MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING

November 9, 2023

Members Present:	Darwin Bishop	District 3 – DCE
	Mark Dunn	Contracts & Specifications Bureau
	Daniel Harness	Design Bureau
	Eric Johnsen, Chair	Contracts & Specifications Bureau
	Mike Nop	Bridges & Structures Bureau
	Willy Sorenson	Traffic & Safety Bureau
	Wes Musgrove	Construction & Materials Bureau
	Scott Nixon	District 1 - DCE
	Dillon Feldmann	Local Systems Bureau
	Bob Welper	District 2 - DME
Members Not Present:	Charlie Purcell	Project Delivery Division
Advisory Members Present:	David Carney	SUDAS
	Andy Case	Dallas County
	Ben Daleske	Fayette County
	Jeff Devries	Construction & Materials Bureau
	Scott Sommers	Construction & Materials Bureau
	Asley Buss	Construction & Materials Bureau
	Kuma Chibsa	FHWA

The Specification Committee met on Thursday, November 9, 2023, at 9:00 a.m. Eric Johnsen, Specifications Engineer, opened the meeting. The items were discussed in accordance with the agenda dated October 30, 2023.

The minutes are as follows:

1. Article 1107.06, B, 2, Federal Requirement.

The Construction and Materials Bureau requested to update construction materials as related to BABA.

2. Article 2301.03, A, 3, a, 6, a, Vibrators (PCC Pavement).

The Construction and Materials Bureau requested to allow working PCC vibrators to still be used if the sensors have stopped working.

3. Article 2317.04, F, Corrective Actions.

The Construction and Materials Bureau requested to update distance the Contractor will not be responsible for when evaluating smoothness at the beginning or end of a project.

4. Article 2527.02, D, 2, Traffic Paint (Pavement Markings).

The Construction and Materials Bureau requested to update durable and high-build waterborne pavement

markings due to industry discussions and common practices utilized by other states.

5. Article 2527.02, D, 5, Raised Pavement Markers.

The Construction and Materials Bureau requested to provide specifications for plowable raised retroreflective markers.

6. Article 2527.03, H, 2, a, Groove Width.

Article 2527.04, B, Method of Measurement.

The Design Bureau requested to update tolerance on grooving width and start adjustment to a standard 6 inch pavement marking line width.

7. Article 2532.03, Pavement Surface Repair (Diamond Grinding).

The Construction and Materials Bureau requested to update diamond grinding specifications.

8. Section 2557, Portland Cement Concrete Pavement Grooving.

The Construction and Materials Bureau requested to add specifications for grooving PCC pavement with limestone coarse aggregate.

9. Section 4136, Joint Fillers, Sealers and Seals.

The Construction and Materials Bureau requested to update obsolete references.

10. Article 4148.01, Drain Tiles.

The Construction and Materials Bureau requested to update obsolete references.

11. Article 4151.02, B, Steel Reinforcement.

The Construction and Materials Bureau requested to include elliptical bars and update epoxy requirement reference.

12. Article 4188.01, Traffic Control Devices.

The Construction and Materials Bureau requested to add attenuators to category 3 devices.

13. DS-23043, Multi-Component Liquid Pavement Markings.

The Design Bureau requested approval revisions to Developmental Specifications for Multi-Component Liquid Pavement Markings.

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove; Jeff De Vries	**Office:** Construction & Materials	**Item 1**
Submittal Date: October 13, 2023	**Proposed Effective Date:** April 2024	
Article No.: 1107.06, B, 2 **Title:** Federal Requirement	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:**

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: Revisions will be issued as SS-23006 for the December 19 Letting with the revised Materials I.M. 107 attached.

Specification Section Recommended Text:

1107.06, B, 2.

Replace the bulleted items:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- fiber-optic cable (including drop cable);
- optical fiber;
- lumber; ~~or~~
- engineered wood; or
- drywall.

Comments: This revision will be implemented by Supplemental Specification for the December letting.

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

2. All construction materials shall be produced in the United States. Construction materials are defined as an article, material, or supply that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- fiber-optic cable (including drop cable);
- optical fiber;
- lumber; ~~or~~
- engineered wood;
- drywall;

Reason for Revision: The Whitehouse has added three new items to the list of what is considered a construction material.

New Bid Item Required (X one)	**Yes**	**No** x

Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x
Comments: Possible early application request by plan note.		
County or City Comments:		
Industry Comments:		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove; Todd Hanson	**Office:** Construction & Materials	**Item 2**
Submittal Date: October 13, 2023	**Proposed Effective Date:** April 2024	
Article No.: 2301.03, A, 3, a, 6, a **Title:** Vibrators (PCC Pavement)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text:

2301.03, A, 3, a, 6, a, Vibrators.

Replace Articles 7 through 9:

(7) Use a vibrator monitoring device that meets all of the following:

(a) Has a readout display near the operator's controls visible to the paver operator and the Engineer.

(b) Operates continuously while paving.

(c) Displays all vibrator frequencies with manual or automatic sequencing among all individual vibrators.

(d) Records, at a minimum, the clock time, station location, paver track speed, and operating frequency of individual vibrators. Make recordings after each 25 feet of paving or after each 5 minutes of time. In lieu of recording device, a non-recording, electronic monitor may be mounted on side of paver to display vibration frequency.

(8) Provide the Engineer with an electronic record daily for the first 3 days of paving and weekly thereafter. The Engineer may determine that more frequent submission is necessary, particularly if equipment malfunctions occur. When using a non-recording, electronic monitor to display vibration frequency, manually record vibrators once per day.

(9) If the electronic monitoring ~~device~~ sensor in the vibrator fails to operate properly, manually check vibrators immediately. If vibrators are functioning properly, paving may continue~~, but correct the problem as soon as possible with~~ with manual checking every 4 hours of operation. Increase frequency of manual checks if changes in concrete mix or paving operation occur. Engineer will witness and document readings. If recording device or vibrator display fails to operate, paving may continue with manual checking, but correct the malfunction ~~within 3 paving days~~ prior to use on next project. ~~The Engineer may allow additional time if circumstances are beyond the Contractor's control.~~

Comments: The last sentence was deleted, as everything should be in working order when showing up to a new project.

Specification Section Recommended Text:

2301.03, A, 3, a, 6, a, Vibrators.

Replace Articles 7 through 9:

(7) Use a vibrator monitoring device that meets all of the following:

(a) Has a readout display near the operator's controls visible to the paver operator and the Engineer.

(b) Operates continuously while paving.

(c) Displays all vibrator frequencies with manual or automatic sequencing among all

individual vibrators.

(d) Records, at a minimum, the clock time, station location, paver track speed, and operating frequency of individual vibrators. Make recordings after each 25 feet of paving or after each 5 minutes of time. In lieu of recording device, a non-recording, electronic monitor may be mounted on side of paver to display vibration frequency.

(8) Provide the Engineer with an electronic record daily for the first 3 days of paving and weekly thereafter. The Engineer may determine that more frequent submission is necessary, particularly if equipment malfunctions occur. When using a non-recording, electronic monitor to display vibration frequency, manually record vibrators once per day.

(9) If the electronic monitoring ~~device~~ sensor in the vibrator fails to operate properly, manually check vibrators immediately. If vibrators are functioning properly, paving may continue~~, but correct the problem as soon as possible with~~ with manual checking every 4 hours of operation. Increase frequency of manual checks if changes in concrete mix or paving operation occur. Engineer will witness and document readings. If recording device or vibrator display fails to operate, paving may continue with manual checking, but correct the malfunction ~~within 3 paving days~~ prior to use on next project. The Engineer may allow additional time if circumstances are beyond the Contractor's control.

Comments: Should the final sentence be deleted also?

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

2301.03, A, 3, a, Vibrators

(6) Use an electronic vibrator monitoring device displaying the operating frequency of each individual internal vibrator for all Interstate and Primary contracts with PCC paving quantities of mainline paving over 50,000 square yards and other projects when specified in the contract documents. When required on a contract, the vibrator monitoring device will only be required in areas where mainline pavement length exceeds 600 feet. When project staging necessitates small mainline sections be paved separately from the majority of mainline paving, the Engineer may waive this requirement for those small sections.

