Iowa Department of Transportation

MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING

August 8, 2013

Members Present:	Darwin Bishop	District 3 - Construction
	Mark Brandl	District 6 - Davenport RCE
	Donna Buchwald	Office of Local Systems
	Eric Johnsen, Secretary	Specifications Section
	Wes Musgrove	Office of Contracts
	Gary Novey	Office of Bridges & Structures
	Dan Redmond	District 4 - Materials
	Willy Sorensen	Office of Traffic & Safety
Members Not Present:	Sandra Larson	Systems Operations Bureau
	Greg Mulder	Office of Construction & Materials
	Tom Reis, Chair	Specifications Section
	Brian Smith	Office of Design
Advisory Members Present:	Lisa McDaniel	FHWA
Others Present:	Wayne Sunday	Office of Construction & Materials
	Bob Dawson	Office of Construction & Materials
	Mark Bortle	Office of Construction & Materials
	Scott Schram	Office of Construction & Materials
	Daniel Harness	Office of Design
	Jacqui Miskimins	Office of Employee Services

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed in accordance with the agenda dated July 31, 2013:

1. Article 1109.05, B, 4, a, Prompt Payment to Subcontractors.

The Office of Employee Services - Civil Rights Team requested revisions to comply with FHWA requirements.

2. Article 2413.03, F, 1, Curing (Bridge Deck Surfacing, Repair, and Overlay).

The Office of Construction and Materials requested to clarify that only a single layer of burlap is required for curing bridge deck overlays.

3. Article 2413.03, H, 9, Limitations of Operations (Bridge Deck Surfacing, Repair, and Overlay).

The Office of Construction and Materials requested to remove a requirement that should have been previously deleted.

4. Article 2513.03, A, 2, b, 1, Cast-in-Place and Slip Form (Concrete Barrier).

The Office of Construction and Materials requested to remove the cement content requirement for barrier concrete.

5. **Section 2523, Highway Lighting.**

Section 4185, Highway Lighting Materials.

The Offices of Design and Traffic & Safety requested revisions to bring these sections up to date with current code and practice.

6. **Article 4118.03, Quality (Pipe Bedding Material).**

The Office of Construction and Materials requested to revise the freeze-thaw requirements for pipe bedding material.

7. **SS-12003, Polymer Modified Microsurfacing.**

The Office of Construction and Materials requested revisions to the Supplemental Specifications for Polymer Modified Microsurfacing to allow local limestone and dolomite to be used.

8. **DS-12017, Temporary Lane Separator System.**

The Office of Construction and Materials requested updates to the Developmental Specifications for Temporary Lane Separator System.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jacqui Miskimins	**Office:** OES, Civil Rights Team	**Item 1**
Submittal Date: 7/9/2013	**Proposed Effective Date:** April 2014	
Article No.: 1109.05, B **Title:** Prompt Payment to Subcontractors	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 4/15/2014

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The District 6 Office asked what would keep the subcontractor from pocketing the money and not passing it on to the supplier. The check is a joint check that both parties have to endorse.

Specification Section Recommended Text:

1109.05, B, 4, a.

Replace the Article:

The request for a joint check from the prime contractor is made by the ~~materials supplier~~ subcontractor.

Comments:

Member's Requested Change: **(Do not use 'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and Highlight.)**

1109.05 B

4. The use of joint checks for payment to subcontractors for their materials is acceptable under the following conditions:

a. The request for a joint check from the prime contractor is made by the ~~materials supplier~~ subcontractor.

b. The joint check issued by the prime contractor is for an amount not to exceed the cost of unpaid invoice(s) from the materials supplier to a subcontractor on that contract.

c. The joint check is given to the subcontractor and the subcontractor must release the joint check to the material supplier.

d. The use of a joint check by the prime contractor is applicable to all their subcontractors.

Reason for Revision: To comply with FHWA requirements.

County or City Input Needed (X one)	**Yes**	**No** X
Comments:		
Industry Input Needed (X one)	**Yes**	**No** X

Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Wayne Sunday	**Office:** Construction & Materials	**Item 2**
Submittal Date: 2013.05.15	**Proposed Effective Date:** April 15, 2014	
Article No.: 2413.03, F **Title:** Curing (Bridge Deck Surfacing, Repair, and Overlay)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 4/15/2014

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2413.03, F, 1.

Replace the Article:

Place ~~the first~~ a single layer of prewetted burlap on the concrete as follows:

a. Interstate and Primary Projects.
Place within 10 minutes after finishing. If Class O PCC is revibrated because of failure to meet density requirements with initial vibration, place the prewetted burlap within 10 minutes after finishing of the revibrated area.

b. Other Projects.
Immediately after final finishing, cover the area finished with white pigmented curing compound meeting the requirements of Article 4105.05, applied at a rate of no more than 135 square feet per gallon (3.3 square meters per liter). Place the ~~first layer of~~ prewetted burlap on the concrete within 30 minutes after the concrete has been deposited on the deck. If Class O PCC is revibrated because of failure to meet density requirements with initial vibration, this time limit will be extended by 15 minutes.

Comments:

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'.Use ~~Strikeout~~ and Highlight.

F. Curing.
1. Place a single ~~the first~~ layer of prewetted burlap on the concrete as follows:
a. Interstate and Primary Projects.
Place within 10 minutes after finishing. If Class O PCC is revibrated because of failure to meet density requirements with initial
vibration, place the prewetted burlap within 10 minutes after finishing of the revibrated area.
b. Other Projects.
Immediately after final finishing, cover the area finished with white pigmented curing compound meeting the requirements of Article 4105.05, applied at a rate of no more than 135 square feet per gallon (3.3 square meters per liter). Place a single ~~the first~~ layer of prewetted burlap on the concrete within 30 minutes after the concrete has been deposited on the deck. If Class O PCC is revibrated because of failure to meet density requirements with initial vibration, this time limit will be extended by 15 minutes.

Reason for Revision: The current specification referred to the first layer of burlap which appears to imply that there is an intent for a second layer of burlap. Unlike bridge deck placements, bridge deck overlays have only required one layer of prewetted burlap with continuous wet sprinkling to maintain wet cure. This specification revision is to provide a clarification that only a single layer of burlap is required.

County or City Input Needed (X one)	**Yes**	**No**

Comments:

Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Wayne Sunday	**Office:** Construction & Materials	**Item 3**
Submittal Date: 2013.05.15	**Proposed Effective Date:** April 15, 2014	
Article No.: 2413.03, H **Title:** Limitations of Operations (Bridge Deck Surfacing, Repair, and Overlay)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 4/15/2014

Specification Committee Approved Text:

2413.03, H, 9.

Replace the third sentence:

If this work is started before the end of the 72 hour curing period ~~or 168 hour curing period for Class HPC-O projects with greater than 1800 square yards (1500 m^2)~~ or the cure period specified in the contract documents, the work will be restricted as follows:

Comments: Language was added to indicate that the contract documents may include a longer curing period. The longer curing period may be included in cases where traffic is not affected.

Specification Section Recommended Text:

2413.03, H, 9.

Replace the third sentence:

If this work is started before the end of the 72 hour curing period ~~or 168 hour curing period for Class HPC-O projects with greater than 1800 square yards (1500 m^2)~~, the work will be restricted as follows:

Comments:

Member's Requested Change: **(Do not use 'Track Changes', or 'Mark-Up'.Use ~~Strikeout~~ and Highlight.**

9. Preparation work will not be allowed in a lane or strip until the lane is closed to traffic. In areas where there is no traffic, preparation of the area may be started in a lane or strip adjacent to newly placed surface the day following its placement. If this work is started before the end of the 72 hour curing period ~~or 168 hour curing period for Class HPC-O projects with greater than 1800 square yards (1500 m_2),~~ the work will be restricted as follows:

a. Limit the interference sawing, or other operations, has on curing to the minimum time practical, and to the immediate area only. Resume curing promptly.

b. Do not use chipping hammers heavier than a nominal 15 pound (with a mass greater than 7 kg) class.

c. Operate air compressors on the deck only directly over the piers.

d. Do not allow loads, other than construction equipment, on any portion of the bridge deck that has undergone preparation in advance of new concrete placement and curing.

Reason for Revision: The above 168 hour curing requirement was previously removed from the specifications, but was not also removed from the specification portion of Limitations of Operations.

County or City Input Needed (X one)	**Yes**	**No**
Comments:		

Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder	**Office:** Construction & Materials	**Item 4**
Submittal Date: 2013.07.03	**Proposed Effective Date:** April 2014	
Article No.: 2513.03, A, 2, b, 1) **Title:** Cement for Class BR (Cast-in-Place and Slip Form [Concrete Barrier])	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 4/15/2014

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2513.03, A, 2, b, 1).

