



**MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING**

September 14, 2023

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

The Specification Committee met on Thursday, September 14, 2023, at 9:00 a.m. Eric Johnsen, Specifications Engineer, opened the meeting. The items were discussed in accordance with the revised agenda dated September 11, 2023.

The minutes are as follows:

1. Article 1103.06, Execution of Contract.

The Contracts and Specifications Bureau requested to eliminate an outdated requirement.

2. Article 2301.03, U, 5, Time for Opening Pavement for Use (Portland Cement Concrete Pavement).

The Construction and Materials Bureau requested to accommodate the new IL and IT blended cements.

3. Article 2310.03, Construction (Portland Cement Concrete Overlay).

The Construction and Materials Bureau requested to reduce the time for opening PCC overlays for use.

4. Article 2317.03, B, 1, Evaluation (Primary and Interstate Pavement Smoothness).

The Construction and Materials Bureau requested to add clarification on when MRI evaluations should

not be conducted.

5. Article 2520.03, Field Laboratory And Field Office.

The Construction and Materials Bureau requested to update requirements for field laboratories and field offices.

6. Article 2527.03, H, 2, Grooving for Pavement Markings.

The Design and Maintenance Bureaus requested to update grooving requirements to align with two new Standard Road Plans.

7. Article 4186.12, Barrier Markers.

The Construction and Materials Bureau requested to clarify specifications for object markers.

8. Appendix, Table 4109.02-1: Aggregate Gradation Table.

The Construction and Materials Bureau requested to clarify that gradation no. 3 is used for pipe bedding also.

9. DS-15XXX, Portable Pop-Up Network for Inspection Use.

The Construction and Materials Bureau requested approval of Developmental Specifications for Portable Pop-Up Network for Inspection Use.

10. Section 2551, Crash Cushions.

The Construction and Materials Bureau requested to remove the bid item for Crash Cushion Spare Parts Kit.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnsen / Mark Dunn		Office: Contracts & Specifications	Item 1
Submittal Date: 8/23/2023		Proposed Effective Date: April 2024 GS	
Article No.: 1103.06 Title: Execution of Contract		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 1103.06, Execution of Contract.			
Replace the Article: The bidder to whom a contract is being awarded shall execute and file two copies of such contract with the Contracting Authority.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
Reason for Revision: Contractors electronically sign and submit contracts, so there is no longer a need for two copies.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove		Office: Construction & Materials	Item 2
Submittal Date: August 2023		Proposed Effective Date: April 2024	
Article No.: 2301.03, U, 5 Title: Time for Opening Pavement for Use (Portland Cement Concrete Pavement)		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 2301.03, U, 5.			
Replace the Article: At the Contractor's option, when Type I/II or Type IL cements are used, fly ash may be substituted for up to 10%, by weight, of the cement in Class M concrete mixtures. Type IP, and Type IS, and Type IT cements may be used in Class M concrete mixtures without fly ash substitution.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and <u>Highlight</u> .) 2301.03 U			
5. At the Contractor's option, when Type I/II or Type IL cements are used, fly ash may be substituted for up to 10%, by weight, of the cement in Class M concrete mixtures. Type IP, and Type IS, and Type IT cements may be used in Class M concrete mixtures without fly ash substitution.			
Reason for Revision: Another update to update and accommodate the new IL and IT blended cements.			
New Bid Item Required (X one)	Yes	No	
Bid Item Modification Required (X one)	Yes	No	
Bid Item Obsolescence Required (X one)	Yes	No	
Comments:			
County or City Comments:			
Industry Comments:			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Todd Hanson		Office: Construction & Materials	Item 3
Submittal Date: Aug 30, 2023		Proposed Effective Date: April 2024	
Article No.: 2310.03 Title: Construction (Portland Cement Concrete Overlay)		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 2310.03, Construction			
Add the Article:			
E. Time for Opening Pavement for Use.			
1. The time for opening pavement for use shall be in accordance with Article 2301.03, U.			
2. When the maturity method for opening is utilized, the Engineer may allow an opening strength requirement of 350 psi, for overlays 6 inches or greater.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
Add new			
E. Time for Opening Pavement for Use.			
1. The time for opening pavement for use in accordance with 2301.03.U.			
2. When the maturity method for opening is utilized, the Engineer may allow an opening strength requirement of 350 psi, for overlays six inches or greater.			
Reason for Revision: Overlays are supported on existing pavement and stress levels are lower than new pavements placed on granular materials. This spec change allows the pavement to be used by local traffic earlier.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			