(7) Use a vibrator monitoring device that meets all of the following:

(a) Has a readout display near the operator's controls visible to the paver operator and the Engineer.

(b) Operates continuously while paving.

(c) Displays all vibrator frequencies with manual or automatic sequencing among all individual vibrators.

(d) Records, at a minimum, the clock time, station location, paver track speed, and operating frequency of individual vibrators. Make recordings after each 25 feet of paving or after each 5 minutes of time. In lieu of recording device, a non-recording, electronic monitor may be mounted on side of paver to display vibration frequency.

(8) Provide the Engineer with an electronic record daily for the first 3 days of paving and weekly thereafter. The Engineer may determine that more frequent submission is necessary, particularly if equipment malfunctions occur. When using a non-recording, electronic monitor to display vibration frequency, manually check vibrators once per day.

(9) If the electronic monitoring ~~device~~ sensor in the vibrator fails to operate properly, manually check vibrators immediately. If vibrators are functioning properly, paving may continue~~, but correct the problem as soon as possible with~~ with manual checking, every 4 hours of operation. Frequency of manual checks may increase, if changes in concrete mix or paving operation occur. Engineer will witness and document readings. If recording device or vibrator display fails to operate, paving may continue with manual checking, but correct the malfunction prior to use on next project ~~within 3 paving days~~. The Engineer may allow additional time if circumstances are beyond the Contractor's control.

Reason for Revision: Some contractors have spent over $250,000 per year replacing vibrators that

are still working, but the sensor is out. Sensors are not robust enough to take the vibration. If vibrators are still operating, there is no need to remove them and add cost. Contractor can monitor and report to the inspector during construction. Recorded data has been poor at best. Reality is we only need to know vibration frequency during placement. If vibration is outside parameters make changes and continue paving.		
New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x
Comments:		
County or City Comments:		
Industry Comments: Industry brought issue to our attention. ICPA has reviewed and gathered industry comments. CQI topic.		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove; Jeff De Vries	**Office:** Construction & Materials	**Item 3**
Submittal Date: October 24, 2023	**Proposed Effective Date:** April 2024	
Article No.: 2317.04, F **Title:** Corrective Actions	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2317.04, F, Corrective Work.

Replace the first paragraph of the Article:

When the Contractor is not responsible for the adjoining surface, ALR in the ~~20~~ 45 feet at the beginning or end of a section will be reviewed by the Engineer. Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B. Correct ALR determined to be under the control of the Contractor and resulting from the Contractor's operations. ~~Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B~~. Complete the corrective work prior to determining pavement thickness. Do not use bush hammers or other impact devices.

Comments:

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

F. Corrective Work.

When the Contractor is not responsible for the adjoining surface, ALR in the 45~~20~~ feet at the beginning or end of a section will be reviewed by the Engineer. Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B Correct ALR determined to be under the control of the Contractor and resulting from the Contractor's operations. ~~Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B~~. Complete the corrective work prior to determining pavement thickness. Do not use bush hammers or other impact devices.

Reason for Revision: In the past we have not tested or evaluated smoothness in the first 16 feet of pavement due to past equipment limitation. We wanted all wheels on the new pavement before beginning the testing for bumps and dips or evaluating for PI. When looking at ALR, the ALR is a rolling a 25 foot average. The contractor should not be held accountable until all wheels of the test vehicle are on the new pavement. Current equipment requires 20 feet. The first complete ALR section should be at 45' from the end.

New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x

Comments: Possible early application request by plan note.
County or City Comments:
Industry Comments:

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brian Worrel / Ben Hucker	**Office:** Construction & Materials	**Item 4**
Submittal Date: October 17, 2023	**Proposed Effective Date:** April 2024	
Article No.: 2527.02, D, 2 **Title:** Traffic Paint (Pavement Markings)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text:
2527.02, D, 2, Traffic Paint.

Replace Articles b through d:

b. Waterborne and Solvent-based Paint.

1) Meet the requirements of Section 4183 for fast dry paint.

2) Use the nominal application paint and glass bead rates shown in Tables 2527.02-1 and 2527.02-2:

Table 2527.02-1: Waterborne Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4" 6"	14 mils 18 mils	343.7 ft. of solid line per gallon of paint. 178.2 ft. of solid line per gallon of paint.	9.0 lb./gal. 11.0 lb./gal.

Table 2527.02-2: Solvent-based Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4" 6"	16 mils 18 mils	300.8 ft. of solid line per gallon of paint. 178.2 ft. of solid line per gallon of paint.	9.0 lb./gal. 11.0 lb./gal.

c. Durable Paint Pavement Markings.

1) Meet requirements of Article 4183.04.

2) Provide the Engineer with a copy of the manufacturer's recommendations for applying the marking material upon request. Install the marking material according to the product manufacturer's recommendations. ~~Use the same~~ Provide a minimum binder thickness ~~as applied on the National Transportation Product Evaluation Program (NTPEP) AASHTO Product Evaluations and Audit Solutions deck with a tolerance of 10%~~ of 25 mils. The minimum bead application rate shall be 15 pounds per gallon, bead gradation is AASHTO M 247 Type 3 or as approved by the Engineer, and bead coating is ~~at the discretion of the Contractor~~ as recommended by the manufacturer of the durable paint product. ~~Use an appropriate~~ Modify the bead package as necessary to consistently meet or exceed the minimum retroreflectivity requirements. For wet reflective applications, mix paint with 5 pounds per gallon of reflective spheres / elements meeting Materials I.M. 484 Appendix B.

3) Demonstrate to the Engineer at the start of the project the ability to meet the retroreflectivity requirements of these specifications when tested ~~according to~~ Materials I.M. 483.04. The Engineer may also require the Contractor to demonstrate the ability to meet the initial retroreflectivity requirements if there is a change in equipment, materials, or a delay of more than 2 months in completing the project.

4) Final acceptance will be based on compliance with these specifications. Ensure the markings meet the following retroreflectivity requirements. ~~The Engineer will u~~Use the procedure

in Materials I.M. 386 to determine retroreflectivity. Provide average retroreflective values per mile to the Engineer. The Engineer may help define locations for measurement of retroreflectivity. In no case should there be less than five retroreflectivity checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retroreflectivity values.

Minimum Coefficient of Retroreflected Luminance mcd/sq.ft./ft.-cdl.	
White line, symbols, and legends	300
Yellow line	200

d. High-Build Waterborne Paint Pavement Markings.

1) Provide high build waterborne paint listed in Materials I.M. 483.03, Appendix C.

2) ~~Supply Engineer with a copy of paint manufacturer's recommendations for applying marking material. Include in recommendations minimum pavement temperature required for painting. Install paint according to manufacturer's recommendations.~~ Provide binder thickness of ~~0.022~~ 0.025 inches ± ~~0.0025~~ 0.0035 inches. Use glass beads / elements complying with Materials I.M. 484. Use a Bead application rate~~,~~ of 15 pounds per gallon. Utilize AASHTO M 247 Type 3 bead gradation~~,~~. ~~and~~ Use bead coatings ~~is at the discretion of the Contractor~~ as recommended by the manufacturer of the high-build paint product. Provide a bead package that will ensure initial retroreflectivity requirements consistently at or above the minimum. For wet reflective applications, mix paint with 5 pounds per gallon of reflective spheres / elements meeting Materials I.M. 484 Appendix B.

3) Demonstrate to Engineer at start of work the ability to meet initial retroreflectivity requirements.

4) Final acceptance will be based on compliance with these specifications. Ensure markings meet the following retroreflectivity requirements. Provide average retroreflective values per mile to the Engineer. The Engineer may help define locations for measurement of retroreflectivity. In no case should there be less than five retroreflectivity checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retroreflectivity values.

