INDIANA DEPARTMENT OF TRANSPORTATION

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Eric Holcomb, Governor
Joe McGuinness, Commissioner

FINAL DRAFT MINUTES

May 20, 2021 Standards Committee Meeting

(Changes to the Agenda by the Action of the Committee shown as highlighted yellow and to the First Draft Minutes based on comments received shown as highlighted teal and are on pg. 26, 36, and 53.)

June 9, 2021

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the May 20, 2021 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow, Chairman, at 09:03 a.m. on May 20, 2021, which was held virtually via *Teams* (Microsoft application). The meeting was adjourned at 11:22 a.m.

The following committee members were present:

Gregory Pankow, Chairman, Director, Construction Management
John Wooden, Contract Administration Division
Dave Boruff, Traffic Engineering
Mark Orton, Bridge Design Division
Joe Novak, Construction Management
Kumar Dave, Pavement Engineering, Highway Design
Jim Reilman, Materials and Tests Division
Michael Koch, District Construction, Fort Wayne District
Alisa Bowen*Elena Veksler, Highway Design and Technical Support
Kurt Pelz, Construction Technical Support
**Proxy for Elena Veksler*

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

Bidlack, Angie, INDOT
Bates, Nickolas, INDOT
Leffel, Victoria, INDOT
Matumueni, Justin, FHWA
Mouser, Elizabeth, INDOT
Nelson, Mike, INDOT
Osborn, Dan, ICI
Patterson, Patrick, INDOT

Barich, Dave, INDOT
Beeson, Matthew, INDOT
Blanchard, Jacob, INDOT
Corrice, Zachariah, INDOT
Duncan, Thomas, FHWA
Fisher, Steve, INDOT
Hauser, Derrick, INDOT
Harris, Tom, INDOT
Leckie, John, guest
McNutt, Donald, guest
Rizzo, Calvin, INDOT
Pfeiffer, Nate, INDOT
Podorvanova, Lana, INDOT
Smart, Steve, guest
Smutzer, Katherine, INDOT
Siddiki, Nayyar, INDOT
Stickney, Daniel, INDOT
Susong, John, guest
Wortkoetter, Andrew, INDOT
White, Peter, INDOT
Trammell, Scott, INDOT
Nantung, Tommy, INDOT

The following items were discussed:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS *(No items were listed)*

NEW BUSINESS

1. *Approval of the Minutes from the April 15, 2021 meeting*

DISCUSSION: Mr. Pankow requested a motion to approve the Minutes from the April 15, 2021 meeting.

Motion: Mr. Novak
Second: Mr. Reilman
Ayes: 9
Nays: 0
Absent:…1

ACTION: PASSED AS SUBMITTED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS *(No items were listed)*

NEW BUSINESS *(No items were listed)*

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

OLD BUSINESS *(No items were listed)*

NEW BUSINESS

Item No. 1 (2022 SS) Mr. Reilman pg 5
Standard Specifications:
203.18 Embankment Construction

ACTION: PASSED AS REVISED

Item No. 2 (2020 SS) Mr. Reilman pg 11
Standard Specifications:
909.02(d) Waterborne Finish Paint

ACTION: PASSED AS SUBMITTED

Item No. 3 (2022 SS) Mr. Reilman pg 15
Standard Specifications:
(proposed new)
SECTION 510 *SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS*

ACTION: WITHDRAWN

Item No. 4 (2022 SS) Mr. Reilman pg 22
Standard Specifications:
SECTION 204 GEOTECHNICAL INSTRUMENTATION

ACTION: PASSED AS REVISED

Item No. 5 (2022 SS) Mr. Reilman pg 34
Standard Specifications:
SECTION 202- REMOVAL OF STRUCTURES AND OBSTRUCTIONS
202.08 Removal of Underground Storage Tanks Containing Petroleum Products or Other Hazardous Chemicals

SECTION 203 - EXCAVATION AND EMBANKMENT
203.09 General Requirements
203.16(b) Treatment by Removal
203.18 Embankment Construction

SECTION 204 - GEOTECHNICAL INSTRUMENTATION
204.02 Materials

SECTION 206 - STRUCTURE EXCAVATION
206.07 Disposal of Excavated Material

SECTION 211 - B BORROW AND STRUCTURE BACKFILL
211.02 Materials

SECTION 701 - STRUCTURES
701.02 Materials

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
715.02 Materials

SECTION 904 - AGGREGATES
904.03(f) Sampling and Testing
904.06 *B Borrow*
904.0~~6~~*7* Exceptions to AASHTO Standard Methods

ACTION: PASSED AS REVISED

Item No. 6 (2022 SS) Mr. Reilman pg 43
Standard Specifications:
SECTION 214 GEOSYNTHETICS

SECTION 610 - APPROACHES AND CROSSOVERS
610.02 Materials
610.05 Method of Measurement
610.06 Basis of Payment

SECTION 918 - GEOSYNTHETIC MATERIALS
918.02 Geotextile
918.03 Geomembrane
918.05 Geogrid

ACTION: PASSED AS REVISED

cc: Committee Members
FHWA
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STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Specification 203.18 did not include guidance for RAP embankment construction.

PROPOSED SOLUTION: Revise language in Specification 203.18 to include RAP embankment construction guidance plus add language to clarify recycled concrete pavement embankment construction requirements.

APPLICABLE STANDARD SPECIFICATIONS: 203.18

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: No

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT: NA

IMPACT ANALYSIS (attach report): NA

Submitted By: Jim Reilman for Nayyar Siddiki

Title: State Materials Engineer

Organization: Office of Materials & Tests

Phone Number: 317-522 9692

Date: 04/23/2021

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? NA

Ride quality? NA

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? NA

For construction workers? NA

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? NA

Design process? NA

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?

Is this proposal needed for compliance with:

Federal or State regulations? NA

AASHTO or other design code? NA

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 203 - EXCAVATION AND EMBANKMENT
203.18 Embankment Construction

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 767, DELETE AND INSERT AS FOLLOWS:

203.18 Embankment Construction

Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the construction of dikes within or outside the right-of-way; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area. Only approved materials shall be used in the construction of embankment backfill. *Recycled concrete pavement shall be from past documented ~~INDOT~~ Department projects. RAP shall be the product resulting from the cold milling or crushing of an existing HMA pavement.* Rocks, broken concrete, *RAP*, or other solid materials shall not be placed in embankment areas where piling is to be placed or driven.

Recycled concrete pavement ~~may be used in embankment construction. The recycled material~~ shall meet the *gradation* requirements of B borrow in accordance with 211.02 ~~or rock embankment in accordance with 203.20~~*904.06. Construction requirements shall be in accordance with 203.20(a), or 211.03.*

Only RAP particles measuring ~~greater than~~ 2 in. or less in all directions shall ~~not~~ be incorporated into the top 5 ft of the embankment. RAP particles incorporated anywhere in the embankment shall be ~~greater than~~ 5 in. ~~shall not be incorporated~~ or less ~~into the embankment. Construction requirements shall be in accordance 203.20(b).~~

When two sizes are used for one embankment, materials shall be separated with a layer of geotextile in accordance with 918.02(c), Type 2A. Geotextile used between recycled material lifts shall be included in the cost of the embankment pay item.

Recycled concrete pavement and RAP shall not be mixed together or ~~mixed~~ with other materials. When two or more approved materials are allowed for one embankment, materials shall be separated with a layer of geotextile in accordance with 918.02(c), Type 2A. Geotextile used between recycled material lifts shall be included in the cost of the embankment pay item.

~~The~~ *R*ecycled concrete pavement *or RAP* ~~may~~*shall* only be ~~placed~~*used* below the *elevation of the* pavement underdrains ~~and shall be constructed in accordance with 203.23 or 203.24~~. *Compacted lift thickness for RAP shall not be greater than 6 in. within the top 5 ft of the embankment. Where the depth of the embankment exceeds 5 ft, ~~and~~ the compacted lift thickness for RAP shall not be greater than 12 in. ~~below the top 5 ft of the embankment~~.* ~~The~~ *R*ecycled concrete pavement and *RAP* shall not be used within 2 ft of the water table.

