Added Penalty signs shall be placed as shown on the plans or as directed by the Engineer. The signs shall typically be placed in advance of the first Road Construction Ahead signs at either end of the project. The actual location and quantity of the signs will be determined by the Engineer in coordination with the Worksite Traffic Control Supervisor.

The XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in., shall be installed on all projects in all cases not otherwise described below.

The XW2-6 Worksite Added Penalty sign, 60 in. by 36 in., shall only be installed on projects in urban areas that have a posted speed limit of 35 MPH or less and also meet one of the following conditions:

1. The existing surfaces outside the edge of pavement make installation of driven posts impractical, or
2. The width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A, Worksite Added Penalty sign, 78 in. by 42 in.

The XW2-6a-B Speeding and XW2-6b-B Reckless Driving signs, 48 in. by 48 in., shall be used in series with each other and shall only be used on projects that meet one of the following conditions:

1. Rural projects where the width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in., or
2. Contracts using only moving operations where construction signs are set and removed each day to accommodate the changing location of the work.

The XW2-6a-A Speeding and XW2-6b-A Reckless Driving signs, 36 in. by 36 in., shall be used in series with each other and shall only be used on projects in urban area where the width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in.

Worksite Added Penalty, Speeding, Reckless Driving signs will be measured and paid for as Construction Sign, Type **CA** in accordance with 801.17 and 801.18.

COMMENTS AND ACTION

801-R-542 WORKSITE ADDED PENALTY SIGNS

DISCUSSION:

Mr. Orton introduced and presented this item proposing to revise the pay item referenced in 801-R-542 from type C to type A¹.

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

Motion: Mr. Orton Second: Mr. Boruff Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: ☒ Passed as Submitted ☐ Passed as Revised ☐ Withdrawn
Standard Specifications Sections referenced and/or affected: 801 pg 745.	☐ 2018 Standard Specifications ☐ Revise Pay Items List
Recurring Special Provision affected: 801-R-542 WORKSITE ADDED PENALTY SIGNS	☐ Create RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date:
Standard Drawing affected: NONE	☒ Revise RSP (No.801-R-542) Effective <u>Sept. 01, 2017</u> Letting RSP Sunset Date:
Design Manual Sections affected:	☐ Standard Drawing Effective
GIFE Sections cross-references:	☐ Create RPD (No. <u> </u>) Effective <u> </u> Letting ☐ GIFE Update ☐ SiteManager Update

¹ Corrected on March 24, 2017.

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

There is confusion in the standard specifications regarding calibration tolerances for scales and meters at concrete plants. The current wording does not clearly differentiate between scales and meters. It also does not state an accuracy for meter calibration. Instead it references "other measuring devices" which leads to the assumption that meters and scales should both be accurate to 0.5%. This is incorrect and meters should be accurate to 1.0%

There is also confusion differentiating between the tolerances for calibrating scales and meters and the proportioning tolerances that are allowed when batching a load of concrete into a truck. As currently written, the specification is often interpreted that admixture meters can be calibrated to a tolerance of 3% instead of the intended 1.0%.

PROPOSED SOLUTION:

Removing the words "and other measuring devices" will eliminate the assumption that meters and scales should have the same accuracy. A statement will be added to indicate that water and admixture meters should be calibrated to 1.0%. The sentence preceding the list of proportioning tolerances is being changed to better clarify that it references batching and not calibration.

APPLICABLE STANDARD SPECIFICATIONS: 508.02(b)

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: N/A

IMPACT ANALYSIS (attach report):

Submitted By: Matt Beeson

Title: State Materials Engineer

Organization: INDOT Office of Materials Management

Phone Number: 317-610-7251 x 204

Date: 2/22/17

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

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

Does this item appear in any other specification sections? No

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

Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? No

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

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

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

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

REVISION TO STANDARD SPECIFICATIONS

SECTION 508 - EQUIPMENT

508.02(b) PROPORTIONING SYSTEM

The Standard Specifications are revised as follows:

SECTION 508, BEGIN LINE 14, DELETE AND INSERT AS FOLLOWS:

(b) Proportioning System

Batching plants shall be equipped to proportion aggregates and bulk cement by weight by means of automatic and interlocked proportioning devices. PCCP produced in accordance with 501 and 502 shall document each ingredient in each batch.

All scales and other measuring devices shall be accurate to within $\pm 0.5\%$ throughout their range unless otherwise approved. For applied loads less than 1,000 lb on the cement scale and 4,000 lb on the aggregate scale, the scales shall be accurate to 2.0% or 1 gradation.

Meters for both admixtures and water shall be accurate to within 1.0%.

Means of control shall be provided so that as the quantity desired in the weighing hopper is approached, the materials may be added at a slower rate and shut off with precision. ~~The accuracy of the proportioning system shall be as follows:~~ *The following proportioning tolerances shall be used for batching:*

1. admixtures..... $\pm 3\%$
2. aggregates..... $\pm 2\%$
3. cementitious materials..... $\pm 1\%$
4. water, volume or weight..... $\pm 1\%$.

COMMENTS AND ACTION

508.02(b) PROPORTIONING SYSTEM

DISCUSSION:

This item was introduced and presented by Mr. Beeson who stated that removing the words "and other measuring devices", shown in 508.02(b), will eliminate the assumption that meters and scales should have the same accuracy. Language has been added to indicate that water and admixture meters shall be calibrated to 1.0%. The sentence preceding the list of proportioning tolerances is also being changed to better clarify that it references batching and not calibration.

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

Motion: Mr. Beeson Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: <u>YES</u>	Action: <u>X</u> Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections referenced and/or affected: 508.02 pg 387. Recurring Special Provision affected: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	<u>X</u> 2018 Standard Specifications ____ Revise Pay Items List ____ Create RSP (No. ____) Effective ____ Letting RSP Sunset Date: ____ Revise RSP (No. ____) Effective ____ Letting RSP Sunset Date: ____ Standard Drawing Effective ____ Create RPD (No. ____) Effective ____ Letting ____ GIFE Update ____ SiteManager Update