Minimum Coefficient of Retroreflected Luminance mcd / sq. ft. / ft.-cdl.	
White longitudinal lines	300
Yellow longitudinal lines	225

~~The Engineer will use the procedure in Materials I.M. 386 to determine retroreflectivity.~~

Comments: Scott Sommers provided clarification on the binder thickness for high-build waterborne pavement markings.

Specification Section Recommended Text:

2527.02, D, 2, Traffic Paint.

Replace Articles b through d:

b. Waterborne and Solvent-based Paint.

1) Meet the requirements of Section 4183 for fast dry paint.

2) Use the nominal application paint and glass bead rates shown in Tables 2527.02-1 and 2527.02-2:

Table 2527.02-1: Waterborne Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4"	14 mils	343.7 ft. of solid line per gallon of paint.	9.0 lb./gal.
6"	18 mils	178.2 ft. of solid line per gallon of paint.	11.0 lb./gal.

Table 2527.02-2: Solvent-based Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4"	16 mils	300.8 ft. of solid line per gallon of paint.	9.0 lb./gal.
6"	18 mils	178.2 ft. of solid line per gallon of paint.	11.0 lb./gal.

c. Durable Paint Pavement Markings.

1) Meet requirements of Article 4183.04.

2) Provide the Engineer with a copy of the manufacturer's recommendations for applying the marking material upon request. Install the marking material according to the product manufacturer's recommendations. ~~Use the same~~ Provide a minimum binder thickness ~~as applied on the National Transportation Product Evaluation Program (NTPEP) AASHTO Product Evaluations and Audit Solutions deck with a tolerance of 10%~~ of 25 mils. The minimum bead application rate shall be 15 pounds per gallon, bead gradation is AASHTO M 247 Type 3 or as approved by the Engineer, and bead coating is ~~at the discretion of the Contractor~~ as recommended by the manufacturer of the durable paint product. ~~Use an appropriate~~ Modify the bead package as necessary to consistently meet or exceed the minimum retroreflectivity requirements. For wet reflective applications, mix paint with 5 pounds per gallon of reflective spheres / elements meeting Materials I.M. 484 Appendix B.

3) Demonstrate to the Engineer at the start of the project the ability to meet the retroreflectivity requirements of these specifications when tested ~~according to~~ Materials I.M. 483.04. The Engineer may also require the Contractor to demonstrate the ability to meet the initial retroreflectivity requirements if there is a change in equipment, materials, or a delay of more than 2 months in completing the project.

4) Final acceptance will be based on compliance with these specifications. Ensure the markings meet the following retroreflectivity requirements. ~~The Engineer will~~ ~~u~~Use the procedure in Materials I.M. 386 to determine retroreflectivity. Provide average retroreflective values per mile to the Engineer. The Engineer may help define locations for measurement of retroreflectivity. In no case should there be less than five retroreflectivity checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retroreflectivity values.

Minimum Coefficient of Retroreflected Luminance mcd/sq.ft./ft.-cdl.	
White line, symbols, and legends	300
Yellow line	200

d. High-Build Waterborne Paint Pavement Markings.

1) Provide high build waterborne paint listed in Materials I.M. 483.03, Appendix C.

2) ~~Supply Engineer with a copy of paint manufacturer's recommendations for applying marking material. Include in recommendations minimum pavement temperature required for painting. Install paint according to manufacturer's recommendations.~~ Provide binder thickness of ~~0.022~~ 0.025 inches ~~± 0.0025~~ to 0.035 inches. Use glass beads / elements complying with Materials I.M. 484. Use a Bead application rate~~,~~ of 15 pounds per gallon. Utilize AASHTO M 247 Type 3 bead gradation~~,~~. ~~and~~ Use bead coatings ~~is at the discretion of the Contractor~~ as recommended by the manufacturer of the high-build paint product. Provide a bead package that will ensure initial retroreflectivity requirements consistently at or above the minimum. For wet reflective applications, mix paint with 5 pounds per gallon of reflective spheres / elements meeting Materials I.M. 484 Appendix B.

3) Demonstrate to Engineer at start of work the ability to meet initial retroreflectivity requirements.

4) Final acceptance will be based on compliance with these specifications. Ensure markings meet the following retroreflectivity requirements. Provide average retroreflective values per mile to the Engineer. The Engineer may help define locations for measurement of retroreflectivity. In no case should there be less than five retroreflectivity checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retroreflectivity values.

Minimum Coefficient of Retroreflected Luminance mcd / sq. ft. / ft.-cdl.	
White longitudinal lines	300
Yellow longitudinal lines	225

~~The Engineer will use the procedure in Materials I.M. 386 to determine retroreflectivity.~~

Comments:

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

2527.02 Materials

D. Materials for pavement markings are described below:

1. Wet, Retroreflective Removable Tape Markings.

a. Meet the requirements of Article 4183.06, A, and prequalified for use according to Materials I.M. 483.06.

b. Complying with the following:

1) Preformed markings consist of white or yellow films providing immediate and continuing retroreflection during dry, wet, and rainy conditions.

2) Nominal width of 4 inches.

3) Flexible and formable.

4) Ensure tape is capable of performing for the duration of a normal construction season and being removed intact or in large pieces. Ensure tape is reflective throughout its useful life. Normal construction season is defined as the time between the last snowplowing in the spring and the first snowplowing in the fall/winter.

5) Ensure tape design and manufacture allows it to be readily removed when markings are no longer needed.

2. Traffic Paint.

a. General.

1) Use painting equipment complying with the following:

a) Capable of placing two lines simultaneously with either line in a solid or intermittent pattern in yellow or white.

b) Capable of applying glass beads at the required rate.

c) All guns in full view of the operator at all times.

d) Equipped with a metering device to register the accumulated length for each gun, each day.

e) Designed so that the pressure gages for each proportioning pump are visible to the operator at all times during operation to monitor fluctuations in pressure.

2) Apply reflectorizing spheres meeting requirements of Section 4184 to the painted lines. Apply the paint without dilution using mechanical equipment intended for that purpose. Apply the reflectorizing spheres immediately to the wet paint with a pressurized system.

b. Waterborne and Solvent-based Paint.

1) Meet the requirements of Section 4183 for fast dry paint.

2) Use the nominal application paint and glass bead rates shown in Tables 2527.02-1 and 2527.02-2:

Table 2527.02-1: Waterborne Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4" 6"	14 mils 18 mils	343.7 ft. of solid line per gallon of paint. 178.2 ft. of solid line per gallon of paint.	9.0 lb./gal. 11.0 lb./gal.

Table 2527.02-2: Solvent-based Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4" 6"	16 mils 18 mils	300.8 ft. of solid line per gallon of paint. 178.2 ft. of solid line per gallon of paint.	9.0 lb./gal. 11.0 lb./gal.

c. Durable Paint Pavement Markings.

1) Meet requirements of Article 4183.04.

2) Provide the Engineer with a copy of the manufacturer's recommendations for applying the marking material upon request. Install the marking material according to the product manufacturer's recommendations. Use ~~the same~~ a binder thickness of minimum 25 mils. ~~as applied on the National Transportation Product Evaluation Program (NTPEP) AASHTO~~

~~Product Evaluations and Audit Solutions deck with a tolerance of 10%~~. The minimum bead application rate is 15 lbs/gal, bead gradation is AASHTO M 247 Type 3 or as approved by the engineer, and bead coating is as recommended by the durable paint product utilized ~~at the discretion of the Contractor~~. ~~Use an appropriate~~ Modify the bead package as necessary to consistently meet or exceed the minimum retro reflectivity requirements. For Wet reflective applications mix with 5 lbs/gallon of IM 484 Appendix B reflective spheres / elements.

3) Demonstrate to the Engineer at the start of the project the ability to meet the retro reflectivity requirements of these specifications when tested ~~according to~~ Materials I.M. 483.04. The Engineer may also require the Contractor to demonstrate the ability to meet the initial retro reflectivity requirements if there is a change in equipment, materials, or a delay of more than 2 months in completing the project.