REVISION TO STANDARD SPECIFICATIONS

SECTION 203 - EXCAVATION AND EMBANKMENT
203.18 Embankment Construction

~~*The embankment stiffness testing shall be performed in accordance with 203.24(b).* Proofrolling in accordance with 203.26 shall be performed to cover the whole*entire* grade for every 5 ft of fill. Any rut greater than 1/2 in. shall be corrected as directed.~~

Recycled concrete pavement shall be constructed in accordance with 203.20. RAP shall be constructed in accordance with 203.23 or 203.24. Proofrolling in accordance with 203.26 shall be performed to cover the entire grade for every 5 ft of fill.

A geotextile in accordance with 918.02*(c), Type 1B* shall be placed *in accordance with 214* prior to the placement of ~~other material when the material is finer than recycled material~~*subgrade treatment Type IC, Type II, or Type IV in accordance with 207 when recycled concrete pavement or RAP is used for embankment construction. Recycled concrete pavement or RAP shall not be used for embankment construction when subgrade Type I, Type IBC, or Type IBL is specified. Geotextile shall be placed completely covering the top of the embankment. A minimum 24 in. soil encasement shall be constructed concurrently with the recycled concrete pavement or RAP lifts.* ~~A minimum 18 in. encasement suitable for vegetation growth shall be constructed in accordance with 203.09~~*The soil encasement shall be suitable for vegetation growth and shall be constructed in accordance with 203.09.*

COMMENTS AND ACTION

203.18 Embankment Construction

DISCUSSION:

This item was introduced and presented by Mr. Reilman who stated that Standard Specification Section 203.18 did not include guidance for RAP embankment construction.

Mr. Reilman proposed to revise the language in 203.18 to include RAP embankment construction guidance plus add language to clarify recycled concrete pavement embankment construction requirements.

In addition to originally proposed changes and following much discussion prior to the meeting, between Mr. Siddiki, Mr. Koch, Ms. Leffel, and Mr. Reilman, Mr. Reilman proposed the above shown revisions.

Mr. Koch asked if the 6 in. lift language should only apply to RAP, and if the recycled concrete pavement should be constructed in accordance with 203.20(a). After discussion and collaboration between various committee members, further editorial revisions were made as shown.

Mr. Koch asked if the impermeable geotextiles could create a slip plane which would allow the encasement to slide. Mr. Siddiki said that using these materials is a safe way to go.

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

COMMENTS AND ACTION

203.18 Embankment Construction

[CONTINUED]

Motion: Mr. Reilman Second: Mr. Dave Ayes: 9 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 203.18 pg 167 (2020 SS) Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	___ 2024 Standard Specifications ___ Revise Pay Items List _X_ Create RSP (No. 203-R-xxx) Effective: December 1, 2021 RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: _X_ GIFE Update __ Frequency Manual Update ___ SiteManager Update

Mr. Reilman
Date: 5/20/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Vehicle solids no longer needs to be tested for waterborne finish paints.

PROPOSED SOLUTION: Delete vehicle solids as a required property

APPLICABLE STANDARD SPECIFICATIONS: 909.02(d)

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: Ad hoc: Kelly Cummins, Seth Estep, Jim Reilman

IMPACT ANALYSIS (attach report): yes

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: 317-522-9692

Date: 4/23/21

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? N/A

Construction time? N/A

Customer satisfaction? Yes

Congestion/travel time? N/A

Ride quality? N/A

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

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? Yes

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

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

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

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

REVISION TO 2020 STANDARD SPECIFICATIONS

SECTION 909 - PAINT AND LIQUID EPOXY
909.02(d) Waterborne Finish Paint

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 909, BEGIN LINE 161, DELETE AS FOLLOWS:

3. Mixed Paint Properties

The mixed paint shall be in accordance with the following requirements.

Viscosity, ASTM D 562, Krebs Units .....80 – 110
Weight/volume, ASTM D 1475, variation from
the initially approved formulation, 25°C, max. .....0.024 kg/L
Pigment grind, ASTM D 1210, Hegman, min. 5
Total solids, % by weight, ASTM D 2369, min. 48
~~Vehicle solids, % by weight of vehicle, min. .....37.5~~
Dry time, ASTM D 1640, 3 mils wet film thickness
on a tin coated steel panel, max.:
Set-to-touch .....1 h
Dry hard .....24 h
Contrast ratio, ASTM D 2805, 5 ±0.5 mils wet film thickness
dried 24 h on Leneta Form 2A or 2C, min. 0.97
Specular gloss, 60°, 10 mils ±0.5 mils wet film thickness
on a tin coated steel panel, dried 48 h, ASTM D 523, max. 30
pH, ASTM E 70 .....7.0 – 9.5
Volatile organic compounds, ASTM D 3960, max. .....180 g/L

COMMENTS AND ACTION

909.02(d) Waterborne Finish Paint

DISCUSSION:

Mr. Reilman introduced and presented this item explaining that vehicle solids no longer need to be tested for waterborne finish paints.

Mr. Reilman therefore proposed to delete vehicle solids as a required property from 909.02.

Mr. Boruff asked if this change will provide more flexibility. Mr. Reilman responded that as long as total solids meets the spec requirements, this will not be necessary.

There was no further discussion and this item passed as submitted.
Post-meeting note: Proposed revision was reflected in 2022 Standard Specifications and therefore creating RSP 909-M-xxx is not necessary.

Motion: Mr. Reilman Second: Mr. Novak Ayes: 9 Nays: 0 FHWA Approval: YES	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 909.02 pg 983 (2020 SS)	X ~~2024~~*2022*-Standard Specifications ___ Revise Pay Items List
Recurring Special Provision references in: NONE	~~X~~ Create RSP ~~(No. 909-M-xxx)~~ Effective: ~~December 1, 2021~~ RSP Sunset Date:
Standard Drawing affected: NONE	___ Revise RSP (No.___) Effective: RSP Sunset Date:
Design Manual Sections affected: NONE	___ Standard Drawing Effective:
GIFE Sections cross-references: NONE	___ Create RPD (No. ___) Effective:
	___ GIFE Update ___ Frequency Manual Update X SiteManager Update

Mr. Reilman
Date: 5/20/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: A new type of portland cement concrete pavement joint sealer, soy methyl ester, is available for use. INDOT does not currently have a specification for this material.

PROPOSED SOLUTION: Create an RSP for soy methyl ester sealer

APPLICABLE STANDARD SPECIFICATIONS: none

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 510 RSP

PAY ITEMS AFFECTED:

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Gary Fox, Tommy Nantung, Mike Nelson, Jim Reilman

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: 317-522-9692

Date: 4/26/2021

Mr. Reilman
Date: 5/20/21

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? N/A

Construction time? N/A

Customer satisfaction? Yes

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? Yes

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? Yes

Design process? N/A

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

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

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

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

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

REVISION TO STANDARD SPECIFICATIONS

SECTION 510 - SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS (proposed new)

510-R-XXX SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS

(Adopted xx-xx-xx)

The Standard Specifications are revised as follows:

SECTION 510, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 510 - SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS

510.01 Description

This work shall consist of furnishing and installing a soy methyl ester, SME, PCC sealer and hot poured joint sealant at joints in PCC pavement in accordance with 105.03.

MATERIALS

510.02 Materials

SME penetrating sealer shall be in accordance with the following:

Active Ingredients	*Requirement*
Soy-Based	*90% minimum*
SME, by mass	*95% - 98%*
Polystyrene, by mass	*2% - 5%*

The SME PCC sealer shall be delivered to the jobsite in unopened containers with the manufacturer's numbered seal intact.

A Type B certification in accordance with 916 shall be provided for the SME penetrating sealer. The limits of the active ingredients test values listed above shall be provided on the certification.

Hot poured joint sealant shall be in accordance with 906.02.

CONSTRUCTION REQUIREMENTS

510.03 Surface Preparation

The concrete surrounding the joint shall be a minimum of 14 days old prior to surface preparation. Existing joint sealant or other debris remaining in the joint shall be flushed with water. No sawing or routing shall be performed. Water may be applied under pressure in a manner to which no damage to the concrete occurs. Joints shall be cleaned and dried with compressed air. Air compressors shall be capable of producing a minimum air pressure of 100 psi. Joints shall be cleaned with compressed air as frequently as necessary for final cleaning and to facilitate drying. A heat lance may be used to accelerate

drying, as approved by the Engineer. The joint shall be completely clean and dry prior to the application of the SME penetrating sealant.

510.04 Penetrating Sealer Application

(a) Weather Limitations

Sealing operations shall not be conducted on a visibly wet surface, when the ambient temperature is below 40°F, or when other unsuitable conditions exist, unless approved by the Engineer.