County or City Comments:

Industry Comments: Industry would like change to allow local traffic on overlays sooner, especially in rural areas where access is limited. Lower required strength was found adequate on the Plymouth IA PCC overlay in 2022 research project.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove		Office: Construction and Materials	Item 4
Submittal Date: 7/6/2023		Proposed Effective Date: April 2024 GS	
Article No.: 2317.03, B, 1 Title: Evaluation (Primary and Interstate Pavement Smoothness)		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 2317.03, B, 1. Replace the first sentence: Determine an MRI using the latest version of the ProVAL “Ride Quality” or “Smoothness Assurance” analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted speed or advisory speed over 45 mph except for:			
Comments:			
Member’s Requested Change: (Do not use ‘Track Changes’, or ‘Mark-Up’. Use Strikeout and Highlight.) B. Evaluation. 1. Determine an MRI using the latest version of the ProVAL “Ride Quality” or “Smoothness Assurance” analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted speed or advisory speed over 45 mph except for:			
Reason for Revision: Desire to add clarification on when MRI evaluations should not be conducted.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove and Matt Miller		Office: Construction Materials	Item 5
Submittal Date: 8/25/23		Proposed Effective Date: ASAP	
Article No.: 2520.03 Title: Field Laboratory And Field Office.		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text:			
2520.03, A, 1, d.			
Replace the Article:			
Desk with drawers, three five chairs, a closet, and a suitable worktable space.			
2520.03, A, 1, n.			
Replace the Article:			
Provide a device to allow capable of providing wireless internet connectivity for multiple inspectors to access the internet wirelessly , such as a mobile hotspot. Provide a minimum of 40 GB of data usage monthly. Ensure consistent average data speeds of no less than 25 Mbps for downloads and 5 Mbps for uploads with an unlimited data plan. Any data throttling or speed reduction policies after reaching a certain threshold should not affect the stated speed requirements. In the event the job trailer cannot be placed in an area with the stated average speeds, placement must be approved by the Engineer. This device will be considered a part of the field laboratory and shall stay with the field laboratory. If the field laboratory and field office are located adjacent to each other, one device may be adequate to cover both, so long as the signal is strong and can be accessed from both trailers. The Contracting Authority will pay data charges for usage above the monthly minimum.			
2520.03, B, 1, h.			
Replace the Article:			
A plan table, a plan storage rack , a two office desks, three five straight chairs, a drafting stool , a water cooler dispenser, a floor broom, and a 10 pound rated capacity carbon dioxide fire extinguisher.			
2520.03, B, 1, l.			
Replace the Article:			
Wireless connectivity. Provide a device to allow capable of providing wireless internet connectivity for multiple inspectors to access the internet wirelessly , such as a mobile hotspot. Provide a minimum of 3 GB of data usage per month. Ensure consistent average data speeds of no less than 25 Mbps for downloads and 5 Mbps for uploads with an unlimited data plan.			

Any data throttling or speed reduction policies after reaching a certain threshold should not affect the stated speed requirements. In the event the job trailer cannot be placed in an area with the stated average speeds, placement must be approved by the Engineer. This device will be considered a part of the field office and shall stay with the field office. If the field laboratory and field office are located adjacent to each other, one device may be adequate to cover both, so long as the signal is strong and can be accessed from both trailers.