4) Final acceptance will be based on compliance with these specifications. Ensure the markings meet the following retro reflectivity requirements. ~~The Engineer will u~~Use the procedure in Materials I.M. 386 to determine retro reflectivity. Provide average retro reflective values per mile to the engineer. The Engineer may help define locations for measurement of retro-reflectivity. In no case should there be less than 5 retro checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retro values.

Minimum Coefficient of Retroreflected Luminance mcd/sq.ft./ft.-cdl.	
White line, symbols, and legends	300
Yellow line	200

d. High-Build Waterborne Paint Pavement Markings.

1) Provide high build waterborne paint listed in Materials I.M. 483.03, Appendix C.

2) ~~Supply Engineer with a copy of paint manufacturer's recommendations for applying marking material. Include in recommendations minimum pavement temperature required for painting. Install paint according to manufacturer's recommendations~~. Provide binder thickness of 0.025~~2~~ inches ~~±~~ -0.000 +0.01~~02~~ inches. Utilize glass beads / elements from IM 484 manufacturers. Use a Bead application rate of 15 lbs/gallon. Utilize AASHTO M 247 Type 3 bead gradation. Utilize ~~and~~ bead coatings ~~is at the discretion of the Contractor~~ as recommended by the paint manufacturers recommendations for the Hi-Build product being utilized. Provide a bead package that will ensure initial retro reflectivity requirements consistently at or above the minimum. For Wet reflective applications mix with 5 lbs/gallon of IM 484 Appendix B reflective spheres / elements.

3) Demonstrate to Engineer at start of work the ability to meet initial retro reflectivity requirements.

4) Final acceptance will be based on compliance with these specifications. Ensure markings meet the following retro reflectivity requirements.

Minimum Coefficient of Retroreflected Luminance mcd / sq. ft. / ft.-cdl.	
White longitudinal lines	300
Yellow longitudinal lines	225

~~The Engineer will use the procedure in Materials I.M. 386 to determine retroreflectivity.~~ The Contractor will supply the average retroreflective values per mile to the engineer. The Engineer may help define locations for measurement of retro-reflectivity. In no case should there be less than 5 retro checks per mile. Number of checks will be averaged against values obtained to determine compliance to minimum retro values.

Reason for Revision: Update durable pavement marking specifications due to increased usage, industry discussions and common practices utilized by other states. Update Hi-build waterborne paint pavement markings based on industry discussions and common practices utilized by other states.

New Bid Item Required (X one)	**Yes** ?	**No**
Bid Item Modification Required (X one)	**Yes** ?	**No**

Bid Item Obsoletion Required (X one)	**Yes**	**No**
Comments:		
County or City Comments:		
Industry Comments: Industry is supportive		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brian Worrel	**Office:** Construction & Materials	**Item 5**
Submittal Date: Oct 12, 2023	**Proposed Effective Date:** April 2024	
Article No.: 2527.02 D 5 **Title:** Raised Pavement Markers	**Other:**	

Specification Committee Action: Deferred to a future meeting.

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

Specification Committee Approved Text:

Comments: Traffic and Safety Bureau was concerned that the specification could be interpreted as allowing permanent raised pavement markers, which haven't been used in Iowa since a death in Missouri due to a dislodged marker. Traffic and Safety will review and consult with Construction and Materials on whether broader changes are needed to this Article, to clarify that they are only to be used in temporary situations.

Specification Section Recommended Text:

2527.02, D, 5, b.

Replace the Article:

Ensure standard markers that will be continually exposed to traffic, when installed, do not extend more than 3/4 inch above the pavement surface. Ensure plowable raised retroreflective markers comply with ASTM D 4383. Use markers that comply with Materials I.M. 483.07.

Comments:

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

5. Raised Pavement Markers.

a. These markers are intended for temporary use to provide retro-reflective pavement markings. Place in addition to other pavement markings, when specified. Use markers for which the reflective surface or surfaces:

- Have a minimum area of 1/2 square inch,
- Are of the color required, and
- Provide reflectance from approaching headlights.

b. Ensure standard markers that will be continually exposed to traffic, when installed, do not extend more than 3/4 inch above the pavement surface. Ensure plowable raised retroreflective markers comply to ASTM D4383. Use markers that comply with Materials I.M. 483.07.

Reason for Revision: Due to our snowplow usage in Iowa an option for providing plowable raised retroreflective markers is desired to supplement lane markings as needed.

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X

Comments:
County or City Comments:
Industry Comments:

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly / Daniel Harness / Ben Hucker	**Office:** Design	**Item 6**
Submittal Date: 10/17/23	**Proposed Effective Date:** April 2024	
Article No.: 2527.03, H, 2, a **Title:** Groove Width **Article No.:** 2527.04, B **Title:** Method of Measurement	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: All 2527 bid items measured in Stations will need to be replaced, so that the new 6 inch factor width can be accounted for in the field. Fourteen bid items will be obsoleted with the March Letting and new bid items will be issued for the April letting.

Specification Section Recommended Text:

2527.03, H, 2, a, Groove Width.

Replace the Article:

For lines, a minimum of 8 inch width or the marking width plus 1 inch each side of marking, whichever is greater, with a tolerance of +/- 0.25 inches. For symbols and legends, extend grooving 1 inch beyond the most extreme edge of the symbol in an allowable pattern as shown in the contract documents. Minimize grooved margin around symbols as determined by the Engineer.

2527.04, B.

Replace the Article:

The Engineer will measure the number of stations, based on a single ~~4~~ 6 inch width, of painted, taped, and/or removed line. The length of each type of markings will be determined using beginning and ending points, and adjusting for breaks at side roads, median crossings, station equations, or other locations shown in the contract documents. The measurement for dashed and dotted lines will be adjusted to exclude skips. Measurement of lines wider or narrower than ~~4~~ 6 inches will be adjusted by the quantity factor to a ~~4~~ 6 inch line.

Comments:

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

2527.03, H, 2, a, Groove Width.

Replace the article:

For lines, a ~~M~~minimum of 8 inch width or the marking width plus 1 inch each side of marking, whichever is greater, with a tolerance of ~~minus 0.0 inches and plus~~ +/- 0.25 inches. For

symbols and legends, extend grooving 1 inch beyond the most extreme edge of the symbol in an allowable pattern as shown in the contract documents. Minimize grooved margin around symbols as determined by the Engineer.

2527.04, B.

Replace the article:

The Engineer will measure the number of stations, based on a single ~~4~~ 6 inch width, of painted, taped, and/or removed line. The length of each type of markings will be determined using beginning and ending points, and adjusting for breaks at side roads, median crossings, station equations, or other locations shown in the contract documents. The measurement for dashed and dotted lines will be adjusted to exclude skips. Measurement of lines wider or narrower than ~~4~~ 6 inches will be adjusted by the quantity factor to a ~~4~~ 6 inch line.

Reason for Revision: Article 2527.03, H, 2, a, Groove Width: this was approved during the September 2023 meeting. After the approval, Ben Hucker attended the ATSSA meeting where he was informed the blades stacked together for grooving come in 0.25 inch increments, so our tolerance of +/-0.2 inches needs to be changed to +/-0.25 inches (dark grey). Also, “marking” was misspelled as “making”.

2527.04, B: over time, we will be moving toward a 6 inch standard line for the normal lane markings. Due to design tab software changes taking place now, Design is requesting to change the pay factors to base off of a 6 inch line to eliminate the need to re-program the tab software in a few years. This will bring our Method of Measurement in line with design tabs in adjusting quantities to a 6” Pavement marking line width.

New Bid Item Required (X one)	**Yes** X	**No**
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes** X	**No**

Comments: We have been in coordination with the AASHTOWare Project (AWP) team and have sought their comments. Since this change will take effect after the sunset of FieldBook/FieldManager, only AWP pavement marking pay factors will need to be updated as a result of this change. We’re working closely with them to ensure those changes are completed in alignment with the change in April 2024.