If rainfall occurs within 6 h of application, the application shall be repeated in affected areas after the rainfall has ended. Joints shall be dried with compressed air prior to the re-application of the final coat.

(b) Sealing

Transverse and longitudinal joints constructed in accordance with 503.03(a), 503.03(b), or 503.03(d) shall be sealed with the SME penetrating sealer in accordance with the sealant manufacturer's recommendations. ~~Construction~~ Transverse construction joints, in accordance with 503.03(c), shall not be sealed. Sealant shall not be applied if the air or concrete temperature is below the dew point or freezing point. When applying the sealant adjacent to asphalt, care shall be taken to avoid contact with the asphalt.

The material shall be applied using a low pressure sprayer. The sealer shall be applied at the manufacturer's specified application rate. The Contractor shall create a small reservoir of sealant at the base of the joint that can be absorbed into that critical area over the following hours. An additional pass shall be applied to the surface extending a minimum of 3 in. on either side of the joint.

(c) Opening to Traffic

The sealant shall be allowed to dry in accordance with the manufacturer's recommendations, except the dry time shall be no less than 6 h. Crossing county roads and public and private drives may be used after 2 h of drying time. This shall include slow moving safety vehicles and support vehicles in treated areas.

510.05 Hot Pour Joint Sealant

(a) Application

Hot poured joint sealant shall be applied to the joints after a minimum of seven days have passed since the application of the SME penetrating sealer. The joints shall be cleaned with air compressors capable of producing a minimum air pressure of 100 psi. Water blasting shall not be utilized. Backer rods shall not be used. Joints shall be filled with hot poured joint sealant in accordance with the manufacturer's recommendations within 1/4 in. below the surface. A distributor in accordance with 409.03 shall be used with an indirect-heat double boiler kettle and mechanical agitator. The hot poured joint sealant

shall be placed utilizing a V-shaped wand tip, to allow the penetration of the materials into the joints.

(b) Opening to Traffic

Treated areas shall not be opened to traffic until the hot pour joint sealant has set and does not track or otherwise pull out of the joint.

When traffic is to be maintained within the limits of the section, temporary traffic control measures in accordance with 801 shall be used.

510.06 Method of Measurement

SME penetrating sealer for PCC joints will be measured by the linear foot, complete in place.

510.07 Basis of Payment

SME penetrating sealer for PCC joints will be paid for at the contract unit price ~~by the~~ per linear foot, complete in place.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
SME Penetrating Sealer for PCC Joints	*LFT*

The cost of the SME penetrating sealer material, hot poured joint sealant, transportation, equipment, joint cleaning and preparation, placement, and all incidentals shall be included in the cost of the pay item.

COMMENTS AND ACTION

SECTION 510 - SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS

DISCUSSION:

This item was introduced and presented by Mr. Reilman, who explained that a new type of portland cement concrete pavement joint sealer, soy methyl ester, is available for use. The Department does not currently have a specification for this material.

Mr. Reilman proposed to create an RSP for soy methyl ester sealer, as shown above. Minor editorial revisions are as shown.

Mr. Koch asked, regarding the language in 510.04(b), if the joint should be sealed if it is saw cut. Mr. Koch stated that nearly every joint that is part of the construction work has been, or will be, sawed.
Mr. Nantung replied that for a construction joint that is only 1 in. deep, the sealant is not needed.

Mr. Koch responded that the Department uses salt/brine a lot and that we currently seal all joints (see RSP 503-R-692) with the proposal eliminating the sealing of construction joints. All joints do not receive the same tire contact which can flush joints during rain events; longitudinal joints are seldom crossed. In general, the number of transverse construction joints are limited. Sawing opens the pours of the stone/concrete, as such I favor sealing (soy methyl ester) at a minimum. Although out of the scope of this specification proposal, if we as an organization believe hot poured joint sealant is not necessary for high speed transverse joints, applying soy methyl ester would still be beneficial.

Mr. Nantung explained some of the various research experiments and their results which necessitates the need for better drainage layers, and agreed with Mr. Koch to not seal the joints, but added that we need to figure out how to make our drainage correct first.

Mr. Reilman decided to withdraw this item in order to allow time to address all concerns associated with this item.

COMMENTS AND ACTION

SECTION 510 - SOY METHYL ESTER PENETRATING SEALER FOR PCC JOINTS

[continued]

Motion: Mr. Reilman Second: Mr. Ayes: Nays: FHWA Approval:	Action: ___ Passed as Submitted ___ Passed as Revised _X_ Withdrawn
Standard Specifications Sections referenced and/or affected: 510 (proposed new) Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	___ 2024 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No._____) Effective: _____ RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update __ Frequency Manual Update ___ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Many settlement plates often become damaged during construction of embankments. Once damaged, the settlement plate may not be able to be repaired.

PROPOSED SOLUTION: Adding Vibrating Wire Settlement Systems as a geotechnical instrument in the 204 section offers an alternative to settlement plates.

APPLICABLE STANDARD SPECIFICATIONS: 204

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: yes

APPLICABLE RECURRING SPECIAL PROVISIONS: yes, create new RSP

PAY ITEMS AFFECTED: Yes

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Geotechnical Engineering Division, Division of Material and Test, Geotechnical Consultants, and manufacturers developed these specifications.

IMPACT ANALYSIS (attach report): NA

Submitted By: Jim Reilman for Nayyar Siddiki

Title: State Materials Engineer

Organization: Division of Materials and Tests

Phone Number: 317-522 9692

Date: 04/21/2021

Mr. Reilman
Date: 5/20/21

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? NA

Congestion/travel time? NA

Ride quality? NA

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? NA

For construction workers? NA

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? NA

Design process? Yes

Will this change provide the contractor more flexibility? Yes

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

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

Is this proposal needed for compliance with:

Federal or State regulations? NA

AASHTO or other design code? NA

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 204 – GEOTECHNICAL INSTRUMENTATION

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 204, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 204 – GEOTECHNICAL INSTRUMENTATION

204.01 Description

This work shall consist of providing, installing and maintaining ~~of~~ geotechnical instrumentation including settlement plates, settlement stakes, lateral stakes, *vibrating wire settlement systems,* and standpipe piezometers as directed and in accordance with 105.03.

MATERIALS

204.02 Materials

Materials shall be in accordance with the following:

B Borrow	~~211.02~~*904*
Coarse Aggregate, Class D or Higher, Size No. 53.	904.03
Ottawa Sand*	AASHTO T 252
Portland Cement, type I	*901.01(b)*
Structure Backfill, Size No. 30	904.05
Water	*913.01*

* Ottawa Sand shall have a minimum permeability of 25 ft/day.

Bentonite chips shall consist of commercially processed angular fragments of pure bentonite, without additives.

Bentonite-cement grout shall consist of a mixture with the ratio of 25 lb of bentonite with 94 lb of portland cement, Type I ~~in accordance with 901.01(b)~~ and a 30 gal. of water.

CONSTRUCTION REQUIREMENTS

204.03 Settlement Plates

Settlement plates consist of 1/2 in. by 3 ft by 3 ft steel plate equipped with sections of 3/4 in. pipe and 2 in. galvanized threaded pipe and couplings to act as a cover or guard.

(a) Installation Requirements

Each settlement plate shall be placed on a horizontal plane consisting of a compacted leveling layer of B borrow, whose surface is not less than 1 ft below the elevation of the adjacent area. The first section of pipe shall then be installed by welding to the settlement plate. The bottom elevation of the settlement plate will be recorded. The area is backfilled with B borrow and thoroughly compacted. The couplings shall be tack

welded and the top elevation of the first pipe section will be recorded before starting the first lift of grading operations.

The pipe sections for the settlement plates shall be 3/4 in. steel pipe, 4 ft long and threaded on both ends with proper fittings so that such pipe sections can be extended vertically from the center of the plates up through the new embankment as it increases in height during grading operations. A cover pipe 2 in. shall be slipped over and centered on the standpipe, and not welded to plates. The 3/4 in. steel and cover pipes shall extend a minimum of 2 ft or more above the grade of the new embankments at all times during grading operations and monitoring period.

Settlement stakes and lateral stakes, if required, shall be installed as shown on the plans or as directed by the Engineer. The stakes shall be 3/4 in. by 4 ft steel rods and shall be driven at least 12 in. into the ground. These stakes shall be set firmly in a vertical position and initial readings will be taken.