Delete the Article:

~~**1) Cement for Class BR.** Use a minimum cement content of 603 pounds per cubic yard (358 kg/m3).~~

Comments:

Member's Requested Change (Redline/Strikeout):

2. Cast-in-Place and Slip Form.

a. For cast-in-place, use Class C concrete complying with Materials I.M. 529. For slip form, use Class BR complying with Materials I.M. 529.

b. Submit Class BR mix design to the District Materials Engineer for approval at least 7 calendar days prior to placement. Apply Section 2403, except meet the following mix design requirements:

~~**1) Cement for Class BR.** Use a minimum cement content of 603 pounds per cubic yard (358 kg/m3).~~

12) Water. Do not exceed Table 2513.03-2 for total mixing water and free moisture in the aggregate. Minimum slump is 1/2 inch (12.5 mm).

Table 2513.03-2: Mixing Water and Free Moisture

Class of Concrete	Pounds (kg) of Water Per Pound (kg) of Cementitious Material
BR (Slip Form)	0.450
C (Cast-in-Place)	0.488

23) Aggregates for Class BR. Use a well graded combination of aggregates complying with Materials I.M. 532 in Zone II-A or II-B. Meet requirements in Division 41 for each individual aggregate used.

34) Admixtures. Use air entrainment. Use 7% as a target value for the air content of fresh, unvibrated concrete, with a maximum variation of plus 1.5% or minus 1.0%. To improve workability and aid in air entrainment, water reducing or retarding admixtures may be used according to Article 2513.02, C.

45) Fly Ash and GGBFS. Use the conditions and allowable rates of fly ash and GGBFS substitution in Table 2513.03-3:

Reason for Revision: Paragraph 2.a. states to provide a BR mix in accordance with IM 529. Paragraph 2.b.1 states a cement content of 603 lbs/yd^3. These two statements contradict each other because the mix in IM 529 is based on an absolute volume. Thus, when blended cements are used at a different specific gravity, the cement content is different than 603 lbs/yd^3. IM 529 already describes the mix design and cement content is not needed in the article. This is consistent with all other specifications regarding

concrete mixes.					
County or City Input Needed (X one)			**Yes**	**No** x	
Comments:					
Industry Input Needed (X one)			**Yes**	**No** x	
Industry Notified:	**Yes** X	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith / Willy Sorenson	**Office:** Design/Traffic and Safety	**Item 5**
Submittal Date: 7/26/2013	**Proposed Effective Date:** 4/15/2014	
Section No.: 2523 **Title:** Highway Lighting **Section No.:** 4185 **Title:** Highway Lighting Materials	**Other:**	

Specification Committee Action: This item was deferred until the next Specification Committee meeting.

Deferred: X	**Not Approved:**	**Approved Date:**	**Effective Date:**

Specification Committee Approved Text:

Comments: The Office of Traffic & Safety had some questions that will be addressed before the next meeting.

Specification Section Recommended Text:

2523.03, B, 1, a, 5).

Replace the Article:

~~Iowa DOT Standard Road Plan RM-41, Underdeck Lighting (High Pressure Sodium Luminaire)~~ Underdeck luminaires with lamps.

2523.03, B, 1, a, 6), i).

Replace the Article:

Surge ~~suppressor~~ protection device.

2523.03, B, 1, a, 7).

Replace the Article:

~~Iowa DOT Standard Road Plan RM-40,~~ Cable Splices and Connectors.

2523.03, B, 1, a.

Renumber Article 9) as Article 10).

Add the Article:

9). Anchor bolts, nuts, and washers.

2523.03, B, 1, b.

Delete Article 4):

~~4) Anchor bolts, nuts, and washers.~~

Replace Article 6):

~~Iowa DOT Standard Road Plan RM-42, Type 1~~ Handholes and junction boxes.

2523.03, C, 3.

Replace the first sentence:

Furnish all apparatus and material for the pole mounted control ~~station~~ cabinet, as shown in the contract documents.

2523.03, C, 4.

Replace the first sentence:

If pad mounted transformers and control ~~stations~~ cabinets are specified, ensure they are furnished and installed as specified in the contract documents.

2523.03, D, 1.

Replace the Article:

Drill the holes for pole ~~footings~~ foundations and direct embedded poles.

2523.03, G, Footings.

Replace the title.

~~Footings~~ Foundations.

Replace Article 1:

1. Construct cast-in-place concrete ~~footings~~ foundations for all lighting units not located on structures or barriers. Form and pour the top portion of all ~~footings~~ foundations in form work to at least 6 inches (150 mm) below the finished ground level. Ensure the ~~footings~~ foundations conform in all respects to the details, including reinforcement and alignment to provide the correct overhang, as indicated in the contract documents.

Replace Article 3:

3. Construct an alternate ~~footing~~ foundation, as directed by the Engineer, when shale, sandstone, broken and shattered rock, solid rock, or other similar materials are encountered.

2523.03, I, Aluminum Transformer Bases.

Replace the Article:

~~Ensure the bottom flange of aluminum transformer bases are painted on the inside and outside surfaces with two coats of zinc-rich paint.~~ Install transformer base according to the manufacturer's recommendation and the contracts documents.

2523.03, J, 3.

Replace the first sentence:

~~Rake~~ Install single mastarm poles so the side of the shaft opposite the mastarm is plumb.

2523.03, J, 8.

Replace the Article:

After the erection has been inspected and approved, fill the space between the mounting flange and the concrete ~~footing~~ foundation with an approved non-shrink grout and finish as detailed.

2523.03, L, 1.

Replace the second sentence:

Construct circuits and control ~~stations~~ cabinets according to the contract documents.

2523.03, N, 2, b, Crossing Ducts.

Replace the Article:

1) Unless shown otherwise in the contract documents, use Schedule 80 PVC conduit for crossing ducts.

2) If crossings are to be placed without disturbing the existing surface, install by jacking or boring methods approved by the Engineer. Do not use jetting. No access to duct or jacking of duct from median will be allowed without Engineer's approval.

3) After cable is installed, seal duct terminal ends in handholes, transformer bases, pole foundations, or similar locations (as directed by the Engineer) against moisture. Use either approved sealing bushings or a non-hardening sealing compound.

2523.03, N, 2, c, Primary Service Ducts.

Replace the Article:

Apply installation requirements for lighting circuit ducts and crossing circuit ducts.

2523.03, P, Junction Boxes.

Replace the Article:

1. Furnish junction boxes of the type specified and install as indicated in the contract documents.

2. In locations subject to pedestrian traffic, install junction box covers with approved anti-skid pattern.

3. Where applicable, install fiber reinforced concrete junction box above a granular material complying with Gradation No. 3 or 5 in the Aggregate Gradation Table of Section 4109.

2523.03, R, Connectors.

Delete the second and third sentences:

~~Ensure connector assemblies are supplied with a disposable mounting pin, when required, and sufficient silicone compound to lubricate the metal parts and rubber housings. Ensure complete instructions are supplied with each connector.~~

2523.03, T, Control Station.

Replace the title and article:

Control ~~Station~~ Cabinet.

Furnish ~~the components specified and construct~~ and install the control ~~station~~ cabinets as indicated in the contract documents. Furnish and install meter sockets and meter loops unless an agreement for unmetered service has been secured at the time of construction.

1. General.

Meet the following requirements:

a. All load circuits within the control panel connected phase-to-phase, with neutral connections to grounds only.

b. All internal wiring for line and control circuits meet the requirements for single conductor cable. Thermoplastic cable may be used with Engineer's approval.

c. Line circuit conductor sizes comply with NEC requirements based on the total load current ratings of the branch circuit breakers supplied by the respective circuit segments, with a minimum size of No. 8 AWG. Minimum size for control circuit conductors is No. 12 AWG.

d. Minimum interrupting ratings for branch circuit breakers identical to line circuit breakers. Provide one branch breaker for each active circuit and specified spare.

e. Unless shown otherwise, load current ratings of

- 30 amperes for branch circuit breakers.
- 100 amperes for main circuit breakers.

f. Interrupting ratings for the contactor not less than the load current rating for the line circuit breaker.

g. Minimum working voltage rating of 240 volts for the control fuse. Use cartridge type fuse with dimensions 13/32 inch (10 mm) by 1 1/2 inch (38 mm). Current ratings as recommended by the manufacturer.

h. Double-break contact block test switch.

i. The control cabinet electrically bonded to the ground rod(s) with a copper wire or jumper equivalent to No. 6 AWG or larger.

2. Pole Mounted.

a. The utility company is to furnish aerial service drop and required meters according to their service agreement.

b. Provide control cabinets with all components within arranged to provide access for maintenance and space for four branch circuit breakers without disturbing other components or wiring.

c. Provide risers consisting of rigid conduit of the type shown on the plans. Use conduit with a nominal outside diameter of 2 inches (53 mm) or larger for top risers. Provide one 2 inch (53 mm) nominal outside diameter bottom riser for each active circuit and

specified spare unless shown otherwise on the plans.