Since this will impact RCEs and construction inspectors, we’ll be attending all winter construction seminars this coming winter to discuss this change and provide pamphlets outlining the differences. Once the changes are explained and AWP is in alignment, no significant impact is expected.

County or City Comments: We will be in contact with the Local Systems Bureau to share similar information with the local agencies, so they are aware as well. This will not force them to go to 6 inch lines, but they will need to be aware so they can take the new pay factors into account when designing their projects.

Industry Comments: Industry (ATSSA) will be made aware of this change at their fall meeting on October 18th. We have been in discussions with them about this and no significant feedback is expected, and we will share the same information with them as we share with the inspectors as well.

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Todd Hanson	**Office:** Construction Materials	**Item 7**
Submittal Date: October 13, 2023	**Proposed Effective Date:** April 2024	
Article No.: 2532.03 **Title:** Pavement Surface Repair (Diamond Grinding)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2532.03, A, Equipment.

Add the Article, **renumber** following Articles, and **replace** new Article 4:

2. Provide equipment with an effective wheelbase, or the distance between front wheel assembly transverse pivot point to the profile depth control drive wheels transverse pivot point, of no less than 12 feet.

~~**2**~~ **3.** Do not use grinding and texturing equipment that causes excessive ravels, aggregate fractures, spalls, or disturbance of the transverse and/or longitudinal joints.

~~**3**~~ **4.** Use grinding equipment with a minimum effective head width of ~~36~~ 48 inches. For corrective work, use a minimum effective head of 36 inches.

~~**4**~~ **5.** Select the blade type and number of blades per foot (meter) to provide proper surface texture based on the concrete being ground, in particular, the coarse aggregate type.

2532.03, B, 1, e.

Replace the Article:

For multiple passes, carefully control the equipment to minimize the overlap. Ensure overlaps do not exceed ~~1 inch~~ 2 inches.

2532.03, B, 1, General.

Add the Article:

i. When the coarse aggregate used in the existing pavement is limestone, longitudinally groove the surface after grinding in accordance with Section 2557.

2532.03, C, 1, a.

Replace the last sentence:

The availability of this information will not constitute a guarantee that a profile other than that indicated will not be encountered at the time of ~~milling~~ grinding.

Comments:

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

2532.03 CONSTRUCTION.

A. Equipment.

1. Perform grinding and texturing using diamond blades mounted on a self propelled machine that has been designed for grinding and texturing concrete surfaces. Ensure the equipment will not cause strain or damage to the underlying pavement.

2. Provide equipment with an effective wheelbase, or the distance between front wheel assembly transverse pivot point to the profile depth control drive wheels transverse pivot point, of no less than 12 feet.

3.~~2.~~ Do not use grinding and texturing equipment that causes excessive ravels, aggregate fractures, spalls, or disturbance of the transverse and/or longitudinal joints.

4.~~3.~~ Use grinding equipment with a minimum effective head width of ~~36~~ 48 inches. For corrective work, use a minimum effective head of 36 inches.

5.~~4.~~ Select the blade type and number of blades per foot (meter) to provide proper surface texture based on the concrete being ground, in particular, the coarse aggregate type.

B. Pavement Surface Repair.

1. General.

a. Grind and texture the concrete surface in a longitudinal direction.

b. Ensure the surface, after grinding, is of uniform texture.

c. When using more than one grinding machine in the same travel lane, use similar blade segment thicknesses, blade spacings, and blade diameters on all machines so the texture of the ground surface is reasonably uniform across the lane.

d. To be in compliance, the land area and the texture depth shall be within the specified ranges. It may be necessary to adjust the blade spacing during a project to stay within specified ranges.

e. For multiple passes, carefully control the equipment to minimize the overlap. Ensure overlaps do not exceed ~~1 inch~~ 2 inches.

f. Ensure that, after grinding, the transverse slope of the concrete surface is uniform to a degree that there are no depressions or misalignment of slope greater than 1/4 inch in 12 feet when tested by stringline or straightedge placed perpendicular to the center line.

g. In order to match the outside edge of the pavement, grind adjacent paved areas (for example shoulders, curb and gutter, turn lanes, tapers, paved crossovers, and so forth) to minimize vertical projections.

h. The Contractor is responsible for quality control of the texture. The Engineer will conduct random Quality Assurance inspections.

i. When the coarse aggregate used in the existing pavement is limestone, longitudinally groove the surface after grinding in accordance with Section 2557.

C. Smoothness.

1. PCC Pavement.

a. The Engineer may partly profile the pavement using an inertial profiler. The latest inventory average international roughness index (IRI) for each area may be shown in the contract documents. The bidder is also advised that any available profile information is available electronically from the Office of Contracts by contacting the Contracts Engineer. This information represents a summary of conditions found to exist at the time the survey was made. The availability of this information will not constitute a guarantee that a profile other than that

indicated will not be encountered at the time of ~~milling~~.grinding		
Reason for Revision: Friction testing has shown a decrease in friction numbers rather quickly when the coarse aggregate is a calcitic limestone. Test sections that include grooving have shown an increase in friction numbers with the smooth tire testing. Adding a new section 2557 PCC Pavement Grooving. Industry preferred a separate section from grinding.		
New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x
Comments:		
County or City Comments:		
Industry Comments: This topic came from the CQI committee with the ICPA. ICPA has reviewed and gathered comments from industry to help develop the changes.		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Todd Hanson	**Office:** Construction Materials	**Item 8**
Submittal Date: October 13, 2023	**Proposed Effective Date:** April 2024	
Section No.: 2557 (NEW) **Title:** PCC Pavement Grooving	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text:

2557, Portland Cement Concrete Pavement Grooving.

Add the Section:

Section 2557. Portland Cement Concrete Pavement Grooving

2557.01 DESCRIPTION.

Use diamond grooving equipment to produce longitudinal grooves on existing PCC pavement surface.

2557.02 MATERIALS.

None

2557.03 CONSTRUCTION.

A. Equipment.

Use equipment meeting Article 2532.03, A.

B. Pavement Grooving.

1. Use equipment with longitudinal grooving blades 0.95 inches ± 0.05 inches wide.

2. Cut grooves meeting the following:

a. 1/8 inch ±1/16 inch wide,

b. 1/8 inch to 3/16 inch deep and,

c. Uniformly spaced at 3/4 inch intervals, measured center to center of groove.

3. Ensure grooves are parallel to centerline of the roadway.

4. Do not groove within 3 inches of longitudinal joint or edge of pavement.

C. Limitations

Observe limitations in Article 2532.03, D.

2557.04 METHOD OF MEASUREMENT.

Square yards of Longitudinal Grooving of Concrete, Pavement, shown in contract documents

2557.05 BASIS OF PAYMENT.

Contract unit price per square yard for Longitudinal Grooving of Concrete, Pavement.

Comments: The bid item name was revised to match the existing bid item name for longitudinal grooving of bridge decks.

Bid item 2412-0000100, Longitudinal Grooving of Concrete will have ", Bridge Deck" added to differentiate it from the new bid item.

Specification Section Recommended Text:

2557, Portland Cement Concrete Pavement Grooving.

Add the Section:

Section 2557. Portland Cement Concrete Pavement Grooving

2557.01 DESCRIPTION.

Use diamond grooving equipment to produce longitudinal grooves on existing PCC pavement surface.

2557.02 MATERIALS.

None

2557.03 CONSTRUCTION.

A. Equipment.

Use equipment meeting Article 2532.03, A.

B. Pavement Grooving.

1. Use equipment with longitudinal grooving blades 0.95 inches ± 0.05 inches wide.

2. Cut grooves meeting the following:

a. 1/8 inch ±1/16 inch wide,

b. 1/8 inch to 3/16 inch deep and,

c. Uniformly spaced at 3/4 inch intervals, measured center to center of groove.

3. Ensure grooves are parallel to centerline of the roadway.

4. Do not groove within 3 inches of longitudinal joint or edge of pavement.

C. Limitations

Observe limitations in Article 2532.03, D.