Comments: The Design Bureau suggested using “office desks” instead of “traditional desks”. This should avoid Contractors providing school desks or something similar.

The Construction and Materials Bureau requested making the same revisions to the wireless connectivity section of the field lab.

Specification Section Recommended Text:

2520.03, A, 1, d.

Replace the Article:

Desk with drawers, ~~three~~ five chairs, a closet, and a suitable worktable space.

2520.03, B, 1, h.

Replace the Article:

A plan table, ~~a plan storage rack~~, a two traditional desks, ~~three~~ five straight chairs, ~~a drafting steel~~, a water cooler dispenser, a floor broom, and a 10 pound rated capacity carbon dioxide fire extinguisher.

2520.03, B, 1, i.

Replace the Article:

Wireless connectivity. Provide a device ~~to allow~~ capable of providing wireless internet connectivity for multiple inspectors ~~to access the internet wirelessly~~, such as a mobile hotspot. ~~Provide a minimum of 3 GB of data usage per month.~~ Ensure consistent average data speeds of no less than 25 Mbps for downloads and 5 Mbps for uploads with an unlimited data plan. Any data throttling or speed reduction policies after reaching a certain threshold should not affect the stated speed requirements. In the event the job trailer cannot be placed in an area with the stated average speeds, placement must be approved by the Engineer. This device will be considered a part of the field office and shall stay with the field office. If the field laboratory and field office are located adjacent to each other, one device may be adequate to cover both, so long as the signal is strong and can be accessed from both trailers.

Comments: What is a “traditional desk”? What about the internet requirements for the field lab? Do those need to be changed also?

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

2520.03 FIELD LABORATORY AND FIELD OFFICE.

A. Field Laboratory.

1. General.

Meet the following requirements. Items a through h are meant as a guide rather than minimum requirements. The Engineer may approve suitable alternative facilities.

- a. Weather tight field laboratory space with minimum inside dimensions of 7 feet by 18 feet with 7

feet of head room.

- b. Two doors: one at least 32 inches wide with screens, and one for emergency.
- c. Outside walls with screened windows which can be used for ventilation.
- d. Desk with drawers, ~~three~~ five chairs, a closet, and a suitable worktable space.
- e. Splinter free and solid floor.
- f. A floor broom and fire extinguisher.
- g. Anchor bolts firmly attached to accommodate a mechanical sieve shaker (template furnished upon request).
- h. Lockable laboratory space (with appropriate number of keys) that is set level and stable for minimum vibration. The laboratory space may be independent or dependent on other space but is for the exclusive use of the Contracting Authority.
- i. Adequate lights and heavy duty, 110-volt electrical outlets, suitably placed.
- j. An exhaust fan or fans.
- k. A microwave, laboratory stove, or stoves with hoods vented to an exhaust fan.
- l. A sink with potable water supply to sink faucet.
- m. Air conditioning and heat to maintain a temperature approximately between 70°F and 80°F.
- n. Provide a device to allow multiple inspectors to access the internet wirelessly, such as a mobile hotspot. Provide a minimum of 10 GB of data usage monthly. This device will be considered a part of the field laboratory and shall stay with the field laboratory. If the field laboratory and field office are located adjacent to each other, one device may be adequate to cover both, so long as the signal can be accessed from both trailers. The Contracting Authority will pay data charges for usage above the monthly minimum.
- o. Suitable sanitary facilities located within 75 feet of the laboratory for use by the inspection forces.

2. Furnishing Field Laboratory.

A field laboratory will be required as follows:

a. Field Laboratories.

- 1) Field laboratories will be required for acceptance testing when specified on the proposal. The items for which the field laboratory is intended will be designated. If base and pavement are of similar types which require similar plant and testing facilities, only one field laboratory will be shown on the proposal for both items.
- 2) Furnish the field laboratory before all work is started. Keep the field laboratory on the project at all times regardless of work being performed or testing required. Duplicate field laboratories may be required when the plant facilities are duplicated or dispersed so that plant operation of base or pavement work cannot be monitored from one field laboratory.
- 3) Relocate laboratories used to control asphalt binder or Portland cement proportioning as the plant facilities are relocated. Field laboratories used primarily to test densities of base, subbase, or earthwork may be required to be relocated once for each 4 miles or fraction thereof in the length of the project.

b. Field Laboratories for Materials Inspection.