3. Pad Mounted.

a. The Utility company is to furnish primary service cable, pad mounted transformer, and required meters according to their service agreement.

b. Apply all requirements for a pad mounted control cabinet with contractor. Provide cabinets with continuously welded seams and minimum interior dimensions of 2 feet 6 inches high by 3 feet wide by 2 feet deep (760 mm high by 600 mm wide by 200 mm wide).

c. Remotely mount photoelectric control as indicated on the plans. Connect photoelectric control socket to nearest accessible grounding connection, or where indicated on the detail plans, by means of a No. 12 AWG bare copper wire.

d. Use weatherproof threaded hubs or compression glands for duct connections into the cabinet.

e. Slope top surface of the concrete pad 1/4 inch per foot (20 mm per meter) in the direction of natural ground. Place concrete pads as directed by the Engineer.

2523.03, U, 4.

Replace the first sentence:

Measure ground resistance with the ground rod, or system of ground rods as described in Article 2523.03, ~~K~~ M, 2 disconnected from the circuit neutral wire.

2523.04, E, Under Deck Lighting.

Replace the Title.

~~**Under Deck**~~ **Underdeck Lighting.**

2523.05, A, 2.

Replace the Article:

Payment is full compensation for materials, equipment, excavation, and installation of the pole, luminaire, mastarm, ~~footing~~ foundation, base, ground rod, wiring within the pole, and connectors within the pole, according to the contract documents.

2523.05, D, 2.

Replace the Article:

Payment is full compensation for materials, equipment, excavation, meter socket, meter loop, control cabinet pole, and installation of control cabinet and all line and internal circuit~~ry~~ wiring.

2523.05, E, Under Deck Lighting.

Replace the Title and Article.

~~**Under Deck**~~ **Underdeck Lighting.**

1. Each.

2. ~~Under Deck~~ Underdeck Lighting luminaires shall be complete including lamps, ballast, and mounting device.

4185.02, A, 4.

Replace the first sentence:

The assembled lighting unit, consisting of the pole and all attachments including mastarms, luminaires, and breakaway base or slip base, as specified, complete and in place in the ~~footing~~ foundation anchor bolts, is required to withstand windloading equal to a wind of ~~80~~ 90 mph (~~130~~ 145 km/h) without fracture or apparent deformation of components.

4185.02, B, 6.

Replace the first bulleted item and add as the second bulleted item:

- Meet the requirements of ASTM A 563, ~~DH,~~

- Are grade DH,

4185.02, D, Breakaway (Transformer) Base.

Replace the article:

Furnish bases meeting the following requirements:

1. ~~Cast aluminum meeting requirements of ASTM B 108, 356-T6 or B 26, 356-T6 aluminum alloy.~~ Two piece weldments with internally welded inside corners/material 356 T6 complying with ASTM B108-87 aluminum alloy permanent mold castings.

2. ~~Compliance with AASHTO breakaway criteria.~~ Manufacturer tested to current AASHTO requirements for breakaway luminaire supports and FHWA approved.

3. ~~Capable of withstanding an applied moment at the top equal to the design moment of the applicable pole, and no less than 35,000 foot-pounds (47,500 N•m).~~ Capable of supporting the pole mounting height and mastarm length shown in the contract documents.

~~4. Yields to an applied momentum of 1,100 pound-seconds (4.9 kNs) when tested with an automobile or 400 pound-seconds (1.8 kN•s) when tested with a solid mass. The manufacturer should conduct the tests and certify the results to comply with requirements of current AASHTO requirements for breakaway luminaire supports.~~

~~5~~ **4.** Equipped with a ~~weatherproof~~ manufacturer furnished, non-aluminum (i.e. having no scrap value), access door with door opening area of no less than 100 square inches (0.065 m^2), unless shown otherwise.

4185.02, E, Steel Poles.

Replace the Title:

Steel Poles and Mastarms.

4185.02, F, Aluminum Poles.

Replace the Title:

Aluminum Poles and Mastarms.

4185.02, G, 1, a.

Replace the Article:

ANSI ~~05.1~~ (ATIS) O5.1, Group D.

4185.03, A, 6.

Replace the second sentence and Table 4185.03-1:

Unless specified otherwise, furnish only the light sources for roadway luminaires listed in Table 4185.03-1:

Table 4185.03-1: High Pressure Sodium Lamp

Wattage	ANSI C78.42-2009 Designation	Bulb
400 Watt	~~ANSI Code S51WA-400~~ S51/O-EJ	E18
250 Watt	~~ANSI Code S50VA-250~~ S50/O-EJ	E18
200 Watt	~~ANSI Code S66MN-200~~ S66/O-EJ	E18
150 Watt	~~ANSI Code S55SC-150~~ S55/O-NV	E23.5
100 Watt	~~ANSI Code S54SB-100~~ S54/O-NV	E23.5
70 Watt	~~ANSI Code S62ME-70~~ S62/O-NV	E23.5
Furnish high pressure sodium lamps for appropriate burning positions, as required by the luminaire.		

4185.03, B, 7.

Replace Table 4185.03-2:

Table 4185.03-2: High Pressure Sodium Lamp (Low Mounting Height Luminaires)

Wattage	ANSI C78.42-2009 Designation	Bulb
250 Watt	~~ANSI Code S50VA-250~~ S50/O-EJ	E18
150 Watt	~~ANSI Code S55SC-150~~ S55/O-NV	E23.5
100 Watt	~~ANSI Code S54SB-100~~ S54/O-NV	E23.5
70 Watt	~~ANSI Code S62ME-70~~ S62/O-NV	E23.5
Furnish high pressure sodium lamps for appropriate burning positions, as required by the luminaire.		

4185.04, B.

Replace the Article:

Unless designated otherwise, furnish rods of a minimum nominal 5/8 inch (16 mm) diameter, and a minimum length of 12 feet (3.6 m) for control ~~stations~~ cabinets and 8 feet (2.4 m) for installations at lighting units.

4185.07, A, 10.

Replace the Article:

Unless detailed otherwise in the contract documents, space provided for no less than one line (main) circuit breaker and four branch circuit breakers, one contactor, two surge ~~supressors~~ protection devices, and a test switch.

4185.07, C, 3.

Replace the Article:

Two surge ~~suppressors~~ protection devices.

4185.09, A, 1.

Replace the Article:

~~Constructed~~ Manufactured to ~~the dimensions~~ a nominal 17 inches wide by 30 inches long by 24 inches deep (430 mm wide by 760 mm long by 600 mm deep) or as shown in the contract documents.

4185.09, B, 1, d.

Replace the Article:

Apply applicable provisions of Article ~~370~~ 314 of the current NEC.

4185.10, B, 1.

Replace the Article:

Compliance with ~~ANSI~~ NEMA C80.1.

4185.10, C, Rigid Aluminum Conduit.

Replace the Article:

Furnish conduit meeting the requirements of ~~ANSI~~ NEMA C80.5.

4185.10, D, 4.

Replace the first sentence:

Compliance with applicable requirements of NEMA TC-3 and UL 514B and the manufacturer's recommendation for all materials and methods for attaching and making fittings.

4185.11, Connector Assemblies.

Replace the second sentence of the first paragraph and add as the third and fourth sentences:

Furnish connectors with complete instructions, assembly devices, a disposable mounting pin (when required), and silicone lubricant for all mating surfaces. Ensure connector assemblies

are waterproof, designed for both direct burial in earth and exposure to sunlight, and capable of repeated disconnections without damage to the watertight seals and terminals or reduction of conductivity below specifications. Furnish connectors recommended for the required cable sizes.

4185.12, A, 1, Insulation.

Replace the Article:

Furnish wire and cable meeting the following requirements:

1. Insulation.

- Rated for 600 volts.
- Thermosetting, cross linked polyethylene meeting the requirements of ICEA ~~S-66-524 (NEMA WC-7)~~ S-95-658 (ANSI/NEMA WC 70).
- Thickness meeting the requirements of Table No. 3-3~~1 Column "A"~~.
- ~~Unless specified otherwise in the contract documents, comply with applicable requirements of UL Standard No. 44.~~
- UL listed for use at conductor temperatures of 167°F (75°C) or higher in wet or dry locations.
- Bears required UL labeling repeated throughout their length.
- UL Listed Type USE-2 per UL Standard 854 and Type RHH or RHW-2 per UL Standard 44.

~~**2. Wire and Cable.**~~

- ~~Bear required UL labeling repeated throughout their length.~~
- ~~UL Listed Type USE-2 per UL Standard 854 and Type RHH or RHW-2 per UL Standard 44.~~

~~3~~2. Conductors.

- Annealed copper meeting the requirements of ASTM B 3.
- Sizes smaller than No. 8 AWG, may be solid or stranded.
- Sizes No. 8 AWG and larger are to be stranded and are to meet the requirements of ASTM B 8, Class B.

4185.12, D, 2.

Replace the Article:

Ensure the cable complies with requirements for ~~Type~~ Class B Control Cable as described in ANSI/ICEA ~~S-61-402 (NEMA WC-5)~~ S-73-532 (NEMA WC 57).