2557.04 METHOD OF MEASUREMENT.

Square yards of Pavement Grooving, shown in contract documents

2557.05 BASIS OF PAYMENT.

Contract unit price per square yard for Pavement Grooving.

Comments:

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

Section 2557. PCC Pavement Grooving

2557.01 DESCRIPTION.

A. Use diamond grooving equipment to produce longitudinal grooves on existing PCC pavement surface

2557.02 MATERIALS.
None

2557.03 CONSTRUCTION.
A. Equipment.
1. Use equipment meeting 2532.03, A.
B. Pavement Grooving
1. Use equipment with longitudinal grooving blades 095 ± 0.05 inches wide.
2. Cut grooves meeting the following:
a. 1/8 inch ±1/16 inch wide,
b. 1/8 inch to 3/16 inch deep and,
c. uniformly spaced at ¾ inch intervals, measured center to center of groove.
3. Ensure grooves are parallel to centerline of the roadway.
4. Do not groove within 3 inches of longitudinal joint or edge of pavement.

C. Limitations
1. Observe limitations in 2532.03, D.

2557.04 METHOD OF MEASUREMENT

A. Square yards of Pavement Grooving, shown in contract documents

2557.05 BASIS OF PAYMENT
A. Contact unit price pe square yard for pavement grooving.

Reason for Revision: Section 2532 spec change requires grooving for pavement with limestone coarse aggregate. Industry prefers pavement grooving as a separate section to distinguish from the bridge deck grooving.

New Bid Item Required (X one)	**Yes X**	**No**
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X
Comments:		
County or City Comments:		
Industry Comments: Topic from CQI committee. ICPA has reviewed and gathered industry comments.		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 9**
Submittal Date: September 27, 2023	**Proposed Effective Date:** April 2024 GS	
Section No.: 4136 **Title:** Joint Fillers, Sealers and Seals	**Other:**	
Specification Committee Action: Approved as recommended.		

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4136.02, C, Preformed Elastomeric Joint Seal.

Replace the Article:

Apply ~~AASHTO M 220~~ ASTM D 2628 for pavements or ASTM D 3542 for Bridges, including requirements for lubricant adhesive. Obtain Engineer's approval for the dimensions and shape.

4136.03, D, 1.

Replace the third sentence:

For the seal and the lubricant adhesive, meet the requirements of ~~AASHTO M 220~~ ASTM D 2628 for pavements or ASTM D 3542 for Bridges.

Comments:

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

4136.01 GENERAL REQUIREMENTS.
Use the type of joint fillers and sealers required in the contract documents.

4136.02 CONTRACTION JOINT SEALERS AND SEALS.
Meet the following requirements:

A. Poured Joint Sealer.
Approved sources for poured joint sealers are listed in Materials I.M. 436.01, Appendix A.

1. Hot poured: Use sealers composed of petropolymers supplied in solid form and meeting the requirements of ASTM D 6690, Type IV.

2. Cold applied: Use sealers that meet the requirements of ASTM D 5893.

B. Backer Rod.
Approved backer rod sources are listed in Materials I.M. 436.04, Appendix A and B. If used in conjunction with joint sealers, obtain the Engineer's approval for composition. Use backer rod meeting the following requirements:

1. When used with hot poured sealers, is capable of withstanding, without damage, the high temperatures inherent to the sealers.

2. Has a maximum of 5% absorption when immersed in water for 24 hours with the ends sealed.

3. Is of a size that compression is required for installation in the joint, so that it maintains its position during the sealing operation.

4. Is dry and kept dry during installation.

5. Is inspected and accepted according to Materials I.M. 436.04.

C. Preformed Elastomeric Joint Seal.
Apply ~~AASHTO M 220~~ ASTM D 2628 for pavements / ASTM D 3542 for Bridges, including requirements for lubricant adhesive. Obtain Engineer's approval for the dimensions and shape.

4136.03 EXPANSION JOINT FILLERS AND SEALS.

Fill expansion joints with one of the following material types. When the type is not specified, use resilient filler.

A. Resilient Filler.

1. Meet requirements of AASHTO M 213.

2. Furnish in strips of dimensions shown in the contract documents.

3. When the self expanding type is specifically required, use material meeting the requirements of AASHTO M 153, Type III. Use an accompanying sealer that meets the requirements of Article 4136.02, A.

4. Approved resilient filler sources are listed in Materials I.M. 436.03, Appendix A.

5. The Engineer may approve other resilient fillers.

B. Flexible Foam Expansion Joint Filler.

1. Use the size designated in the contract documents.

2. Ensure material is resistant to petroleum derivatives.

3. Comply with the requirements of ASTM D 1752, Sections 5.1 to 5.4, with Section 5.3 modified to 10 psi minimum and 25 psi maximum when tested in accordance with AASHTO T 42.

4. Approved sources for flexible foam expansion joint fillers are listed in Materials I.M. 436.05, Appendix A.

5. Use sealer that meets the requirements of Article 4136.02, A.

C. Tire Buffings Expansion Joint Filler.

When designated in the contract documents, use tire buffings to fill expansion joints. Comply with the following:

1. Use buffings from the tire retreading industry. Approved sources for tire buffings for expansion joints are listed in Materials I.M. 436.06, Appendix A.

2. Ensure tire buffings are clean, dry, and without any contamination.

3. Place loose and strike off level.

4. Remove compacted material and replace with loose material.

5. Use sealer that meets the requirements of Article 4136.02, A. Approved sources for sealers are listed in Materials I.M. 436.01, Appendix A.

D. Elastomeric Joint Seals.

1. Use elastomeric joint seals of the size designated in the contract documents and of a shape approved by the Engineer. Approved sources for elastomeric joint seals are listed in Materials I.M. 436.02, Appendix A. For the seal and the lubricant adhesive, meet the requirements of ~~AASHTO M 220~~ ASTM 2628 for pavements / ASTM 3542 for Bridges.

2. Seals with splices will be acceptable only when splices are made using factory type methods the Engineer approves. Comply with the following:

- Do not locate splices within 1 foot of a sharp bend, when placed in final position, and
- Do not use more than one splice per finished piece.

E. Preformed, Pre-Compressed, Self-Expanding, Sealant System with Silicone Pre-Coated Surface.

1. Furnish an expansion joint system comprised of the following three components:
   a. Cellular polyurethane foam impregnated with a hydrophobic polymer and factory coated with highway-grade, low modulus, fuel resistant silicone.
   b. Field-applied epoxy adhesive.
   c. Field-applied silicone sealant edging.

2. Use an impregnation agent having proven non-migratory characteristics. The highway grade, low modulus, fuel resistant silicone facing shall be factory applied to the impregnated foam when the foam is at a width greater than the maximum working joint opening and once cured and compressed will form a bellows. The self-expanding foam sealant system shall have a depth as recommended by the manufacturer.

3. Furnish material capable of movements of +/-50% (100% total) of nominal material size.

4. Approved sources of sealant systems are listed in Materials I.M. 436.07, Appendix A.

Reason for Revision: AASHTO M 220 is Obsolete. Replaced with ASTM D 2628 for pavements and ASTM D 3542 for bridges.

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X
Comments:		
County or City Comments:		
Industry Comments:		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 10**
Submittal Date: September 27, 2023	**Proposed Effective Date:** April 2024 GS	
Article No.: 4148.01 **Title:** Drain Tiles	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4148.01, General Requirements.

Replace the first sentence:

For concrete drain tile ~~M~~meet the requirements of AASHTO M 178 or ASTM C 412, standard quality, extra quality, or special quality, as specified, or for clay drain tile meet ~~AASHTO M 179~~ ASTM C 4, standard, extra quality, or heavy duty, as specified.

Comments:

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

4148.01 GENERAL REQUIREMENTS.

For concrete drain tile ~~M~~meet the requirements of AASHTO M 178 or ASTM C 412, standard quality, extra quality, or special quality, as specified, or for clay drain tile meet ~~AASHTO M 179~~ ASTM C 4, standard, extra quality, or heavy duty, as specified. When the quality is not specified, use extra quality tile in roadway embankments, and use standard or standard quality tile in other locations.