- 1) Materials will be inspected at the project site if prior inspection has not been made, and a materials laboratory may be required for this purpose. If inspection prior to shipment to the project site is necessary, in the opinion of the Engineer, or agreeable to the Engineer and Contractor, furnish inspection facilities near the location for inspection.
- 2) Inspection facilities will be necessary at the site of production or warehousing of:
 - Pipe,
 - Cement,
 - Asphalt,
 - Structural steel and other metal items,
 - Precast concrete,
 - Aggregates,
 - Other materials requiring or utilizing approved warehousing, and
 - Proportioning and mixing plants for concrete and bituminous mixtures at permanent facilities.
- 3) Ensure inspection facilities are suitable for the use intended, including testing space or office space for record keeping, or both. Facilities may vary from designated or separate space in a shared building for occasional inspection, to a materials laboratory (defined below) for continuous and full-time use.
- 4) Material laboratories will be required for any inspection for individual or combinations of projects involving more than:

- 5000 tons of aggregate from an individual source for use in pavement, base, or subbase, or
 - 10,000 tons of aggregate for other purposes.
- 5) Ensure laboratories are located close to production operations. For facilities furnished jointly, ensure the laboratory is within a driving distance of 5 miles from each source.
- 6) For the materials laboratory, furnish facilities similar to those specified in [Article 2520.03, A, 2, a](#). Equip the laboratory for testing the type of material to be produced according to an equipment listing available upon request. The Engineer may modify parts of this specification to allow for:
- Facilities furnished prior to first use of this specification,
 - Small amounts of material to be furnished from widely separated sources, or
 - Unusual testing procedures.

B. Field Office.

1. General.

Meet the following requirements. Items a through i are meant as a guide rather than minimum requirements. The Engineer may approve suitable alternative facilities.

- a. Office space separate and apart from any building occupied by the Contractor and for the exclusive use by the Contracting Authority.
- b. Conveniently located near the work, as may be directed by the Engineer.
- c. Weather tight, insulated, and painted, and of a size as to enclose a nominal area of 192 square feet of floor space.
- d. At least five windows having a total sash area no less than 30 square feet.
- e. Windows fitted with locking devices and hung to open and close.
- f. Outside door fitted with a cylinder lock, and all keys turned over to the Engineer.
- g. Fit the windows and door with screens.
- h. A plan table, ~~a plan storage rack, a desk, three straight chairs, a drafting stool,~~ two traditional desks, five straight chairs, a water cooler dispenser, a floor broom, and a 10-pound rated capacity carbon dioxide fire extinguisher.
- i. Non-furnished area partitioned from the larger area for use as storage.
- j. Heating and air conditioning to maintain an approximate temperature between 70°F to 80°F.
- k. No less than two wall power outlets and sufficient ceiling lighting fixtures in the office to provide a minimum of 70 foot-candles of light on all working surfaces.
- l. ~~Wireless connectivity. Provide a device to allow multiple inspectors to access the internet wirelessly, such as a mobile hotspot. Provide a minimum of 3-GB of data usage per month. This device will be considered a part of the field office and shall stay with the field office. If the field laboratory and field office are located adjacent to each other, one device may be adequate to cover both, so long as the signal can be accessed from both trailers.~~ **Wireless Connectivity:** Provide a device capable of offering wireless internet connectivity for multiple inspectors, such as a mobile hotspot. Ensure consistent average data speeds of no less than 25 Mbps for downloads and 5 Mbps for uploads. Offer an unlimited data plan. In the event the job trailer cannot be placed in an area with the stated average speeds, placement must be approved by the Engineer. Any data throttling or speed reduction policies after reaching a certain threshold should not affect the stated speed requirements. This connectivity device is deemed an integral part of the field office and shall remain therein. If the field laboratory and field office are adjacent, one device may be sufficient for both, given the signal is strong and accessible in both trailers.
- m. Suitable sanitary facilities within 75 feet of the office for the use of the inspection forces.
- n. An all-weather access road and parking area (both maintained) for not less than five vehicles at the field office for the use of the inspection forces.