4185.12, E, Flexible Cord.

Replace the Article:

Use cord that is UL listed for Type SO and complies with applicable requirements of UL Standard No. 62~~ (Table 3.14)~~.

4185.13, Surge Supressor.

Replace the Title and Article:

Surge ~~Supressor~~ Protection Device (SPD)

Furnish ~~suppressors~~ SPDs meeting the following requirements:

A. Metal oxide varistor (MOV) type suppressor, suitable for 120/240 volt single-phase line voltage, with a ANSI/UL1449 ~~Category B3 voltage rating of 500 volts (line-neutral)~~ 3rd edition Type 1 with 20kA I-Nominal and voltage protection rating (VPR) of 700 volts (line-neutral).

B. Single-pulse (8/20 microsecond) maximum surge current rating of 50,000 amperes per mode.

C. NEMA ~~1 enclosure included~~ 4X rating that is suitable for mounting inside a lighting control

cabinet.

D. Each ~~line~~ MOV fused and a visual LED indication light installed to show power and suppression status.

Comments:

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and Highlight.)

2523.03, B, 1, a, 5, Required Shop Drawings.

Replace the article:

~~Iowa DOT Standard Road Plan RM-41, Underdeck Lighting (High Pressure Sodium Luminaire)~~ Underdeck luminaires with lamps.

2523.03, B, 1, a, 6, l, Required Shop Drawings.

Replace the article:

Surge ~~suppressor~~ protection device.

2523.03, B, 1, a, 7, Required Shop Drawings.

Replace the article:

~~Iowa DOT Standard Road Plan RM-40,~~ Cable Splices and Connectors.

2523.03, B, 9, Required Shop Drawings.

Renumber existing Article 9 as Article 10.

Add as Article 9:

9. Anchor bolts, nuts, and washers.

2523.03, B , 1, b, Shop Drawings not Required.

Delete Article 4:

~~Anchor bolts, nuts, and washers.~~

Renumber existing Articles 5 through 12 as 4 through 11.

Replace existing Article 6:

~~Iowa DOT Standard Road Plan RM-42, Type 1~~ Handholes and junction boxes.

2523.03, C, 1, Cooperation with Utility Companies.

Replace the first sentence:

The ~~u~~Utility ~~c~~Company ~~is to~~ shall provide secondary service to the project in the vicinity indicated.

2523.03, C, 3, Cooperation with Utility Companies.

Replace the first sentence:

Furnish all apparatus and material for the pole mounted control ~~station~~cabinet, as shown in the contract documents.

2523.03, C, 4, Cooperation with Utility Companies.

Replace the first sentence:

If pad mounted transformers and control ~~stations~~cabinets are specified, ensure they are furnished and installed as specified in the contract documents.

2523.03, D, 1, Excavation.

Replace the article:

Drill the holes for pole ~~footings~~foundations and direct embedded poles.

2523.03, G, Footing.

Replace "footing" with "foundation" in the title and article.

2523.03, I, Aluminum Transformer Bases.

Replace the article:

~~Ensure the bottom flange of aluminum transformer bases are painted on the inside and outside surfaces with two coats of zinc-rich paint.~~Install transformer base according to the manufacturer's recommendation and the contracts documents.

2523.03, J, 3, Poles and Mastarms.

Replace the first sentence:

~~Rake~~Install single mastarm poles so the side of the shaft opposite the mastarm is plumb.

2523.03, J, 8, Poles and Mastarms.

Replace the article:

After the erection has been inspected and approved, fill the space between the mounting flange and the concrete ~~footing~~foundation with an approved non-shrink grout and finish as detailed.

2523.03, L, 1, Circuits.

Replace the second sentence:

Construct circuits and control ~~stations~~cabinets according to the contract documents.

2523.03, N, 2, b, Crossing Ducts.

Replace the article:

1) Unless shown otherwise in the contract documents, use Schedule 80 PVC conduit for crossing ducts.

2) If crossings are to be placed without disturbing the existing surface, install by jacking or boring methods approved by the Engineer. Do not use jetting. No access to duct or jacking of duct from median will be allowed without the Engineer's approval.

3) After cable is installed, seal all duct terminal ends in handholes, transformer bases, pole foundations, or similar locations (as directed by the Engineer) against moisture. Use either approved sealing bushings or a non-hardening sealing compound.

2523.03, N, 2, c, Primary Service Ducts.

Replace the article:

Apply installation requirements for lighting circuit ducts and crossing circuit ducts.

2523.03, P, Junction Boxes.

Replace the article:

1. Furnish junction boxes of the type specified and install as indicated in the contract documents.

2. In locations subject to pedestrian traffic, install junction box covers with approved anti-skid pattern.

3. Where applicable, install fiber reinforced concrete junction box above a granular material complying with Gradation No. 3 or 5 in the Aggregate Gradation Table of Section 4109.

2523.03, R, Connectors.

Delete the second and third sentences:

~~Ensure connector assemblies are supplied with a disposable mounting pin, when required, and sufficient silicone compound to lubricate the metal parts and rubber housings. Ensure complete instructions are supplied with each connector.~~

2523.03, T, Control Station.

Replace the title and article:

Control ~~Station~~Cabinet.

Furnish ~~the components specified and construct~~ and install the control ~~station~~cabinets as indicated in the contract documents. Furnish and install meter sockets and meter loops unless an agreement for unmetered service has been secured at the time of construction.

1. General.

Meet the following requirements:

a. All load circuits within the control panel connected phase-to-phase, with neutral connections to grounds only.

b. All internal wiring for line and control circuits meet the requirements for single conductor cable. Thermoplastic cable may be used with the Engineer's approval.

c. Line circuit conductor sizes comply with NEC requirements based on the total load current ratings of the branch circuit breakers supplied by the respective circuit segments, with a minimum size of No. 8 AWG. Minimum size for control circuit conductors is No. 12 AWG.

d. Minimum interrupting ratings for branch circuit breakers identical to line circuit breakers. Provide one branch breaker for each active circuit and specified spare.

e. Unless shown otherwise, load current ratings of

- 30 amperes for branch circuit breakers.
- 100 amperes for main circuit breakers.

f. Interrupting ratings for the contactor not less than the load current rating for the line circuit breaker.

g. Minimum working voltage rating of 240 volts for the control fuse. Use cartridge type fuse with dimensions 13/32 inch (10 mm) by 1 1/2 inch (38 mm). Current ratings as recommended by the manufacturer.

h. Double-break contact block test switch.

i. The control cabinet electrically bonded to the ground rod(s) with a copper wire or jumper equivalent to No. 6 AWG or larger.

2. Pole Mounted.

a. The Utility Company shall furnish aerial service drop and required meters according to their service agreement.

b. Provide control cabinets with all components within arranged to provide access for maintenance and space for four branch circuit breakers without disturbing other components or wiring.

c. Provide risers consisting of rigid conduit of the type shown on the plans. Use conduit with a nominal outside diameter of 2 inches (53 mm) or larger for top risers. Provide one 2 inch (53 mm) nominal outside diameter bottom riser for each active circuit and specified spare unless shown otherwise on the plans.

3. Pad Mounted.

a. The Utility Company shall furnish primary service cable, pad mounted transformer, and required meters according to their service agreement.

b. Apply all requirements for a pad mounted control cabinet with contractor. Provide cabinets with continuously welded seams and minimum interior dimensions of 2 feet 6 inches high by 3 feet wide by 2 feet deep (760 mm high by 600 mm wide by 200 mm wide).

c. Remotely mount the photoelectric control as indicated on the plans. Connect the photoelectric control socket to the nearest accessible grounding connection, or where indicated on the detail plans, by means of a No. 12 AWG bare copper wire.

d. Use weatherproof threaded hubs or compression glands for all duct connections into the cabinet.

e. Slope the top surface of the concrete pad 1/4 inch per foot (20 mm per meter) in the direction of the natural ground. Place concrete pads as directed by the Engineer.

2523.03, U, 4, Final Acceptance.

Replace the first sentence:

Measure ground resistance with the ground rod, or system of ground rods as described in Article 2523.03, ~~K~~M, 2 disconnected from the circuit neutral wire.

2523.04, E, Under Deck Lighting.

Replace “Under Deck” with “Underdeck” in the title and article.

2523.05, A, 2, Lighting Poles.

Replace the article:

Payment is full compensation for materials, equipment, excavation, and installation of the pole, luminaire, mastarm, ~~footing~~foundation, base, ground rod, wiring within the pole, and connectors within the pole, according to the contract documents.

2523.05, D, 2, Control Cabinet.

Replace the article:

Payment is full compensation for materials, equipment, excavation, meter socket, meter loop, control cabinet pole, and installation of control cabinet and all line and internal circuit~~ry~~ wiring.

2523.05, E, Under Deck Lighting.

Replace “Under Deck” with “Underdeck” in the title and article.

4185.02, A, 4, Poles and Supports.