B borrow shall be used as compaction material around the settlement plates and pipes and shall be placed in accordance with the applicable requirements of 211.

(b) Instrument Readings and Settlement Period

During the construction of the embankment, elevation readings will be taken on all settlement plate extension pipes and settlement stakes at the end of each seven-day period, or more frequently if required. After the embankment is constructed to the bottom of the subgrade, additional readings will be taken every seven days until the settlement rate per week is 1/4 in. or less for four consecutive weeks. The monitoring period may be reduced as directed by the Department's Geotechnical Engineering Division.

If the results of any readings indicate that the new embankment has settlement greater than 1/4 in., the monitoring period will be extended until the settlement requirements are met.

Settlement stakes will be used to measure the vertical movement, in conjunction with settlement plates if specified. Settlement stakes and settlement plates will be monitored at the same time and interval. Measurements will be made to the nearest 1/4 in. Within one day of the readings, settlement data will be sent electronically to the Department's Geotechnical Engineering Division and will be subject to approval.

Lateral stakes will be used to monitor horizontal movement of the ground or new fill. If lateral movement is noticed during the construction of the fill, the work will be suspended and the Department's Geotechnical Engineering Division will be contacted. Measurements will be made to the nearest 1/4 in.

Settlement plates, extension pipes, cover pipes, and stakes shall be protected during construction operations and during the monitoring period.

(c) Protection and Maintenance

The settlement stake and settlement plate shall remain in a vertical position. The Contractor shall ensure that settlement plates and settlement stakes are not damaged or displaced. Settlement stakes and settlement plates deviating from a vertical position, becoming uncoupled, or broken shall be repaired or replaced by the Contractor, as directed by the Engineer.

The Contractor will not be held responsible for repair or replacement of any settlement plate assembly which is damaged as a result of instability of the embankment caused by factors beyond the control of the Contractor, as determined by the Engineer.

204.04 Vibrating Wire Settlement Systems

A ~~Geokon Model 4660 or other compatible~~vibrating wire settlement system from the Department's QPL for Vibrating Wire Settlement ~~s~~Systems shall be provided. A vibrating wire settlement system will be considered for inclusion on the QPL by following ITM 806, Procedure U. The settlement system shall consist of sensor, tubing, and reservoir system. ~~The vibrating wire settlement system shall have a resolution of 0.025% of the full-scale range with an accuracy of ±0.1% of the full-scale range.~~ The system shall also have the capability of being attached to a datalogger and be remotely monitored via a cell phone modem.

Structure backfill shall be No. 30 sand in accordance with 904.05.

The Contractor shall submit a type D certification in accordance with 916 and the manufacturer's calibration report for the settlement system to the Engineer and to the Department's Geotechnical Engineering Division two weeks prior to beginning construction. The Contractor shall supply the hardware, software, power supply, and monitoring system.

A qualified geotechnical consultant, from the Department's list of Qualified Geotechnical Consultants, shall install these devices as specified by the manufacturer.

(a) Installation Requirements

Prior to installation, the settlement system materials shall be assembled and inspected for defects in accordance with manufacturer's instructions and recommendations. The Contractor shall verify that all cable and tube lengths are of sufficient length to facilitate proper installation and layout. Cables and tubes shall be labeled with a unique instrument number using a permanent marking system at the terminal end, at the sensor end, and at 50 ft intervals in between.

The settlement cells shall be mounted onto rigid plates. The Contractor shall also install at least two survey pins on the plates and provide easy access to the markers for a survey crew to measure elevations using standard tools.

The Contractor shall provide details for protecting the signal cables and tubing at the connection from the reservoir to the settlement plate.

~~The Contractor shall avoid s~~Sharp bends where the signal cable and tubing exit the embankment shall be avoided. All signal cable and tubing shall be run in a 1 ft deep ~~and~~ by 1 ft, minimum, wide trench using structure backfill for 3 in. under the cable and 3 in. over the cable, or other approved method, to protect the signal cable and tubing from damage. The Contractor shall run cabling and tubing leaving enough slack to provide necessary strain relief for the anticipated movements in accordance with the manufacturer's recommendations.

Only hand tools shall be used to place and compact fill material for a height of 1 1/2 ft above signal cable, tubing, and the settlement plate. The Contractor shall avoid driving heavy equipment that causes rutting deeper than 2 in. over or near the signal cable, tubing, and settlement plate until the height of the fill over the signal cable, tubing, and settlement plate reaches at least 5 ft.

The signal cable and tubing shall terminate at a datalogger inside a lockable readout enclosure. The enclosure shall be mounted on a post driven into stable ground as close as possible to the right of way line. The Contractor shall keep the fluid reservoir vertical at all times. The sensor and tubing shall be at a lower elevation than the instrument reservoir at all times. The enclosure and instrument tubing from the ground into the reservoir enclosure shall be protected from thermal influence.

After the completion of the installation, a detailed installation log shall be completed. The as built location in a horizontal position shall be determined for both the sensor and the reservoir to an accuracy of ±1 ft and the elevation for both the sensor and the reservoir determined to an accuracy of ±0.01 ft.

After the completion of the installation, a post-installation acceptance test shall be performed by obtaining three independent readings from the sensor in accordance with the manufacturer's recommendations. The acceptance test shall be performed prior to backfilling of the trench. This shall be accomplished using a vibrating wire readout compatible with the installed settlement system. Elevations obtained from all three readings shall be within a range of 0.02 ft from each other. The Engineer ~~shall~~ will review the data from these readings to determine whether the instrument is acceptable.

The Contractor shall be responsible for any damage to the vibratory wire settlement systems.

(b) Instrument Reading and Documentation

Monitoring will be performed by the Department's Geotechnical Engineering Division. Measurements at each instrument will include the raw readings from the

settlement cell, the temperature at the settlement cell, and the temperature at the reservoir. Instruments will be read in accordance with 101.36~~.~~, or as recommended by the Engineer.

The Geotechnical Engineering Division will keep a weekly record which lists for each settlement system~~:~~, sensor elevation, reservoir elevation, and list of pay items. A copy of each weekly report shall be provided to the Engineer.

204.045 Standpipe Piezometers

The standpipe piezometers shall be installed by a geotechnical consultant on the Department's Qualified Geotechnical Consultant's List prior to placing the first lift of embankment. Piezometer consists of a 1/2 in. leak proof, flush-coupled Schedule 80 PVC pipe or ABS standpipe extending to the surface of the embankment with an attached polyethylene tip in accordance with AASHTO T 252.

(a) Installation Requirements

A separate water-monitoring borehole shall be installed outside the influence of the fill as shown on the plans. This shall be a minimum 2 in. diameter borehole, cased with slotted pipes, drilled to a recommended depth and location or as directed by the Engineer, to establish groundwater elevation prior to piezometer installation.

The installation of the standpipe piezometer shall precede placement of any embankment by at least two weeks to allow time for testing of the installation. The piezometer shall be maintained and protected during the embankment construction. The hollow stem auger shall be advanced to an approximate depth of 6 in. below the recommended piezometer tip elevation. Augers shall be cleaned and washed inside for their full length, until the wash water runs clear.

The auger shall be withdrawn 6 in. by means of jacking or other steady pull operations. The hole shall be filled to the bottom with saturated Ottawa sand and tamped with an annular tamping hammer. The elevation shall be measured and provided to the Engineer.

The tip shall be attached to the standpipe and tested for free flow of water. The bottom end of the tip shall be plugged and soaked in water if a porous stone tip is used. The tip and standpipe shall be filled with clean water. The tip shall be lowered into the auger until it rests on the top of the sand placed and the elevation of the tip should be documented. Excess head shall be maintained in the standpipe during lowering to ensure that a small amount of water flows out of the tip.

The auger shall then be pulled or jacked a distance equal to the length of the tip in increments of 6 in. The hole shall be filled with water saturated Ottawa sand at each increment. This layer of sand shall not be tamped in order to avoid damage to the tip.

The auger shall be raised 12 in. and the hole filled with saturated Ottawa sand in 6 in. increments until the backfilling reaches a minimum of 6 in. below the elevation of the strata change or as directed by the Engineer. In locations where there is no strata change, the Ottawa sand shall be placed a minimum of 12 in. above the top of the tip.