Reason for Revision: Field requested higher standards for internet speeds that better match industry standards across the state, drafting table is unnecessary, more chairs are requested.

New Bid Item Required (X one)	Yes	No X
Bid Item Modification Required (X one)	Yes	No X
Bid Item Obsolescence Required (X one)	Yes	No X

Comments:

County or City Comments:
Industry Comments:

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly/Daniel Harness/Benjamin Hucker		Office: Design / Maintenance	Item 6
Submittal Date: 8/28/2023		Proposed Effective Date: April 2024 GS	
Article No.: 2527.03, H, 2 Title: Grooving for Pavement Markings		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
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 making, whichever is greater, with a tolerance of minus 0.0 inches and plus +/- 0.2 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.			
2527.03, H, 2, b, Groove depth.			
Replace the Article:			
For profiled marking tape, a A grooved depth of 0.080 inches +/- 0.010 inches applies to all pavement markings. For all other markings, If a different groove depth as is recommended by the pavement marking manufacturer, the Engineer will determine the depth.			
2527.03, H, 2, c, Groove length			
Replace the first sentence:			
Full length of tape marking plus 3 inches minimum grooving transition on either end.			
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 Minimum of 8 inch width or the marking width plus 1 inch each side of making, whichever is greater, with a tolerance of minus 0.0 inches and plus or minus 0.2 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.			

2527.03, H, 2, b, Groove depth.

Replace the article:

For profiled marking tape, a grooved depth of 0.080 inches +/- 0.010 inches applies to all pavement markings. For all other markings, if a different groove depth as is recommended by the pavement marking manufacturer, the Engineer will determine the depth.

2527.03, H, 2, c, Groove length

Replace the first sentence:

Full length of tape marking plus 3 inches minimum grooving transition on either end.

Reason for Revision: These changes will update the specifications and line them up the with two new Standard Road Plans that are being created.

New Bid Item Required (X one)	Yes	No
Bid Item Modification Required (X one)	Yes	No
Bid Item Obsolescence Required (X one)	Yes	No

Comments:

County or City Comments:

Industry Comments:

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brian Worrel	Office: Construction & Materials	Item 7
Submittal Date: June 2023	Proposed Effective Date: April 2024	
Article No.: 4186.12 Title: Barrier Markers	Other:	

Specification Committee Action: Approved as recommended.

Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
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Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4186.12, Barrier Markers.

Replace the title and Add the Article:

4186.12 BARRIER MARKERS AND OBJECT MARKERS.

C. Furnish object markers meeting the following requirements:

1. Sign panels shall meet Article 4186.02 and comply with Standard Road Plan SI-173.
2. Object markers placed on the Interstate and Primary System shall use Type XI reflective sheeting.
3. Fastening accessories, sign identification, sign posts, and finished sign inspection shall be per Section 4186.

4186.12, A.

Replace the first sentence:

Furnish barrier markers meeting the following requirements:

4186.12, B.

Replace the Article:

Approved barrier markers are listed in [Materials I.M. 486.08](#).