Replace the first sentence:

The assembled lighting unit, consisting of the pole and all attachments including mastarms, luminaires, and breakaway base or slip base, as specified, complete and in place in the ~~footing~~foundation anchor bolts, is required to withstand windloading equal to a wind of ~~80~~90 mph (~~130~~145 km/h) without fracture or apparent deformation of components.

4185.02, B, 6, Anchor Bolt and Slip-Base Plate Fasteners for Lighting Poles.

Replace the first bulleted item an add as the second bulleted item:

- Meet the requirements of ASTM A 563, ~~DH~~
- Are grade DH,

4185.02, D, Breakaway (Transformer) Base.

Replace the article:

Furnish bases meeting the following requirements:

1. Two piece weldments with internally welded inside corners/material 356 T6 complying with ASTM B108-87 aluminum alloy permanent mold castings~~Cast aluminum meeting requirements of ASTM B 108, 356-T6 or B 26, 356-T6 aluminum alloy~~.

2. Manufacturer tested to current AASHTO requirements for breakaway luminaire supports and Federal Highway Administration (FHWA) approved~~Compliance with AASHTO breakaway criteria~~.

3. Capable of supporting the pole mounting height and mastarm length shown in the contract documents~~Capable of withstanding an applied moment at the top equal to the design moment of the applicable pole, and no less than 35,000 foot-pounds (47,500 N•m)~~.

~~**4.** Yields to an applied momentum of 1,100 pound-seconds (4.9 kNs) when tested with an automobile or 400 pound-seconds (1.8 kN•s) when tested with a solid mass. The manufacturer should conduct the tests and certify the results to comply with requirements of current AASHTO requirements for breakaway luminaire supports.~~

~~**5**~~**4.** Equipped with a ~~weatherproof~~ manufacturer furnished, other than aluminum (i.e. having no scrap value), access door with door opening area of no less than 100 square inches (0.065 m^2), unless shown otherwise.

4185.02, E, Steel Poles.

Replace the title:

Steel Poles and Mastarms.

4185.02, F, Aluminum Poles.

Replace the title:

Aluminum Poles and Mastarms.

4185.02, G, 1, a, Wood Poles.

Replace the article:

~~ANSI 05.1~~ ANSI (ATIS) O5.1, Group D.

4185.03, A, 6, Roadway Luminaire.

Replace the second sentence and Table 4185.03-1:

Unless specified otherwise, furnish only the light sources for roadway luminaires listed in Table 4185.03-1:

~~Table 4185.03-1: High Pressure Sodium Lamp~~	
~~400 Watt~~	~~ANSI Code S51WA-400~~
~~250 Watt~~	~~ANSI Code S50VA-250~~
~~200 Watt~~	~~ANSI Code S66MN-200~~
~~150 Watt~~	~~ANSI Code S55SC-150~~
~~100 Watt~~	~~ANSI Code S54SB-100~~
~~70 Watt~~	~~ANSI Code S62ME-70~~
~~Furnish high pressure sodium lamps for appropriate burning positions, as required by the luminaire.~~	

Table 4185.03-1: High Pressure Sodium Lamp		
Wattage	ANSI C78.42-2009 Designation	Bulb
400 Watt	S51/O-EJ	E18
250 Watt	S50/O-EJ	E18
200 Watt	S66/O-EJ	E18
150 Watt	S55/O-NV	E23.5
100 Watt	S54/O-NV	E23.5
70 Watt	S62/O-NV	E23.5
Furnish high pressure sodium lamps for appropriate burning positions, as required by the luminaire.		

4185.03, B, 7, Low Mounting Height Luminaires.

Replace Table 4185.03-2:

~~Table 4185.03-2: High Pressure Sodium Lamp~~	
~~250 Watt~~	~~ANSI Code S50VA-250~~
~~150 Watt~~	~~ANSI Code S55SC-150~~
~~100 Watt~~	~~ANSI Code S54SB-100~~
~~70 Watt~~	~~ANSI Code S62ME-70~~
~~Furnish high pressure sodium lamps for appropriate burning positions, as~~	

~~required by the luminaire.~~

Table 4185.03-2: High Pressure Sodium Lamp (Low Mounting Height Luminaires)		
Wattage	ANSI C78.42-2009 Designation	Bulb
250 Watt	S50/O-EJ	E18
150 Watt	S55/O-NV	E23.5
100 Watt	S54/O-NV	E23.5
70 Watt	S62/O-NV	E23.5
Furnish high pressure sodium lamps for appropriate burning positions, as required by the luminaire.		

4185.04, B, Ground Rods.

Replace the article:

Unless designated otherwise, furnish rods of a minimum nominal 5/8 inch (16 mm) diameter, and a minimum length of 12 feet (3.6 m) for control ~~stations~~cabinets and 8 feet (2.4 m) for installations at lighting units.

4185.07, A, 10, Control Cabinets.

Replace the article:

Unless detailed otherwise in the contract documents, space provided for no less than one line (main) circuit breaker and four branch circuit breakers, one contactor, two surge ~~supressors~~ protection devices, and a test switch.

4185.07, C, 3, Control Cabinets.

Replace the article:

Two surge ~~suppressors~~ protection devices.

4185.09, A, 1, Preformed Junction Boxes.

Replace the article:

~~Constructed~~Manufactured to ~~the dimensions~~ a nominal 17 inches wide by 30 inches long by 24 inches deep (430 mm wide by 760 mm long by 600 mm deep) or as shown in the contract documents.

4185.09, B, 1, d, Cast Iron Junction Boxes.

Replace the article:

Apply applicable provisions of Article ~~370~~314 of the current NEC.

4185.10, B, 1, Rigid Steel Conduit.

Replace the article:

Compliance with ~~ANSI~~NEMA C80.1.

4185.10, C, Rigid Aluminum Conduit.

Replace the article:

Furnish conduit meeting the requirements of ~~ANSI~~NEMA C80.5.

4185.10, D, 4, Plastic Conduit and Fittings.

Replace the first sentence:

Compliance with applicable requirements of NEMA TC-3 and UL 514B and the manufacturer's recommendation for all materials and methods for attaching and making fittings.

4185.11, Connector Assemblies.

Replace the second sentence of the first paragraph and add as the third and fourth sentences:

Furnish connectors with complete instructions, assembly devices, a disposable mounting pin (when required), and silicone lubricant for all mating surfaces. Ensure connector assemblies are: 1) waterproof; 2) designed for both direct burial in the earth and exposure to sunlight; and 3) are capable of repeated disconnections without damage to the watertight seals and terminals or reduction of conductivity below specifications. Furnish connectors recommended for the required cable sizes.

4185.12, A, 1, Single Conductor Wire and Cable.

Replace the article:

Furnish wire and cable meeting the following requirements:

1. Insulation.

- Rated for 600 volts.
- Thermosetting, cross linked polyethylene meeting the requirements of ~~ICEA S-66-524 (NEMA WC-7)~~ ICEA S-95-658 (ANSI/NEMA WC 70).
- Thickness meeting the requirements of Table No. 3-~~31 Column "A"~~.
- ~~Unless specified otherwise in the contract documents, comply with applicable requirements of UL Standard No. 44.~~
- UL listed for use at conductor temperatures of 167°F (75°C) or higher in wet or dry locations.
- ~~Bears required UL labeling repeated throughout their length.~~
- ~~UL Listed Type USE-2 per UL Standard 854 and Type RHH or RHW-2 per UL Standard 44.~~

~~**2. Wire and Cable.**~~

- ~~Bear required UL labeling repeated throughout their length.~~
- ~~UL Listed Type USE-2 per UL Standard 854 and Type RHH or RHW-2 per UL Standard 44.~~

~~3~~2. Conductors.

- Annealed copper meeting the requirements of ASTM B 3.
- Sizes smaller than No. 8 AWG, may be solid or stranded.
- Sizes No. 8 AWG and larger are to be stranded and are to meet the requirements of ASTM B 8, Class B.

4185.12, D, 2, Control Cable.

Replace the article:

Ensure the cable complies with requirements for ~~Type~~Class B Control Cable as described in ~~ICEA S-61-402 (NEMA WC-5)~~ ANSI/ICEA S-73-532 (NEMA WC 57).

4185.12, E, Flexible Cord.

Replace the article:

Use cord that is UL listed for Type SO and complies with applicable requirements of UL Standard No. 62~~ (Table 3.14)~~.

4185.13, Surge Supressor.

Replace the title and article:

Surge ~~Supressor~~Protection Device (SPD)

Furnish ~~suppressors~~ SPDs meeting the following requirements:

A. Metal oxide varistor (MOV) type suppressor, suitable for 120/240 volt single-phase line voltage, with a ANSI/UL1449 ~~Category B3 voltage rating of 500 volts (line-neutral)~~ 3rd edition Type 1 with 20kA I-Nominal and voltage protection rating (VPR) of 700 volts (line-neutral).