The augers shall then be raised and the hole sealed with bentonite chips in accordance with AASHTO T 252 which shall be placed in 6 in. lifts. The top of the seal shall be a minimum of 6 in. above the strata break. A weighted line shall be used to ensure the bentonite seal is in place. The remainder of the hole shall then be backfilled with bentonite-cement grout as the augers are withdrawn. The riser pipe shall be kept in tension and shall be centered in the auger while backfilling. Depths for various stages shall be recorded on the Engineer's logs.

If the piezometer location is not in an area of proposed fill, an approximately 3 ft long protective metal cover shall be installed at the top with approximately 2 ft below the surface and 12 in. above the surface. A 12 in. diameter by 6 in. thick circular pad of coarse aggregate shall be filled around the cover. A lockable cap shall be securely attached onto the protective metal cover.

If the piezometer location is in an area of proposed fill, a PVC casing shall be used around the piezometer standpipe in order to protect the pipes during embankment construction. B borrow shall be placed and compacted around the casing without disturbing the casing.

The casing and standpipe shall be extended as the fill is placed, by adding extra lengths not to exceed 5 ft. The top of the standpipe shall be at least 12 in. above the grade of the new fill. Each time the casing and standpipe are extended, the casing shall be filled with structure backfill. The last extension of pipe shall be of such length that it extends 12 in. above grade. It shall be filled with structure backfill to within 9 in. of the top of the casing. A 12 in. diameter by 6 in. thick circular pad of coarse aggregate shall be filled around the pipes. A lockable cap shall be securely attached onto the protective cover.

When the standpipe is completed it shall be checked for obstructions by dropping a weighted line through the pipe. The standpipe shall then be filled with water and periodic readings made of the water level until the groundwater level is stabilized. Hydrostatic time lag required for equalization will be provided by the Geotechnical report. If required, the standpipe shall be flushed and retested at the direction of the Engineer. Groundwater readings shall be provided to the Engineer.

Standpipe piezometers, and cover pipes shall be protected during construction operations and during the monitoring of the fill. In the event of damage, fill construction shall be suspended in this area until the piezometer is restored.

(b) Readings and Maintenance of Piezometer

The Engineer will conduct and record all observations and measurements required to determine natural groundwater elevations and pore pressures induced by embankment construction. Monitoring intervals will be once every day for the first seven days, once every other day for the next eight, and then, once every three days through the end of construction of the fill. The elevation of the natural groundwater existing at the time of installation, prior to placement of any fill, will be used as a reference to determine baseline pore pressures. Groundwater and pore pressure test results will be made available to the Contractor.

The pore pressure measurement in conjunction with the settlement data will be sent electronically to the Department's Geotechnical Engineering Division within one day of the readings, and will be subject to approval. If it is determined that pore-water pressures have not sufficiently dissipated, fill placement shall be suspended, and the monitoring period extended as directed.

If monitoring is to be continued after paving in a traffic accessible area, then the pipe shall be cut off 6 in. below the finished grade and a handhole in accordance with 807.09, shall be installed for monitoring access. When the evaluation is completed, the water monitoring borehole and piezometers shall be backfilled with bentonite-cement grout.

204.0~~5~~*6* Method of Measurement

Settlement plates, settlement stakes, lateral stakes, *vibrating wire settlement systems,* standpipe piezometers, and water monitoring boreholes will be measured by the number of units installed *and accepted*.

204.0~~6~~*7* Basis of Payment

Settlement plates, settlement stakes, lateral stakes, *vibrating wire settlement systems,* standpipe piezometers, and water monitoring boreholes will be paid for at the contract unit price per each.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Settlement Plate	EACH
Stake, Lateral	EACH
Stake, Settlement	EACH
Standpipe Piezometer	EACH
Vibrating Wire Settlement System	*EACH*
Water Monitoring Borehole	EACH

The cost of furnishing, installing, and maintaining settlement plates, extension

pipes, cover pipes, B borrow, structure backfill, coarse aggregate and all necessary incidentals shall be included in the cost of settlement plates.

The cost of furnishing all tools, labor, and materials necessary to complete the installation, maintenance, and baseline reading of vibratory wire settlement systems as specified by the manufacturer shall be included in the cost of the vibratory wire settlement system pay item.

The cost of backfilling water monitoring boreholes will be included in *the* cost of water monitoring boreholes.

The cost of handholes, protective covers, bentonite chips, bentonite-cement grout, Ottawa sand, tips, casing, drilling, tubing or PVC pipe, backfilling and measurements will be included in the cost of standpipe piezometers.

No additional compensation will be made for any costs incurred related to the repair of settlement plates, pipes, settlement stakes, lateral stakes, *vibratory wire settlement systems,* or standpipe piezometers as the result of damage by the Contractor.

No payment will be made for unacceptable settlement ~~systems:~~plates, pipes, settlement stakes, lateral stakes, vibratory wire settlement systems, or standpipe piezometers. No payment will be made for delays and expenses incurred by the Contractor, through changes necessitated by improper or unacceptable installation, material or equipment.

COMMENTS AND ACTION

SECTION 204 – GEOTECHNICAL INSTRUMENTATION

DISCUSSION:

Mr. Reilman introduced and presented this item, assisted by Mr. Siddiki, stating that many settlement plates often become damaged during construction of embankments. Once damaged, the settlement plate may not be able to be repaired.

Mr. Reilman proposed to add Vibrating Wire Settlement Systems as a geotechnical instrument in the 204 section, to offer an alternative to settlement plates.

Mr. Koch asked if the qualified geotechnical consultant specified to install the devices is the same folks listed on our general Qualified Geotechnical Consultants list? Or is this a special expertise? Clarification has been added.

Mr. Koch suggested adding the language for "damaged devices" in the Basis of Payment to make that language stronger since the need for the process is due to damaged plates during the various construction activities. This, and other minor revisions are as shown.

Mr. Novak and Mr. Pankow asked if we need to specify the make and model, or can we just specify the requirements. Mr. Siddiki said he can provide that information later, but suggested to leave as is for now. Upon further discussion, the language was revised to reference the QPL, which will be created by Mr. Siddiki.

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

COMMENTS AND ACTION

SECTION 204 – GEOTECHNICAL INSTRUMENTATION

[continued]

Motion: Mr. Reilman Second: Mr. Koch Ayes: 9 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 204 begin pg 186.	___ 2024 Standard Specifications _X_ Revise Pay Items List
Recurring Special Provision references in: NONE	_X_ Create RSP (No. 204-R-xxx) Effective: December 1, 2021 RSP Sunset Date:
Standard Drawing affected: NONE	___ Revise RSP (No.___) Effective: RSP Sunset Date:
Design Manual Sections affected: NONE	___ Standard Drawing Effective:
GIFE Sections cross-references: NONE	___ Create RPD (No. ___) Effective:
	_X_ GIFE Update __ Frequency Manual Update _X_ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: B borrow did not have a reference in the 904 (materials) section. There weren't any testing requirements specified for B borrow. Lastly, when B borrow is used within the free water level, ACBF and GBF may cause issues.

PROPOSED SOLUTION: The B borrow description in section 211.02 was moved to 904.06. In addition, testing methods were added to 904.06. Restrict the use of ABCF and GBF in B borrow applications.

APPLICABLE STANDARD SPECIFICATIONS: 202, 203, 204, 206, 211, 701, 904

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: Yes

APPLICABLE RECURRING SPECIAL PROVISIONS: NA

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT: District Testing Engineers

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman for Nayyar Siddiki

Title: State Materials Engineer

Organization: Division of Materials & Tests

Phone Number: 317-522 9692

Date: 04/21/2021

Mr. Reilman
Date: 5/20/21

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? NA

Construction time? NA

Customer satisfaction? NA

Congestion/travel time? NA

Ride quality? NA

Will this proposal reduce operational costs or maintenance effort? NA

Will this item improve safety:

For motorists? NA

For construction workers? NA

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? NA

Design process? Yes

Will this change provide the contractor more flexibility? NA

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

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

Is this proposal needed for compliance with:

Federal or State regulations? NA

AASHTO or other design code? NA

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 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 202, BEGIN LINE 401, DELETE AND INSERT AS FOLLOWS:

(p) backfill excavations in an approved manner. Backfill shall be B borrow in accordance with ~~211~~*904.06 with the exception that B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level;*

SECTION 203, BEGIN LINE 385, DELETE AND INSERT AS FOLLOWS:

When free water is encountered, backfilling shall be accomplished using B borrow, in accordance with ~~211.02,~~*904.06 with the exception that ACBF or GBF shall not be used. Backfilling using B borrow shall occur* 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 *without ACBF or GBF* shall be placed below the free water level. Backfill at structures shall be in accordance with 211.04.