Comments:

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

4186.12 BARRIER MARKERS **AND OBJECT MARKERS.**

A. Furnish **barrier** markers meeting the following requirements:

1. Suitably shaped marker body designed for attachment to a flat surface.
2. Reflective surface that presents at least 7 square inches when viewed on a line parallel to the roadway center line.
3. Reflective surface of a flat acrylic plastic wide angle retroreflective lens of methyl methacrylate plastic meeting FSS LP-380C Type 1, Class C that is hermetically sealed or microprism sheeting mounted on a flat thermoplastic or PVC plastic body which is at least 70 mils thick. Microprism sheeting mounted on ASTM B 209 compliant aluminum sheeting minimum 40 mils thick is also allowed.
4. Reflective surface exhibiting a minimum specific reflectance intensity listed in Table 4186.12-1 (Utilize ASTM D 4956 Type XI Microprism sheeting on Interstate and Primary System projects.):

Table 4186.12-1: Minimum Specific Reflectance Intensity

Observation Angle Degrees	Entrance Angle Degrees	Specific Intensity Candle Power Per Foot- Candle	
		White	Yellow
0.1	0	120	75
0.1	20	50	30

B. Approved **barrier** markers are listed in [Materials I.M. 486.08](#).

C. Furnish **Object Markers** meeting the following requirements:

1. Utilize sign panels compliant to 4186.02 and standard road plan SI-173.
2. Utilize ASTM D 4956 Type XI reflective sheeting for object markers placed on the interstate and primary system.
3. Utilize fastening accessories, sign identification, sign posts and finished sign inspection compliant to 4186.

Reason for Revision: Specification 2505.03 A 5, Delineators and Object Markers pushes to specifications 4186.11 and 4186.12. 4186.12 is for barrier markers, not object markers - so this modification will help clarify what is required with object markers that are a part of guardrail installations to which they are incidental. See standard road Plan SI-173 for more info on Object markers which are actually signs. Questions have come in from the field on what is required for these, this revision will provide clarity.

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

Comments:

County or City Comments:

Industry Comments:

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Aggregate Instructors / Geology Section		Bureau: Construction & Materials		Item 8										
Submittal Date: August 14, 2023		Proposed Effective Date: April 2024 update												
Article No.: Appendix Title: Aggregate Gradation Table														
Specification Committee Action: Approved as recommended.														
Deferred:		Not Approved:		Approved Date: 9/14/2023										
				Effective Date: 4/16/2024										
Specification Committee Approved Text: See Specification Section Recommended Text.														
Comments: None.														
Specification Section Recommended Text: Appendix.														
Replace gradation 3 and note 2 of Table 4109.02-1:														
TABLE 4109.02-1: AGGREGATE GRADATION TABLE														
Grad. No.	Section No.	Std. Sieve Sz.	1 1/2"	1.00"	3/4"	1/2"	3/8"	4	8	30	50	100	200	Notes
		Intended Use	Percent Passing											
3	4115 (57, 2-8), 4118	PCC CA & Pipe Bedding	100	95-100		25-60		0-10	0-5				0-1.5	2, 10
Notes:														
2. When used in precast and prestressed concrete bridge beams, 100% shall pass the 1.00" sieve. When used for pipe bedding (4118) the No. 200 restriction does not apply.														
Comments:														
Action: Revision to Aggregate Gradation Table: Intended use Gradation 3, and Note 2 clarification. .See highlights in attached Table 4109.02-1 below.														
Reason for Revision: Revisions for clarification, no specification change														
New Bid Item Required (X one)		Yes		No x										
Bid Item Modification Required (X one)		Yes		No x										
Bid Item Obsolescence Required (X one)		Yes		No x										
Comments: Minor corrections and clarification														
County or City Comments:														
Industry Comments: N/A														

Attached:

TABLE 4109.02-1: AGGREGATE GRADATION TABLE														
Grad. No.	Section No.	Std. Sieve Sz.	1 1/2"	1.00"	3/4"	1/2"	3/8"	4	8	30	50	100	200	Notes
		Intended Use	Percent Passing											
3	4115 (57, 2-8), 4118	PCC CA & Pipe Bedding	100	95-100		25-60		0-10	0-5				0-1.5	2, 10
4	4115 (2-8)	PCC CA	100	50-100	30-100	20-75	5-55	0-10	0-5				0-1.5	10
5	4115 (67, 2-8)	PCC CA		100	90-100		20-55	0-10	0-5				0-1.5	10
6	4115.05 (Repair & Overlay)	PCC CA			100	90-100	40-90	0-30					0-1.5	10

Notes:

- When used in precast and prestressed concrete bridge beams, 100% shall pass the 1.00" sieve. When used for pipe bedding (4118) the No. 200 restriction does not apply.