B. Single-pulse (8/20 microsecond) maximum surge current rating of 50,000 amperes per mode.

C. NEMA ~~1 enclosure included~~ 4X rating that is suitable for mounting inside a lighting control cabinet.

D. Each ~~line~~MOV fused and a visual LED indication light installed to show power and suppression status.

Reason for Revision: These sections were reviewed by lighting consultant to bring the sections up to date with current practice.

County or City Input Needed (X one)			**Yes**	**No** X	
Comments:					
Industry Input Needed (X one)			**Yes** X	**No**	
Industry Notified:	**Yes** X	**No**	**Industry Concurrence:**	**Yes**	**No**

Comments: Industry had comments related to updating code references and changes related to introduction of new equipment since this section was last revised.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder	**Office:** Construction and Materials	**Item 6**
Submittal Date: 2013.07.05	**Proposed Effective Date:** April 2014	
Article No.: 4118.03 **Title:** Quality (Pipe Bedding Material)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 4/15/2014

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:
4118.03, Quality.

Replace Table 4118.03-1, Coarse Aggregate Quality (Virgin Material):

Table 4118.03-1: Coarse Aggregate Quality (Virgin Material)

Coarse Aggregate Quality	Maximum Percent Allowed	Test Method
Abrasion	50	AASHTO T 96
C Freeze	~~15~~ 20	Iowa 211, Method C

Comments:

Member's Requested Change: (Do not use **'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and Highlight.**)
4118.03 QUALITY.
The requirements of Table 4118.03-1 apply to individual virgin aggregates:

Table 4118.03-1: Coarse Aggregate Quality (Virgin Material)

Coarse Aggregate Quality	Maximum Percent Allowed	Test Method
Abrasion	50	AASHTO T 96
C - Freeze	~~15~~ 20	Iowa 211, Method C

For crushed PCC, meet requirements of Materials I.M. 210.

Reason for Revision: Requested by Iowa Limestone Producers. They argued that in most pipe bedding applications Freeze-Thaw is not an issue. The exception to this may be in "day-lighted" storm sewers.

County or City Input Needed (X one)	**Yes**	**No** X
Comments:		

Industry Input Needed (X one)			**Yes** X	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes** X	**No**

Comments: This change was approved at a previous DME meeting. This spec is referenced in Article 2552 which is mostly for municipal applications.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder	**Office:** Construction and Materials	**Item 7**
Submittal Date: 2013.06.05	**Proposed Effective Date:**	
Article No.: **Title:**	**Other:** SS-12003,Polymer Modified Microsurfacing	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 11/19/2013

Specification Committee Approved Text: See attached Developmental Specifications for Polymer Modified Microsurfacing.

Comments: The Specifications Section asked if this SS should be incorporated into the Standard Specifications. The Office of Construction and Materials had no issues with this and indicated that the specification will be used more frequently in the future. There may be some changes to the rates indicated in the Design Manual, as new aggregates are used, but they should not affect the specification. The SS will be incorporated into the April GS.

The Office of Construction and Materials requested that Table 4124.03-1 of the Standard Specifications be included in the SS for easier reference. The Specifications Section does not feel it is appropriate to duplicate the table, especially the specification will be incorporated into the Standard Specifications.

There will be three new bid items associated with this specification. Separate bid items will be created for Aggregate for Microsurfacing for the three friction types. There could be a large difference between the aggregate prices for the locally sourced versus imported materials.

The District 6 Office asked about the units shown for Wet Track Abrasion Loss in Article 12XXX.02, F, 3. English units are 50 grams per square foot, which is a mixed unit. The Office of Construction and Materials indicated that these are the units specified in the International Slurry Surfacing Association guidelines. The Office of Construction and Materials will verify that the units shown are consistent with the guidelines.

Specification Section Recommended Text: See attached Draft Developmental Specifications for Polymer Modified Microsurfacing.

Comments:

SUPPLEMENTAL SPECIFICATIONS
FOR
POLYMER-MODIFIED MICROSURFACING

B. Aggregate.

1. Use mineral aggregate composed of a combination of crushed stone and mineral filler meeting the following requirements based on the friction classification specified in the contract documents: Aggregate source frictional classifications can be found in Materials I.M. T-203.

a. Friction Classification L-2
Use Friction Type 2 crushed stone complying with the following:

- Article 4124, Table 4124.03-1 with the following exceptions
  - Maximum abrasion loss of 30%
  - Sand equivalence of not less than 60
- Objection materials limits in Table 13XXX.02-01

b. Friction Classification L-4

Use Friction Type 4 or better crushed stone complying with the following:

- Article 4124, Table 4124.03-1
- Objection materials limits in Table 13XXX.02-01

c. Friction Classification L-5

Use Friction Type 5 or better crushed stone complying with the following:

- Article4124, Table 4124.03-1
- Objection materials limits in Table 13XXX.02-01

Table 13XXX.02-01: Maximum Permissible Amounts of Objectionable Material

Objectionable Materials	Maximum Percent Allowed	Test Method
Unsound chert particles retained on No. 4 (4.75 mm) sieve	0.5	Materials I.M. 372
Total of all unsound chert, shale, coal, and iron combined	1.0	Materials I.M. 372
Clay Lumps/Friable Particles	0.5	Materials I.M. 368
Organic Materials, except coal	0.1	Office of Materials Test Method No. Iowa 215

Reason for Revision: To allow the use of local Iowa DOT approved aggregates.

County or City Input Needed (X one)	**Yes**	**No** X
Comments:		

Industry Input Needed (X one)			**Yes** X	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes** X	**No**

Comments:. Previous microsurfacing projects using limestone in Pocahontas County and in West Des Moines have been reviewed. All projects have exceeded the projected life expectancy. Recent friction testing gave results in the high 40's and 50's. Permitting the use of local limestone and dolomite should be a tremendous cost-saving.

DRAFT SS-12XXX
(Replaces SS-12003)

Iowa Department of Transportation

SUPPLEMENTAL SPECIFICATIONS
FOR
POLYMER-MODIFIED MICROSURFACING

Effective Date
September 17, 2013

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SUPPLEMENTAL SPECIFICATIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

12XXX.01 DESCRIPTION.
Applying a properly proportioned, mixed, and uniformly spread mixture of polymer-modified emulsified asphalt, mineral aggregate, mineral filler, water, and necessary additives on existing roadway surfaces.

12XXX.02 MATERIALS.

A. Polymer-Modified Emulsified Asphalt.

1. Use a blend of emulsified quick-set polymer-modified CSS-1H asphalt and latex-based polymer.

2. Use a polymer material milled or blended into asphalt or blended into emulsifier solution prior to emulsification process.

3. The laboratory performing the mix design is to determine the amount and type of latex-based polymer modifier based on the percent of asphalt by weight (mass) of asphalt, with 3% polymer solids as the minimum. Provide the Engineer, at the time of delivery, a certification from the emulsion manufacturer that 3% minimum polymers have been added to the emulsion.

4. Use CSS-1H polymer-modified emulsified asphalt complying with the requirements of AASHTO M 208, with the following modifications and additions:
a. The storage stability and cement mixing test is not required for this emulsion.

TEST	QUALITY	REQUIREMENTS
AASHTO T 59	Residue after distillation	62% minimum

b. Modify the standard distillation procedure as follows:

Slowly bring the temperature on the lower thermometer to 350ºF +/- 10ºF (177ºC +/- 5ºC) and maintain at this level for 20 minutes. The total distillation shall be completed in 60 minutes +/- 5 minutes from the first application of heat.

TEST ON RESIDUE

AASHTO T 53	Ring and Ball Softening Point	135ºF (57ºC) minimum

B. Aggregate.

1. Use mineral aggregate composed of a combination of crushed stone and mineral filler meeting the following requirements~~:~~ based on the friction classification specified in the contract documents. Aggregate source frictional classifications can be found in Materials I.M. T-203.

a. Friction Classification L-2.

Use Friction Type 2 crushed stone complying with the following:

- Table 4124.03-1 of the Standard Specifications with the following exceptions:
  - Maximum abrasion loss of 30%, and
  - Sand equivalence of not less than 60.
- Objectionable materials limits in Table 12XXX.02-01.

b. Friction Classification L-4.

Use Friction Type 4 or better crushed stone complying with the following:

- Table 4124.03-1 of the Standard Specifications, and
- Objectionable materials limits in Table 12XXX.02-01.

c. Friction Classification L-5.

Use Friction Type 5 or better crushed stone complying with the following:

- Table 4124.03-1 of the Standard Specifications, and
- Objectionable materials limits in Table 12XXX.02-01.