Reason for Revision: ASTM C 412 is the ASTM call out for Concrete drain tile. ASTM M 179 is obsolete. ASTM C 4 replaced it for Clay drain tile.

New Bid Item Required (X one)	**Yes**	**No**
Bid Item Modification Required (X one)	**Yes**	**No**
Bid Item Obsoletion Required (X one)	**Yes**	**No**

Comments:

County or City Comments:

Industry Comments:

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 11**
Submittal Date: October 2023	**Proposed Effective Date:** April 2024	
Article No.: 4151.02, B **Title:** Steel Reinforcement	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4151.02, B, 1, a, Solid Dowels.

Replace the first sentence:

Use plain round or elliptical bars meeting requirements of:

4151.02, B, 3.

Replace the Article:

Furnish dowels, with the exceptions of end of run and header joints, in approved assemblies as shown in the contract documents. Use tubular and elliptical dowels in load transfer assemblies only. Ensure all dowels, including end of run and header dowels, have an epoxy coating. Ensure the coating is applied by the electrostatic spray method complying with the requirements of ~~AASHTO M 254, Type B, with a minimum coating thickness of 6 mils after cure~~ ASTM A 1078. Epoxy powders approved for use are listed in Materials I.M. 451.03B, Appendix B. Perform welding and tack welding on reinforcement according to Article 4151.06.

Comments:

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

4151.02, B. Pavement Dowel Bars.

1. Use either of the following

a. Solid dowels.

Use plain round or elliptical bars meeting requirements of:

- ASTM A 663, Grade 60 or higher,
- ASTM A 675, Grade 60 or higher, or
- ASTM A 615, Grade 40 or higher.

3. Furnish dowels, with the exceptions of end of run and header joints, in approved assemblies as shown in the contract documents. Use tubular and elliptical dowels in load transfer assemblies only. Ensure all dowels, including end of run and header dowels, have an epoxy coating. Ensure the coating is applied by the electrostatic spray method complying with the requirements of ASTM A1078 ~~AASHTO M 254, Type B, with a minimum coating thickness of 6 mils after cure~~. Epoxy powders

approved for use are listed in Materials I.M. 451.03B, Appendix B. Perform welding and tack welding on reinforcement according to Article 4151.06.		
Reason for Revision: Updates to include elliptical bars and epoxy coating requirements. M254, Type B report No. FHWA-RD-74-18 is no longer available. ASTM A1078 requires a minimum of 8 mils coating thickness and allows Type 1 (A775) for green epoxy coating Type 2 (A934) for purple epoxy coating.		
New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X
Comments:		
County or City Comments:		
Industry Comments:		

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brian Worrel	**Office:** Construction & Materials	**Item 12**
Submittal Date: Oct 12, 2023	**Proposed Effective Date:** April 2024	
Article No.: 4188.01 **Title:** Traffic Control Devices	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4188.01, B, 5, a.

Replace the Article:

Category 3 devices include temporary barriers, fixed sign supports, crash cushions, truck or trailer mounted attenuators, and other work-zone devices not meeting the definitions of Category 1 or Category 2 devices.

Comments:

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

5. **Category 3 Devices.**
   - **a.** Category 3 devices include temporary barriers, fixed sign supports, crash cushions, truck or trailer mounted attenuators, and other work-zone devices not meeting the definitions of Category 1 or Category 2 devices.
   - **b.** Category 3 devices that meet NCHRP Report 350 may be used through December 31, 2029. After December 31, 2029 use only MASH 2016 compliant Category 3 devices.

Reason for Revision: Add device to category 3 not currently listed but will become a bid item in the future if accepted. This inclusion defines what category these devices will fall under for implementation of MASH requirements in the future.

New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x

Comments:

County or City Comments:

Industry Comments:

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Daniel Harness	**Office: Design**	**Item 13**
Submittal Date: 10/23/2023	**Proposed Effective Date:** ASAP	
Article No.: **Title:**	**Other:** DS-23043, Multi-Component Liquid Pavement Markings	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 11/9/2023	**Effective Date:** 4/16/2024

Specification Committee Approved Text: See attached Developmental Specifications for Multi-Component Liquid Pavement Markings.

Comments: Effective date was changed to April to correspond to Standard Specification and Standard Road Plan revisions.

Multi-component symbols and legends will not be used for Primary and Interstate projects but could be for local systems projects. Maintenance, Construction and Materials, and Design are planning a complete rewrite of Section 2527 of the Standard Specifications that will include incorporating multi-component pavement markings so this will be addressed then. There is a bid item for multi-component symbols and legends that will stay, but needs MOM and BOP included in the plans.

Specification Section Recommended Text: See attached Draft Developmental Specifications for Multi-Component Liquid Pavement Markings.

Comments: Do we need to include multi-component liquid symbols and legends as a bid item?

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

Reason for Revision: Update.

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X

Comments:

County or City Comments:

Industry Comments:

DS-23050
(Replaces DS-23043)

DEVELOPMENTAL SPECIFICATIONS FOR MULTI-COMPONENT LIQUID PAVEMENT MARKINGS

Effective Date
April 16, 2024

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

23050.01 DESCRIPTION.

Provide reflectorized white and yellow multi-component, 100% solids multi-component liquid pavement markings that are free of toxic heavy metals for installation on asphalt and PCC pavement surfaces.

23050.02 MATERIALS.

A. General.

1. Apply multi-component liquid pavement markings in accordance with Article 2527.01 of the Standard Specifications.

2. Use materials capable of producing pavement markings with a wet-film thickness (WFT) of at least 20 mils. Apply at a greater WFT as recommended by the material manufacturer based on pavement type, pavement composition, environmental conditions, placement within a rumble, and other relevant factors. Approved products are listed in Materials I.M. 483.04, Appendix B. The Contractor may propose an equivalent product meeting all requirements of this specification, but the Engineer reserves the right to approve or deny the proposal. Multi-component Polyurea products will not be considered for usage.

3. Provide materials in accordance with the retroreflectivity requirements below.

Table 23050.02-1: Minimum Initial Retroreflectivity Requirements

Minimum Coefficient of Retroreflected Luminance	
White lines, Symbols, and Legends	400 mcd/sq. m/lux
Yellow lines	250 mcd/sq. m/lux

4. Provide yellow markings distinguishable from white markings in the dark.

5. Mix individual components before use if stored for more than 12 months.

B. Multi-Component Liquid Material.

1. Provide multi-component liquid material meeting the following requirements and

characteristics:

a. Composed only of multi-component liquids and pigments,
b. Does not emit or leach solvents into the environment upon application to a pavement surface,
c. The infrared spectrum for all components shall match the reference sample provided by the manufacturer for the product tested and approved by the Department,
d. Free of lead, cadmium, mercury, hexavalent chromium, and other toxic heavy metals as defined by the EPA,
e. White material no darker than or no yellower than 17778 of Federal Standard Number 595C Colors,
f. Daytime color of the yellow epoxy meeting the following CIE chromaticity limits using illuminant "D65/2":

Table 23050.02-2: Daytime Chromaticity Coordinates

Daytime Chromaticity Coordinates (Corner Points) - Yellow				
	1	**2**	**3**	**4**
x	0.470	0.485	0.520	0.480
y	0.440	0.460	0.450	0.420

g. White daylight directional reflectance (Y) of least 83%,
h. Yellow daylight directional reflectance (Y) of at least 50%,
i. Nighttime color of yellow meeting the following chromaticity limits in ASTM D 6628:

Table 23050.02-3: Nighttime Chromaticity Coordinates

Nighttime Chromaticity Coordinates (Corner Points) - Yellow				
	1	**2**	**3**	**4**
x	0.575	0.508	0.473	0.510
y	0.425	0.415	0.453	0.490

j. Contrast ratio of 0.98 or greater when measured on a black/white drawdown card at 15 mils WFT application rate.