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Matt Miller		Office: Construction & Materials	Item 9
Submittal Date: 7/27/2023		Proposed Effective Date: ASAP	
Article No.: Title:		Other: Developmental Specifications for Portable Pop-Up Network for Inspection Use	
Specification Committee Action: This item was deferred to a future meeting for more discussion on implementation.			
Deferred: X	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
<p>Comments: District 2 asked if the DOT wanted the Contractor to provide insurance in case a unit was lost or damaged by the Engineer or their representatives. We also need to define what happens if the Engineer or their representatives lose or damage the unit. Also, what are the data requirements? I do not see that in the specifications.</p>			
Specification Section Recommended Text: See attached draft Developmental Specifications for Portable Pop-Up Network for Inspection Use.			
<p>Comments: The District 1 Office asked who will maintain possession of the device during construction. Construction and Materials has indicated that they believe it should be the DOT maintaining possession of the device during the project. Did I miss what the data requirements are? I assume we want unlimited data with no throttling.</p>			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use <u>Strikeout</u> and <u>Highlight</u>.)			
New DS			
Reason for Revision: New Developmental Specification to add item to projects with limited cellular service. This item will ensure digital collection of project data like e-tickets by producing a 300' Wi-Fi with an amplified dual sim cellular connection for the duration of the specific project.			
New Bid Item Required (X one)	Yes X	No	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			

DRAFT DS-23XXX
(New)



**DEVELOPMENTAL SPECIFICATIONS
FOR
PORTABLE POP-UP NETWORK FOR INSPECTION USE**

Effective Date
December 19, 2023

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

23XXX.01 DESCRIPTION.

This Developmental Specification defines the minimum requirements for portable suitcase pop-up network cases to be used in highway construction sites, equipped with dual SIM 5G mobile connectivity. The network cases shall provide reliable, high-speed wireless connectivity to support construction site inspections through digital means and safety of field staff in support of digital construction technologies.

23XXX.02 MATERIALS.

- A.** Pop up network case shall include the following minimum requirements:
- Rugged case (w/CAT6 port, 12.6V input, power button).
 - DC power cord, wall charger, ethernet, & antenna cables (all pre-wired).
 - Secure connectivity for network access.
 - Mobile dual SIM provider 5G LTE connection with two Wi-Fi radios (5 GHz and 2.4 GHz).
 - 1 Gbps download speed; 150 Mbps upload speed where available.
 - 300 feet of expected Wi-Fi broadcast range.
 - Ability to configure, manage, troubleshoot remotely with cloud management software.
 - Multiple simultaneous connections.
 - Advanced threat protection and cloud-managed security controls.
 - Integrated antennas and external CAT6 port with POE.
- B.** Device shall meet or exceed the following specifications:
- **Safety Certifications:** UL/CUL, CB Scheme, EN60950-1, EN 62368
 - **Material Certifications:** WEEE, RoHS, RoHS-2, California Prop 65
 - **Case Specifications:** Weatherproofing IP64
 - **Antenna Type:** Multi-MIMO
 - **Leads:** Two Cellular, two Wi-Fi, and one GPS
 - **Cellular Type:** 4G | CBRS | LTE (617-960MHz / 1710-6000MHz)
 - **Bands:** B2 B4 B5 B12 B14 B17 B25 B26 B29 B30 B41 B66 B71 n5 n25 n41 n66 n71 B2 B4 B5 B12 B14 B17 B29 B30 B48 B66 n5 B2 B4 B5 B12 B14 B17 B29 B30 B66
 - **5G NR Bands:** n77 n78 n79 n77 n78 n79 n77 n78 n79
 - **Wi-Fi Frequency Range:** 2.4GHz to 7GHz (Concurrent)