Table 12XXX.02-01: Maximum Permissible Amounts of Objectionable Material

Objectionable Materials	Maximum Percent Allowed	Test Method
Unsound chert particles retained on No. 4 (4.75 mm) sieve	0.5	Materials I.M. 372
Total of all unsound chert, shale, coal, and iron combined	1.0	Materials I.M. 372
Clay Lumps/Friable Particles	0.5	Materials I.M. 368
Organic Materials, except coal	0.1	Office of Materials Test Method No. Iowa 215

:

~~**1.** Crushed stone from sources that will produce aggregate complying with the following:~~

- ~~An abrasion loss no more than 30% and a freezing-and-thaw loss of no more than 10 (Iowa Materials Laboratory Test Method 211, Method A) when tested using aggregate crushed to 3/4 inch (19 mm) maximum size.~~
- ~~Free of deleterious materials.~~
- ~~Type 2 or Type 3 friction classification according to Materials I.M. T-203.~~
- ~~Sand equivalent of not less than 60, as determined according to AASHTO T 176.~~

2. The job mix (target) gradation within the gradation band specified below. The percent passing shall not go from the high end to the low end of the range for any two consecutive screens.

Sieve Size	Percent Passing
3/8" (9.5 mm)	100
#4 (4.75 mm)	90-100
#8 (2.36 mm)	65-90
#16 (1.18 mm)	45-70
#30 (600 µm)	30-50

#50 (300 µm)	18-30
#100 (150 µm)	10-21
#200 (75 µm)	5-15

C. Mineral Filler.
Free of lumps and meeting the requirements for Type I Portland Cement according to Section 4101 of the Standard Specifications.

D. Water.
Comply with Section 4102 of the Standard Specifications.

E. Additives.
Additives may be added to the emulsion mix or any of the component materials to provide control of the quick-set properties and increase adhesion. Additives must be included as part of the mix design and be certified as to their compatibility with other components of the mix.

F. Composition and Quality of Mixture.

1. An approved mix design will be required prior to beginning placement of the microsurfacing mixture. Designing and proportion the mixture. Comply with the following:
- Mix design prepared by a laboratory having three or more years experience in designing microsurfacing.
- Microsurfacing mixture designed according to the International Slurry Surfacing Association (ISSA) guidelines.
- Submit the proposed mix design to the Materials Bituminous Engineer in the Central Laboratory for approval with a copy to the District Materials Engineer. The Central Laboratory will review the mix design within 14 calendar days.
- Along with the proposed mix design include all test results, proportions of all ingredients of the mixture, and gradation of the aggregate proposed for use.

2. Ensure the mix design designates the proportions to be used within the following limits:
- Mineral aggregate for microsurfacing: 10-20 pounds per square yard (dry weight) (5-11 kg/m^2 (dry mass)).
- Polymer-Modified Emulsified Asphalt, P.M. CSS-1H: residual asphalt 6% to 12% by dry weight (mass) of aggregate.
- Mineral Filler: 0.5% to 3.0% by dry weight (mass) of aggregate.
- Water: as needed to provide proper consistency.

3. For the microsurfacing mixture, meet the following requirements:

TEST	**DESCRIPTION**	**REQUIREMENTS**
ISSA TB-139	WET COHESION	
	@ 30 minutes (set)	10 lb-in (12 kg-cm) minimum
	@ 60 minutes (traffic)	17 lb-in (20 kg-cm) minimum
ISSA TB-109	Excess Asphalt by LWT	50 g/ft² (538 g/m²) maximum
ISSA TB-114	Wet Stripping	Pass (90% minimum)
ISSA TB-100	Wet Track Abrasion Loss	
	One hour soak	50 g/ft² (538 g/m²) maximum
	Six Day Soak	75 g/ft² (807 g/m²) maximum

ISSA TB-147A	Lateral Displacement	5% maximum
	Specific Gravity after 1000 cycles of 125 lbs. (57 kg)	2.10 maximum
ISSA TB-144	Classification	(AAA, BAA)
	Compatibility	11 grade points minimum
ISSA TB-113	Mix Time @ 77ºF (25ºC)	Controllable to 120 sec. minimum

12XXX.03 CONSTRUCTION.

A. Equipment.

1. Use a spreading machine designed and manufactured to perform microsurfacing work, including prewetting the surface. To mix the material, use an automatic sequenced, self-propelled microsurfacing mixing machine, able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, control setting additive and water to a revolving multi-blade double shafted mixer, and discharge the mixed product on a continuous flow basis. Use a mixing machine with sufficient storage capacity for aggregate, emulsified asphalt, mineral filler, control additive and water to ensure a constant flow of a homogeneous slurry mixture.

2. Use equipment providing individual volume or weight controls for proportioning each material to be added to the mix. Calibrate and properly mark each material control device.

3. Equip the aggregate feed to the mixer with a revolution counter or similar device so that the amount of aggregate used may be determined at any time.

4. Use equipment with a positive displacement type emulsion pump equipped with a revolution counter or similar device so that the amount of emulsion used may be determined at any time.

5. Use a mixing machine equipped with a pressurized water system and a nozzle-type spray bar to provide water spray to the roadway surface immediately ahead of and outside the spreader box.

6. Use a mixing machine equipped with fines feeder that delivers a uniform, positive, accurately-metered, predetermined amount of mineral filler at the same time and location that the aggregate is fed.

7. Calibrate the mixing unit in the presence of the Engineer prior to the start of construction.

8. Provide nurse trucks to ensure that legal axle loads are maintained and a steady rate of progress in the laying of the microsurfacing is made.

B. Weather Limitations.

1. Spread microsurfacing material only when the temperature on a shaded portion of the existing surface is 50ºF (10°C) and rising and when the weather is not foggy or rainy.

2. Do not place Microsurfacing material after October 1 without the Engineer’s written permission.

C. Materials Handling.

Furnish samples of individual materials and the microsurfacing mixture as specified in the contract documents.

1. Stockpiling of Aggregate.

Screen and weigh the mineral aggregate at the stockpile prior to job site delivery. Do not allow stockpiles to become contaminated with oversized rock, clay, and silt. Excess moisture which would interfere with the amount of asphalt required in producing the desired homogeneous mixture will not be permitted. Keep the stockpile in areas that drain readily. Segregation of the aggregate will not be permitted.

2. Storage of Emulsion.

Weigh the polymer-modified emulsified asphalt on approved scales. As an option, polymer-modified emulsified asphalt may be measured by volume. Provide suitable storage facilities for the polymer-modified emulsified asphalt that meet the following requirements:

- Equipped to prevent water from entering the emulsion.
- Adequately heated to prevent freezing of the polymer-modified emulsified asphalt.

D. Preparation of Surface.

Immediately before placing microsurfacing, thoroughly clean the area to be microsurfaced of all vegetation, loose aggregate, soil tracked onto the roadway, and other objectionable material.

E. Test Strip.

Prior to commencing paving operations:

- Construct a minimum 300 foot (100 m) test section (a portion of which is at least 0.75 inch (19 mm) thick) to determine surface characteristics and set time.
- Obtain the Engineer's approval for the test section.

F. Spreading.

1. General.

a. When required by local conditions, prewet the surface at a rate to dampen the entire surface without any free-flowing water ahead of the spreader box. Adjust the rate of application of the fog spray during the day to suit temperatures, surface texture, humidity, and dryness of the pavement.

b. Use a mechanical type spreader box (normally 10 to 13 feet (3 to 4 m) wide, equipped with rotating paddles or spiral augers to agitate and spread the material uniformly throughout the box) to spread the microsurfacing mixture homogeneously and uniformly. Meet the following requirements:

- Flexible seals are in contact with the road to prevent loss of the mixture from the box.
- A secondary strike off is provided to improve the surface texture.
- The spreader is maintained to prevent the loss of the microsurfacing mixture during the surfacing of superelevated curves.
- The mixture is spread to fill all crack and minor surface irregularities and leave a neat appearing uniform non-skid application of the aggregate and asphalt on the surface.

c. Remove all excess material that overruns in gutters, or squeegee the material back onto the surface. Immediately remove all excess material from ends of each day's run.

2. Application Rate.

Place surface treatment at a minimum application rate of 20 pounds per square yard (11 kg/m^2).

3. Finished Surface.

The Engineer will make inspections of the finished surface at any time. On any 30 square yards (25 m^2) of surface area inspected, comply with the following:

- No more than four tear marks greater than 0.5 inch (13 mm) wide and/or 4 inches (100 mm) long.
- No tear marks greater than 1 inch (25 mm) wide and 3 inches (75 mm) long.
- No transverse ripples or longitudinal streaks of 0.25 inch (6 mm) or more in depth.

4. Joints.
Construct longitudinal and transverse joints without any buildups, uncovered areas or unsightly appearance, complying with the following requirements:
- Longitudinal joints on lane lines are placed with less than 2 inches (50 mm) overlap on adjacent passes and no more than 0.25 inch (6 mm) difference in elevation between the adjacent passes.
- Transverse joints are constructed with no more than 0.125 inch (3 mm) difference in elevation across the joint.

5. Edges.
Place edges in the following manner:
- Neatly and uniformly along the roadway lane, shoulder, and curb lines.
- Flush with curbs.
- No more than +/- 2 inches (50 mm) horizontal variance in any 100 foot (30 m) segment along roadway lane and shoulder (at locations where feathered microsurfacing is identified in the contract documents, +/- 2 inches (50 mm) edge variance is not required).