SECTION 203, BEGIN LINE 690, DELETE AND INSERT AS FOLLOWS:

If water is present, the backfill shall be with material in accordance with 211.02, *with the exception that ACBF or GBF shall not be used*. Placement of this material shall follow as closely behind the removal of the peat as possible. It shall be carried across the area from one end to the other by end-dumping and finally left at the established grade. This grade shall be such that keeps end-dumping to a minimum, which nominally shall be approximately 2 ft above free water level. That portion between free water level and this established grade shall be thoroughly water soaked to secure maximum compaction.

SECTION 203, BEGIN LINE 777, DELETE AND INSERT AS FOLLOWS:

Recycled concrete pavement ~~may be used in embankment construction. The recycled material~~ shall meet the *gradation* requirements of B borrow in accordance with ~~211.02~~*904.06* ~~or rock embankment~~. *Construction requirements shall be* in accordance with 203.20*(a), or 211.03.*

SECTION 204, BEGIN LINE 10, DELETE AND INSERT AS FOLLOWS:

REVISION TO STANDARD SPECIFICATIONS

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

204.02 Materials
Materials shall be in accordance with the following:

B Borrow.....~~211.02~~*904.06*

SECTION 206, BEGIN LINE 119, INSERT AS FOLLOWS:

206.07 Disposal of Excavated Material

Except as otherwise herein provided, material excavated for a structure or its approaches, including any material excavated beyond the pay limits of foundation excavation or its specified or approved extensions, shall, if suitable, be used for filling around the new structure, for spandrel filling, approach embankment, regular embankment, or for any combination of these, all as specified or directed.

If excavated material, is in accordance with 211.02, and if material of this nature is required at the structure or in its approaches, then this material shall be used as special fill and placed in accordance with the applicable provisions of 211. *B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

SECTION 211, BEGIN LINE 11, DELETE AND INSERT AS FOLLOWS:

211.02 Materials
Materials shall be in accordance with the following:

B Borrow.....~~As Defined*~~*904.06*
Flowable Backfill.....213
Geotextile.....918.02
Structure Backfill.....904.05

~~*The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, crushed stone, ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the No. 200 (75 µm) sieve and shall be otherwise suitably graded. The use of an essentially one size material will not be allowed unless approved.~~

Aggregate for end bent backfill shall be No. 8 or No. 9 crushed stone or ACBF, class D or higher.

SECTION 211, BEGIN LINE 81, INSERT AS FOLLOWS:

Where B borrow or structure backfill is required as backfill at culverts, retaining

REVISION TO STANDARD SPECIFICATIONS

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

walls, sewers, manholes, catch basins, and other miscellaneous structures, it shall be compacted in accordance with 211.04. *B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

SECTION 701, BEGIN LINE 13, DELETE AND INSERT AS FOLLOWS:

701.02 Materials

Materials shall be in accordance with the following:

B Borrow	~~211~~*904.06**
Bentonite Grout	913.06
Concrete Piles	707
Conical Pile Tips	915.01(a)2
End Plates	915.01(a)1
Epoxy Coating for Piles	915.01(d)
Pile Shoes	915.03
Reinforcing Bars	910.01
Steel H Piles	915.02
Steel Pipe Piles	915.01
Structural Concrete	702
Timber Piling, Treated	911.02(c)
Timber Piling, Untreated	911.01(e)

* *B borrow consisting of ACBF or GBF shall not be used.*

Unless otherwise specified, reinforcing bars may be either plain or epoxy coated.

SECTION 715, BEGIN LINE 24, DELETE AND INSERT AS FOLLOWS:

Materials shall be in accordance with the following:

B Borrow	~~211~~*904.06**
Concrete	702
Flowable Backfill	213
Geotextiles	918.02
Pipe Joint Sealant	907.11
Reinforcing Bars	910.01
Rubber Type Gaskets	907.13
Straps, Hook Bolts, and Nuts	908.12
Structure Backfill	904

** B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

REVISION TO STANDARD SPECIFICATIONS

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

The maximum particle size of backfill material for corrugated pipe shall be less than 1/2 the corrugation depth.

SECTION 904, BEGIN LINE 157, DELETE AND INSERT AS FOLLOWS:

(f) Mineral Filler for SMA

Mineral filler shall consist of dust produced by crushing stone, portland cement, or other inert mineral matter having similar characteristics. Mineral filler shall be in accordance with the gradation requirements of 904.02(h) for size No. 16 or as approved by the Engineer. Mineral filler shall be in accordance with ITM 203 or from an ACBF slag source. The sieve analysis of mineral filler shall be conducted in accordance with AASHTO T 37 except as noted in 904.0~~6~~7. Mineral filler shall be non-plastic in accordance with AASHTO T 90.

SECTION 904, BEGIN LINE 280, DELETE AND INSERT AS FOLLOWS:

(f) Sampling and Testing

Sampling and testing will be in accordance with the following AASHTO, ASTM, and ITMs.

Amount of Material finer than No. 200 (75 µm) Sieve*	AASHTO T 11
Brine Freeze and Thaw Soundness	ITM 209
Clay Lumps and Friable Particles	AASHTO T 112
Control Procedures for Classification of Aggregates	ITM 203
Crushed Particles	ASTM D5821
Dolomite Aggregates	ITM 205
Flat and Elongated Particles	ASTM D4791
Freeze and Thaw Beam Expansion	ITM 210
Lightweight Pieces in Aggregates*	AASHTO T 113
Los Angeles Abrasion	AASHTO T 96
Micro-Deval Abrasion	AASHTO T 327
Polished Resistant Aggregates	ITM 214
Sampling Aggregates*	AASHTO T 2
Sampling Stockpiled Aggregates	ITM 207
Scratch Hardness	ITM 206
Sieve Analysis*	AASHTO T 27
Soundness*	AASHTO T 103,

REVISION TO STANDARD SPECIFICATIONS

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

	AASHTO T 104
Specific Gravity and Absorption*	AASHTO T 85
Unit Weight and Voids in Aggregates	AASHTO T 19

*Except as noted in ~~904.06~~*904.07*

SECTION 904, BEGIN LINE 359, DELETE AND INSERT AS FOLLOWS:

904.06 B Borrow

The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, or crushed stone ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the No. 200 (75 µm) sieve and shall be otherwise suitably graded. The ratio of the fraction passing the No. 200 (75 µm) sieve to the fraction retained on the No. 30 (600 µm) sieve shall not exceed one-fifth. The use of an essentially one-size material will not be allowed unless approved. B borrow containing greater than 3% by dry weight organic material will not allowed.

Sieve analysis and organic material will be performed in accordance with AASHTO T 11 and AASHTO T 267.

904.0~~6~~*7* Exceptions to AASHTO Standard Methods

(a) Exceptions to AASHTO T 2

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

COMMENTS AND ACTION

SECTION 202- REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

DISCUSSION:

This item was introduced and presented by Mr. Reilman, assisted by Mr. Siddiki, who explained that B borrow did not have a reference in the 904 materials section. There weren't any testing requirements specified for B borrow. And when B borrow is used within the free water level, ACBF and GBF may cause issues.

Mr. Reilman proposed to move the B borrow description in 211.02, to 904.06. Also, testing methods were added to 904.06 in order to restrict the use of ABCF and GBF in B borrow applications.

Mr. Koch pointed out that the proposed revisions in 203.18, beginning line 777, are now in conflict with the proposed revised language in the item 1 proposal. Further, Mr. Koch asked if we should also update the reference to 904.06 in 904.02(f). That language, along with other minor editorial revisions, have been corrected as shown.

Mr. Fisher suggested updating information for AASHTOWare.

With no further discussion, this item passed as revised.