2. Provide shadow lane line markings (legend ~~BLB6 or~~ BLC6) according to ~~attached modified~~ Standard Road Plans PM-110 and PM-320. Black epoxy should satisfy color chip 37038 of Federal Standard 595B and have similar quality as the white and yellow multi-component pavement markings. An anti-skid material shall be incorporated with the shadow line marking at a minimum rate of 15 pounds per gallon.

3. Adhesion Capabilities.
Provide material meeting the adhesion requirements of the ACI Committee 403 when tested on PCC. Apply multi-component ~~l~~iquid pavement markings during the test to concrete pavements with a tensile strength of at least 300 psi and ensure the failure of the system occurs in the concrete during testing.

4. Abrasion Resistance.
Provide material with an abrasion resistance wear index no greater than 82 when tested in accordance with ASTM C 501 with a CS 17 wheel under a load of 1000 g for 1000 cycles. The Department defines the wear index as the weight in milligrams of material abraded from the sample under the test conditions.

5. Hardness.
Provide material with a Type D durometer hardness from 75 to 90 when tested in accordance with ASTM D 2240 after curing for 72 hours at 73°F ±4°F.

6. **Tensile Strength.**
   For epoxy-amine based multicomponent systems, including variations of this base chemistry, provide material with a tensile strength of at least 6000 psi when tested in accordance with ASTM D 638 after curing for 72 hours at 73°F ±4°F. ~~For polyurea based multicomponent systems provide material with a tensile strength of at least 3000 psi when tested in accordance with ASTM D 638 after curing for 72 hours at 73°F ±4°F.~~

7. **Compressive Strength.**
   For epoxy-amine based multicomponent systems, including variations of this base chemistry, provide material with a compressive strength of at least 12,000 psi when tested in accordance with ASTM D 695 after curing for 72 hours at 73°F ±4°F.

C. Retroreflective Media.

1. Provide first drop wet media per the minimum rate shown for each product below. Use one of the following products for all grooved: edge lines, white broken lines, ramp edge lines, and lane drop lines:
- 3M Connected Roads All Weather Elements Series 70E or 50E: Minimum rate 5 pounds per gallon
- Potters VisiUltra 455: Minimum rate 8 pounds per gallon
- SWARCO DURALUX 334/ 334 Plus: Minimum rate 8 pounds per gallon

2. Provide second drop glass spheres with the following gradation on all lines except for black broken lane lines:

Table 23050.02-4: Utah Blend Gradation

Sieve Size	% Passing
No. 18	65-80
No. 30	30-50
No. 50	0-5

a. Glass spheres shall be dual coated.
b. Apply glass spheres at a minimum rate of 15 pounds per gallon. Application rate shall provide required minimum levels of retroreflectivity in accordance with Table 23050.02-1.

3. Provide beads packaged in moisture-proof, multi-wall shipping bags, and in containers marked with the following information:
a. Manufacturer name,
b. Manufacturer address,
c. Type of treatment,
d. Batch number, and
e. Date of manufacture.

D. Sampling and Testing.

1. Test daylight directional reflectance and color meeting the requirements of ASTM E 1349.

2. Provide 1 pint samples of each manufacturer's lot or batch of material when manufactured to an independent lab for this testing. NTPEP data may be substituted if the product has not changed from initial submittal to NTPEP for evaluation of these products.
3. Submit to the Engineer a manufacturer's Certificate of Compliance for all components of the multi-component liquid pavement marking system.

4. Mark containers with the following information:

a. Name of manufacturer,
b. Product identification number,
c. Lot or batch number,
d. Date of manufacture,
e. Color, and
f. Net weight of contents.

23050.03 CONSTRUCTION.

A. General.

1. The contract documents will specify quantity, locations, and type of pavement markings required.

2. Allowable painting dates will be from April 8th to October 22nd. Minimum pavement surface temperatures for application of pavement markings shall be 40°F and rising.

3. For all pavement markings, ensure pavement surface is dry and free from dirt, dust, oil, curing compound, and other contaminates which may interfere with markings properly bonding to the surface. Ensure the clean surface is at least 1 inch wider than anticipated marking. Shoot an air blast on the pavement surface immediately prior to placing new marking. Air blast is not intended to remove large amounts of dust, but only a very small amount of residue that might be left from removal and cleaning operation.

4. For pavement markings placed on a new asphalt surface, install any necessary temporary pavement markings, and wait a minimum of 2 weeks from the day the surface is completed before installing permanent markings.

5. Ensure the following for all painted pavement markings:
- Uniform thickness
- Uniform distribution of glass beads throughout the line width,
- Line widths as specified, with a tolerance of ± 1/2 inch for all lines,
- Markings have sharp edges and cutoffs at the ends.

B. Grooving.
Perform grooving according to Article 2527.03, H of the Standard Specifications and Standard Road Plan PM-115.
~~**1.** Perform grooving after surface corrections for pavement smoothness, shouldering, and fog sealing have been completed.~~

~~**2.** Grooved in lines shall be at a depth of 80 mils on PCC pavements and 100 mills on HMA pavements with a tolerance of ±10 mils and the width of the line plus 1 inch with a tolerance of ± 1/8 inch.~~

~~**3.** Equipment shall be capable of recessing the total width of the recess in one pass. Ensure the bottom of the groove has a fine corduroy-like texture. The maximum allowable rise between the high and low points across the width of the groove is 10 mils.~~

~~**4.** Do not place temporary pavement markings within grooves.~~

C. Traffic Control.
Apply the provisions of Section 2528 of the Standard Specifications to traffic control for removing and placing painted and taped pavement markings, along with the following additional requirements:

1. Place traffic control devices on the roadway before removal operations have commenced. Leave traffic control devices in place through the completed curing time of the newly applied pavement markings.

2. Do not close any longer length of lane than can be adequately removed and replace in a single working day.

3. For painted pavement markings, do not remove traffic control devices until the newly applied pavement markings are tack free.

D. Final Inspection
Provide an acceptable, calibrated 30 meter geometry (100 feet), retroreflectometer to use on the project which will remain the property of the Contractor. In the presence of the Engineer, measure the retroreflectivity of the pavement markings. Take a minimum of five randomly spaced readings per line type every 1 mile. The average minimum retroreflectivity per mile shall be as per table 1 from Article 23050.02, A, 3.

E. Defective Pavement Markings.

1. Markings that are low on initial retroreflectivity up to 20% may, at the discretion of the Engineer, be accepted with a price adjustment.

2. Repair, at no additional cost to the Contracting Authority, all pavement markings which, after application and curing, the Engineer determines to be defective and not in conformance with these specifications. Remove the defective markings completely and clean to the underlying pavement surface according to the requirements of Article 2527.03, C of the Standard Specifications. Remove the defective area plus all adjacent marking material extending 1 foot in any direction. After surface preparation work is complete, finish the repair by reapplying new marking material over the cleaned pavement surface according to the requirements of these specifications.

23050.04 METHOD OF MEASUREMENT.

A. Measurement for pavement markings and grooves cut, satisfactorily placed, or approved, will be as follows:

1. **Painted Pavement Markings, Multi-Component Liquid.**
Stations placed.

2. **Grooves Cut for Pavement Markings.**
Stations. This quantity will be equivalent to the number of stations measured for the pavement markings. Additional width and transition length will be incidental.

B. The Engineer will measure the number of stations, based on a single 6 inch width of line. The length of markings will be determined using beginning and ending points, and adjusting for breaks at ramps, station equations, or other locations shown in the contract documents. The measurement for dashed and dotted lines will be adjusted to exclude skips. Measurement of lines wider than 6 inches will be adjusted by the quantity factor to a 6 inch line.

23050.05 BASIS OF PAYMENT.
Painted Pavement Markings, Multi-Component Liquid and Grooves Cut for Pavement Markings will be paid for per Article 2527.05 of the Standard Specifications.