G. Opening to Traffic.

1. Allow microsurfacing to cure sufficiently so that it will not deform or be picked up by vehicle tires. Provide signs, barricades, and flaggers necessary to control traffic around the areas under construction. Repair damage to the microsurfacing due to premature opening to traffic at no additional cost to the Contracting Authority.

2. Place microsurfacing treatment to sustain traffic within 1 hour after placement. Schedule microsurfacing placement to ensure traffic lanes are opened to traffic 30 minutes before sundown of the same working day. When traffic is maintained, keep the entire roadbed is free of construction equipment during non-working hours.

12XXX.04 METHOD OF MEASUREMENT.
Measurement will be as follows:

A. Aggregate for Microsurfacing.
Weight (mass) of the individual loads in tons (megagrams) of aggregate used in accepted portions of work. No deductions will be made for moisture naturally occurring in the aggregate. The quantity of mineral filler will be included with the aggregate quantity.

B. Preparation of Surface for Microsurfacing.
Plan quantity for the length of pavement prepared according to the contract documents.

C. Emulsified Asphalt for Microsurfacing.
Volume of emulsified asphalt including polymer latex modifier used in accepted portions of work. No deductions will be made for water in approved emulsion. The volume will be corrected for temperature to 60ºF (16ºC).

Materials wasted after being used for calibration purposes will be included in quantities measured for payment, not to exceed 5 tons (5 Mg) of aggregate and 100 gallons (375 L) of emulsified asphalt. The quantities of materials used for construction of a test strip will be included in the quantities of the respective bid items.

12XXX.05 BASIS OF PAYMENT.
Payment will be the contract unit price as follows:

A. Aggregate for Microsurfacing.
Per ton (megagram) for the number of tons (megagrams) of aggregate used. Payment is full compensation for furnishing all labor, equipment, and materials (except emulsified asphalt) to complete the work and construction of the test strip.

B. Preparation of Surface for Microsurfacing.
Per mile (kilometer) for the length of pavement shown in the contract documents prepared for microsurfacing according to the contract documents.

C. Emulsified Asphalt for Microsurfacing.
Per gallon (liter) for the number of gallons (liters) of emulsified asphalt used. Payment is full compensation for furnishing the emulsified asphalt.

Iowa Department of Transportation
Office of Design

XX-X

Microsurfacing

Design Manual
Chapter 7
Pavement

Originally Issued: X-X-13
Revised:

Microsurfacing is a surface treatment used to preserve existing surfaces and/or correct surface friction deficiencies. The material consists of polymer-modified emulsion, filler, additives, and fine aggregate and is applied in a thin layer (3/8 inch or less). More than one lift may be placed when filling ruts and surface irregularities. The road may be opened to traffic (normally) within an hour of placement. Typical life spans range from 5 to 10 years. Use the following guidelines for designing Microsurfacing projects:

1. Aggregate for Microsurfacing (tons)

- The normal design rate of application shall be 18 lb/sy. When more than one lift is placed, use 20 lb/sy for the lower lift.
- The following guidance may be used to select a friction classification

Route	Total ADT		Total ADTT	Friction Classification Level
Interstate				L-2
Primary	≥ 2,500	or	≥ 300	L-2
	< 2,500	and	< 300	L-4[1] or better
Secondary and Municipal Roads				L-5[2] or better

1) If microsurfacing is intended to address a friction problem, use L-2.
2) If microsurfacing is intended to address a friction problem, use L-2.

2. Emulsified Asphalt for Microsurfacing (gallons)

- The normal design rate of application shall be 12 % of the total aggregate.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Mark Bortle	**Office:** Construction and Materials	**Item 8**
Submittal Date: 2013.05.16	**Proposed Effective Date:** September 17, 2013	
Article No.: **Title:**	**Other:** DS-12017, Temporary Lane Separator System	

Specification Committee Action: Approved with revisions.

Deferred:	**Not Approved:**	**Approved Date:** 8/8/2013	**Effective Date:** 9/17/2013

Specification Committee Approved Text: See attached Developmental Specifications for Temporary Lane Separator System.

Comments: The District 4 Materials Office requested that we add Materials I.M. references for the reflective sheeting and non shrink grout.

The Office of Contracts asked if non shrink grout was the only acceptable product for filling holes in the pavement or bridge deck. The District 6 Office indicated that they had seen epoxy used. Although epoxy would be more convenient for the contractor, cleaning of the holes would be required to ensure a good bond with the PCC or HMA. Cleaning of the holes would require a compressor to be available and be difficult to inspect. The District 6 Office asked if non shrink grout was appropriate for HMA pavements. The District 3 Construction Office indicated that non shrink grout should work fine for either pavement type and not require two products for projects that may have both pavement types.

Specification Section Recommended Text: See attached Draft Developmental Specifications for Temporary Lane Separator System.

Comments:

Member's Requested Change: **(Do not use 'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and Highlight.)**

See attachment

Reason for Revision: To update to include allowance for MASH approved systems, update sheeting type to current requirements, include maximum spacing of gap between individual units, to increase height of posts to be consistent with the MUTCD, and to require non shrink grout to be used to fill anchor holes.

County or City Input Needed (X one)	**Yes**	**No** X
Comments:		

Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

DS-12XXX
(Replaces DS-12017)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
TEMPORARY LANE SEPARATOR SYSTEM

Effective Date
September 17, 2013

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

12XXX.01DESCRIPTION.
A temporary lane separator system consists of a combination of longitudinal curb units and upright flexible, retroreflective posts. Use one of the approved systems listed in Materials I.M. 488.05. Other temporary lane separator systems may be approved by contacting the Iowa DOT's Manufactured Products Engineer at 515.239.1259.

12XXX.02MATERIALS.
Furnish a system meeting the following requirements:

A. General.
- The modular units interface with each other to form a continuous longitudinal channelizing system.
- The temporary lane separator system is designed to allow a radius or curve as required by roadway geometry.
- The complete system is NCHRP 350 or Manual for Assessing Safety Hardware (MASH) compliant. A copy of the FHWA approval letter may be required by the Engineer.

B. Curb Unit.
- Modular design that is fastened to or placed on the underlying pavement or bridge deck according to the manufacturer's recommendations.
- Mountable design to allow for emergency vehicle crossovers.
- Minimum of one drainage scupper per unit or other drainage system to allow for cross drainage under or around the curb module with a maximum of 1 inch (25 mm) separation between individual curb units.
- Minimum length of 36 inches (0.9 m), maximum height of 4 inches (100 mm), and maximum width of 12 inches (300 mm).
- Yellow if used in a work zone installation or a permanent installation adjacent to yellow pavement markings, and white if used in a permanent installation adjacent to white pavement markings.

C. Upright Post.
- At least one upright post (manufactured from flexible plastic) for each modular curb unit.
- Posts uniformly spaced at no greater than 42 inches (1.1 m) along the channelizing system.

- Posts orange in color if used in a work zone installation, yellow if used in a permanent installation adjacent to yellow pavement markings, and white if used in a permanent location adjacent to white pavement markings.
- Posts a minimum of ~~26 inches (650 mm)~~ 28 inches (710 mm) in height measured from the pavement or bridge surface, and a minimum of 2 inches (50 mm) in width facing traffic.
- Two 6 inch (150 mm) bands of Type ~~III~~IV retroreflective sheeting meeting the requirements of Materials I.M. 486.03 placed near the top of each post (top band located no more than 2 inches (50 mm) from the top of the post), with a maximum 4 inch (100 mm) space between the bands.
- White retroreflective sheeting if used in a work zone or permanent installation adjacent to a white pavement marking, and yellow retroreflective sheeting if used in a permanent installation adjacent to yellow pavement markings.
- Posts easily replaceable under traffic conditions.

12XXX.03CONSTRUCTION.

A. Installation.
Install according to the manufacturer's recommendations.

B. Maintenance.
Repair or replace all damaged curb units or posts no later than 24 hours after the damage is reported to the Contractor.

C. Removal.

1. Repair all holes left in the pavement or bridge deck when the temporary lane separator system is removed. Holes shall be filled with a non shrink grout meeting the requirements of Materials I.M. 491.13.

2. Upon completion of the project, the temporary lane separator system will remain the property of the Contractor for systems used in temporary traffic control zones. When placed as part of a permanent installation, the system will become the property of the Contracting Authority.

12XXX.04METHOD OF MEASUREMENT.
The Engineer will measure the length of the Temporary Lane Separator System installed in feet (meters).

12XXX.05BASIS OF PAYMENT.
For the number of feet (meters) of Temporary Lane Separator System measured, the Contractor will be paid the contract unit price per foot (meter). Payment includes installation, maintenance, repair, removal of the temporary lane separator system (if installed in a temporary traffic control zone), and all required pavement or bridge deck repair.