COMMENTS AND ACTION

SECTION 202- REMOVAL OF STRUCTURES AND OBSTRUCTIONS
SECTION 203 - EXCAVATION AND EMBANKMENT
SECTION 204 - GEOTECHNICAL INSTRUMENTATION
SECTION 206 - STRUCTURE EXCAVATION
SECTION 211 - B BORROW AND STRUCTURE BACKFILL
SECTION 701 - STRUCTURES
SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
SECTION 904 - AGGREGATES

[continued]

Motion: Mr. Reilman Second: Mr. Novak Ayes: 9 Nays: 0 FHWA Approval: YES	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected:	_X_ 2024 Standard Specifications ___ Revise Pay Items List
Recurring Special Provision references in: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_X_ Create RSP (No. TBD-x-xxx) Effective: December 1, 2021 RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: _X_ GIFE Update __ Frequency Manual Update _X_ SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Conflicting guidance for geosynthetic uses within the specifications.

PROPOSED SOLUTION: Specify use of Geogrid, Type IB in section 610. Create a new section for moisture management in section 918. Revise guidance in 214, clarify geosynthetic types and construction requirements based on the application. Remove conflicting guidance and made additional clarifications in 207-R-687.

APPLICABLE STANDARD SPECIFICATIONS: 207, 214, 918, 610

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: Yes

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc: Youlanda Belew, Kumar Dave, Victoria Leffel, Jim Reilman, Nayyar Siddiki, Matt Thomas

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman for Nayyar Siddiki

Title: State Materials Engineer

Organization: Division of Materials and Tests

Phone Number: 317-522 9692

Date: 04/21/2021

Mr. Reilman
Date: 5/20/21

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? NA

Customer satisfaction? NA

Congestion/travel time? NA

Ride quality? NA

Will this proposal reduce operational costs or maintenance effort? NA

Will this item improve safety:

For motorists? NA

For construction workers? NA

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? NA

Design process? Yes

Will this change provide the contractor more flexibility? NA

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

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

Is this proposal needed for compliance with:

Federal or State regulations? NA

AASHTO or other design code? NA

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 – GEOSYNTHETICS (214.02, 214.03, 214.04, 214.05, 214.06)
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 214, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

214.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate.....904.03*
Geocell Confinement System.....918.04
Geogrid.....918.05
Geotextile ~~for Pavement and Subgrade~~.....918.02

~~Notes: Coarse Aggregate~~ **Only* No. 2, 5, 43, 53, 73, shall be used ~~only~~. ACBF ~~Slag~~ shall not be ~~allowed~~*used*.

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 embankment foundation soils shall be prevented where possible and shall otherwise be minimized. Fine grading may be waived where impractical. 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 geosynthetics. Proofrolling of the embankment foundation will not be required in accordance with 203.09 when 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. Geotextile shall be placed taut and transversely after backfilling all wheel tracks. Geotextile shall be 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 over previously placed material with light equipment in such a manner as to prevent damage to the geotextile. Dumping of coarse aggregate will be allowed on *the* initial working platform. The overlap shall be staggered throughout the roadway profile. Coarse aggregate shall be

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS (214.02, 214.03, 214.04, 214.05, 214.06)
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

placed to the full required thickness and compacted before any loaded trucks are allowed on the blanket. The drainage blanket shall have positive drainage.

No vehicles or construction equipment ~~shall~~*will* 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 Placement for 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 for pavement, subgrade, or embankment shall be in accordance with 918.02(c).*

When geotextile for moisture management is specified, the grade shall be prepared in such a way as to provide positive drainage. The surface shall be prepared in accordance with 201.03 and compacted in accordance with 203.23. All rocks shall be broken and compacted in accordance with 203.24. Geotextiles shall be placed taut, without wrinkles, in accordance with the manufacturer's guidelines, as shown on the plans, or as specified. ~~The specified subgrade treatment type, base, subbase, or other granular material shall be placed on top of the geotextile.~~ Damaged geotextile shall be replaced. Geotextile ~~type IA,~~ for moisture management~~,~~ shall be in accordance with 918.02(d).

Geotextile shall be covered within three calendar days of placement.

(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~~ g*G*eogrid shall be used for embankment foundation treatment. ~~Type IB geogrid shall be used for subgrade treatment, type IV.~~ When placing ~~type IA~~ geogrid *in the embankment foundation*, ~~any~~ rutting in the granular material shall not exceed 3 in.~~ in the embankment foundation.~~ 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~~*specified for subgrade*, 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 s~~Spreading and compaction of the aggregate shall be performed so that ~~adequate interlocking of~~ the aggregate and geogrid ~~is obtained~~*interlock*. The second 6 in. of coarse aggregate No. 53 shall be constructed in accordance with 301.

When geogrid is specified for subbase or base applications, geogrid shall be placed as shown ~~in~~ on the plans and in accordance with the manufacturer's guidelines.

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

The geogrid shall be overlapped a minimum of 2 ft side to side and end to end for *subgrade, subbase, and base applications* ~~type IB~~. ~~The type IA g~~*G*eogrid~~s~~ shall be overlapped 3 ft in areas where foundation conditions cannot support foot traffic or where 2 ft is found to be inadequate during fill placement. Overlap~~s~~ shall be oriented in the direction of fill placement, or shingled, to prevent advancing fill from lifting any geogrid roll edges. Overlaps shall be further secured to prevent separation during fill placement. Damaged geogrid shall be patched. Patching shall include placement of a minimum of 3 ft of overlapped geogrid beyond the damaged area. If the damaged portion extends for more than 50% of the roll in the width direction, the entire width shall be replaced.

Geogrid shall be covered with fill within three calendar days after placement. Only that amount of geogrid required for pending work shall be placed to minimize exposure of the geogrid.

(d) Geocell Confinement System

The Contractor shall construct the grade in accordance with 203. A layer of geotextile shall be placed in accordance with 214.03(b) and shall be anchored at the roadway edge when widening or when intersecting an existing roadway. The geocell confinement system, GCS, shall be placed and anchored as shown on the plans, or as directed. The Contractor shall ensure that the GCS is anchored vertically and the geocell shall be filled with a minimum of ~~3~~*4* in. of coarse aggregate No. 5, No. 8, or No. 43. If the Contractor chooses No. 5 or No. 8, geotextile in accordance with 918.02(a), Type 1B shall be placed on the GCS before placing No. 53 or No. 73. The GCS shall be oriented with the

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS (214.02, 214.03, 214.04, 214.05, 214.06)
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

smaller cell dimension perpendicular to the roadway. The remaining GCS shall be filled with ~~No. 53 or No. 73 and~~ at least ~~9~~*8* in. of No. 53 or No. 73. ~~shall be placed on the GCS.~~ The aggregate shall be back dumped and compacted with a light roller in accordance with 301. No trucks or construction vehicles ~~shall~~*will* be allowed on the GCS. A light tracked bulldozer or other equipment may be used as directed. ~~A~~ *The* 6 in. lift above GCS shall be compacted with low frequency and amplitude, with a minimum of six passes. The remaining aggregate shall be placed and compacted lightly at first, then with high amplitude. Efforts shall be made to ensure that the geotextile and GCS are in tension. ~~The Contractor may propose an alternate means of providing a typical section for the GCS, and shall submit the proposal to the Engineer for review and approval. The proposal shall be certified by a professional engineer registered in the State of Indiana.~~

The Contractor may propose an alternate means of providing a typical section for the GCS, and shall submit the proposal to the Engineer for review and approval. The proposal shall be certified by a professional engineer registered in the State of Indiana.

GCS shall be constructed in accordance with 207 and 214.

214.04 Fill Placement

Construction vehicles ~~shall~~*will* not be *allowed* on the ~~geogrid~~*geosynthetic*. The placement of the fill shall proceed forward along the roadway centerline and outward to the embankment edges and compacted in accordance with 203.23. The Engineer may waive density requirements for the first lift of embankment foundation treatment if the fill is determined to be too weak to support compaction equipment.

214.05 Method of Measurement

Geotextile for pavement, ~~and~~ subgrade, *embankment, and moisture management* 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 geosynthetics shown on the plans. The aggregate used for the embankment foundation improvement will be measured in accordance with 301.09. The geogrid reinforced subgrade, *GCS, and the excavation required to place the GCS* will be measured in accordance with 207.05.

~~The GCS and the excavation required to place the GCS will not be measured.~~ ~~*Geosynthetics for subgrade treatment will not be measured.*~~

214.06 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

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS (214.02, 214.03, 214.04, 214.05, 214.06)
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

in accordance with 301.10. The geogrid reinforced subgrade will be paid for in accordance with 207.06.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Geogrid, _____ type	SYS
Geotextile for Moisture Management, _____ type	SYS
Geotextile for Pavement, _____ type	SYS
~~Geotextile for Subgrade, _____ type~~	~~SYS~~

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.

The geocell confining system, anchors, restraint clips, pins, necessary incidentals required to provide a complete in place system, and the Type IB geotextile if required for the GCS, shall be included in the cost of subgrade treatment in accordance with 207.06.

~~*Geosynthetics for subgrade treatment will shall be included in the cost of the subgrade treatment.*~~

SECTION 610, BEGIN LINE 12, INSERT AS FOLLOWS:

610.02 Materials

Materials shall be in accordance with the following:

Aggregate Base	301.02
Geogrid, Type IB	*918.05*
HMA	402.03
PCCP	502.02
Prime Coat	405.02
Seal Coat	404
Subbase	302.02
Tack Coat	406.02

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS (214.02, 214.03, 214.04, 214.05, 214.06)
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

SECTION 610, BEGIN LINE 43, INSERT AS FOLLOWS:

610.05 Method of Measurement

Compacted aggregate base will be measured in accordance with 301.09. HMA mixture for approaches will be measured by the ton of the type specified, in accordance with 109.01(b). Dense graded subbase will be measured in accordance with 302.08. PCCP for approaches will be measured by the square yard of the thickness specified. Subgrade treatment will be measured in accordance with 207.05.

HMA patching in accordance with 610.04, will be measured by the ton in accordance with 304.06. PCCP patching in accordance with 610.04, will be measured by the square yard in accordance with 305.06. *Geogrid Type IB will be measured in accordance with 214.05.*

Prime coat will be measured in accordance with 405.09. Tack coat will be measured in accordance with 406.06. Seal coat will be measured in accordance with 404.13.

610.06 Basis of Payment

The accepted quantities of HMA mixture for approaches will be paid for at the contract unit price per ton of the type specified, complete in place. Compacted aggregate base will be paid for in accordance with 301.10. PCCP for approaches will be paid for at the contract unit price per square yard of the thickness specified, complete in place. Dense graded subbase will be paid for in accordance with 302.09. Subgrade treatment will be paid for in accordance with 207.06. *Geogrid Type IB will be paid for in accordance with 214.06.*

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

SECTION 918, BEGIN LINE 35, DELETE AND INSERT AS FOLLOWS:

(b) Geotextile Properties for Underdrains, *Subsurface Drains,* and ~~Drainage~~*Filtration* Applications

		Requirements[1] [2]				
Test	Method, ASTM	Type 1A	Type 1B	Type 2A	Type 2B	Type 3
Grab Tensile Strength, min.	D4632	80 lb	200 lb	160 lb	200 lb	200 lb
Grab Elongation	D4632	> 50%	< 50%	> 50%	< 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb	1,100 lb
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained	90% strength retained
A	D4751	≤ No. 50 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 40 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 70 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 30 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 40 sieve
Permittivity	D4491	≥ 1.2 sec^{-1}	≥ 2.1 sec^{-1}	≥ 0.8 sec^{-1}	≥ 0.9 sec^{-1}	0.90 sec^{-1}

Notes:
[1] All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.
[2] Type 3 value is a maximum average roll value (Max ARV) as determined in accordance with ASTM D4354.

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

(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.	D4632	200 lb	300 lb	290 lb	400 lb
Wide Width Tensile , @ 5% Strain, min.	D4595	n/a	n/a	1,200 lb/ft	2,400 lb/ft
Grab Elongation	D4632	≤ 50%	< 50%	≤ 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb
Trapezoid Tearing Strength, min.	D4533	75 lb	110 lb	n/a	n/a
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained
Apparent Opening Size, AOS, min.	D4751	No. 50 sieve	No. 40 sieve	No. 30 sieve	No. 30 sieve
Soil Retention, Pore Size, O_{50}/O_{95}, min.	D6767	n/a	n/a	290/380	100/350
Permittivity, min.	D4491	0.05 sec^{-1}	0.050 sec^{-1}	0.50 sec^{-1}	0.40 sec^{-1}

Note:
(1) All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

(d) Geotextile Properties for Moisture Management

Type, 1MA geotextile shall consist of woven polypropylene filaments, wicking filaments and shall be in accordance with the following:

		Requirements
Test	*Method, ASTM*	*Type 1MA*
Wide Width Tensile Strength, min. *Machine direction* *Cross machine direction*	*D4595*[3]	 *5,280 lbs/ft* *5,280 lbs/ft*
Wide Width Tensile Strength, @ 2% Strain, min. *Machine direction* *Cross machine direction*	*D4595*[3]	 *480 lbs/ft* *1,080 lbs/ft*
Apparent Opening Size, AOS, min.	*D4751*	*No. 40 sieve*
Flow Rate	*D4491*[3]	*30 gal./min/ft*^{2}
Wicking Requirement *Wet Front Movement*[1] *24 minutes, min.*	*C1559*[2]	*6 in.* *Vertical Direction*
Wicking Requirement *Wet Front Movement*[1] *983 minutes. Zero Gradient, min.*	*C1559*[2]	*73 in.* *Horizontal Direction*
Permittivity, min.	*D4491*[3]	*0.4 sec*$^{-1}$

Notes:
1. 'STP': Standard Temperature and Pressure
2. Modified, time
3. Minimum average roll values shall be in accordance with ASTM D4759

REVISION TO STANDARD SPECIFICATIONS

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

(~~d~~*e*) Geotextile Properties for Silt Fence

		Requirements[1]	
Test	Method, ASTM	Wire Fence Supported	Self Supported
Grab Strength	D4632	90 lb	90 lb
Elongation @ 45 lb	D4632		50% max.
Apparent Opening Size [2]	D4751	No. 20 sieve	No. 20 sieve
Permittivity [2]	D4491	0.01 sec^{-1}	0.01 sec^{-1}
Ultraviolet Degradation at 500 hrs	D4355	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 D4354.

[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.

Note: All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354.

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~~*manufacturer* shall submit the tests for the intended use to the Department.

SECTION 918, BEGIN LINE 72, INSERT AS FOLLOWS:

918.05 Geogrid

Geogrid shall be *a* biaxial or multi axial of a regular network of connected polymer tensile elements with aperture geometry sufficient to enable significant mechanical interlock with the surrounding material. The material shall be polypropylene, ASTM D 4101 (97% minimum) and Carbon Black, ASTM D 1603 (0.5% minimum). The geogrid structure shall be dimensionally stable and shall be able to retain its geometry under construction stresses. The geogrid structure shall have a resistance to damage during construction, ultraviolet degradation, and all forms of chemical and biological degradation encountered in the soil being placed.

COMMENTS AND ACTION

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

DISCUSSION:

Mr. Reilman introduced and presented this item, with Mr. Siddiki, who explained that there is conflicting guidance for geosynthetic uses within the specifications.

Mr. Reilman proposed to specify the use of Geogrid, Type IB in 610, create a new section for moisture management in 918, revise guidance in 214, clarify geosynthetic types and construction requirements based on the application, and remove conflicting guidance and make additional clarifications in RSP 207-R-687.

Revisions recommended by the geotechnical department, along with some minor edits, are as shown.

Mr. Osborn and Ms. Bidlack, ICI, inquired about the moisture management with regard to material placement. Clarification was provided by Mr. Siddiki. Further revisions were incorporated following more detailed discussions with regard to the pay items and types of geotextiles.

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

COMMENTS AND ACTION

SECTION 214 – GEOSYNTHETICS
SECTION 610 - APPROACHES AND CROSSOVERS (610.02, 610.05, and 610.06)
SECTION 918 - GEOSYNTHETIC MATERIALS (918.02, 918.03, and 918.05)

[continued]

Motion: Mr. Reilman Second: Mr. Dave Ayes: 9 Nays: 0 FHWA Approval: Yes	Action:	
	___	Passed as Submitted
	X	Passed as Revised
	___	Withdrawn
Standard Specifications Sections referenced and/or affected:	X	2024 Standard Specifications
	X	Revise Pay Items List
Recurring Special Provision references in: NONE	X	Create RSP (No. TBD) Effective: December 1, 2021 RSP Sunset Date:
Standard Drawing affected: NONE	___	Revise RSP (No.___) Effective: RSP Sunset Date:
Design Manual Sections affected: NONE	___	Standard Drawing Effective:
GIFE Sections cross-references: NONE	___	Create RPD (No. ___) Effective:
	X	GIFE Update
	X	Frequency Manual Update
	X	SiteManager Update