- **Isolation 4G 5G Elements:** >10dB
- **Isolation Wi-Fi Elements:** >12db
- **Correlation Co-Efficient 4G/5G Elements:** <0.2
- **Correlation Co-Efficient Wi-Fi Elements:** <0.2
- **Nominal Impedance:** 50Ω
- **Frequency Range:** 1562MHz to 1612MHz
- **LNA Gain:** 29dB ± 2dB
- **VSWR:** <2.0:1
- **Out of Band Rejection:** >45dB (@ > +/- 100MHz f)
- **Typical Noise Figure:** <-2dB
- **Notch Filter Rejection:** @787MHz 24dB
- **Operating Voltage:** 3 to 5V DC
- **Typical Current:** 15mA
- **Antenna Housing:** High Impact UV Stable ABS Polymer
- **Connector Type:** SMA
- **Operating Temp:** -40°F to +176°F
- **Battery Specifications:**
 - FAA compliant Battery Pack (up to 10 hours life)
 - Battery Type Lithium-Ion
 - Output 12V
 - Capacity 10,000 mAh
 - Short-Circuit Protection
 - Over-Current Protection
 - Overcharging Protection
 - Discharge Protection

15095.03 CONSTRUCTION.

- A. Furnish unit to the Engineer at least 24 hours before the Contractor mobilizes on the project.
- B. If unit fails, loses functionality due to damage, or is lost, repair or replace the unit within 5 working days. If lost or damaged by the Engineer or their representative, cost to replace will be borne by the Contracting Authority.
- C. Contractor may connect to the unit, provided it doesn't significantly slow the bandwidth while the Engineer is using it.

15095.04 METHOD OF MEASUREMENT.

The Engineer will count the pop-up network devices furnished according to this specification.

15095.05 BASIS OF PAYMENT.

- A. Payment for each network case will be the contract unit price.
- B. Payment is full compensation for furnishing, delivery, and maintaining service (including cellular costs) to the pop-up network for the duration of the contract.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brian Worrel		Office: Construction & Materials	Item 10
Submittal Date: May 2023		Proposed Effective Date: April 2024	
Article No.: 2551 Title: Crash Cushions		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 9/14/2023	Effective Date: 4/16/2024
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text:			
2551.02, Materials.			
<p>Replace Article C and delete Article D:</p> <p>C. For permanent crash cushions and spare parts kits, use equipment and materials of new stock, unless the contract documents provide for the relocation or the use of fixtures furnished by others.</p> <p>D. Refer to Materials I.M. 455, Appendix A, for parts to be included in spare parts kits. Spare parts kits are to be supplied by the crash cushion manufacturer and contain materials designated for repairing the specific brand and model of crash cushion furnished.</p>			
2551.04, Method of Measurement.			
<p>Delete Article C and renumber Article D:</p> <p>C. Crash Cushion Spare Parts Kits. By count for crash cushion spare parts kits delivered to the local maintenance office.</p> <p>D C.Backup structures, paved footings, and additional connection hardware. Not measured separately for payment.</p>			
2551.05, Basis of Payment.			
<p>Delete Article C and renumber Article D:</p> <p>C. Crash Cushion Spare Parts Kits. Each.</p> <p>D C.Backup structures, paved footings, and additional connection hardware. Incidental to crash cushions.</p>			
Comments:			

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

Section 2551. Crash Cushions

2551.01 GENERAL.

- A. Furnish and install crash cushions accepted as crashworthy devices by the FHWA and meeting the requirements of NCHRP Report 350, Test Level 3 criteria or AASHTO MASH criteria for any crash cushion evaluated after January 1, 2011. Approved products are listed in [Materials I.M. 455, Appendix A](#). All products listed in [Materials I.M. 455, Appendix A](#), are acceptable for use as temporary crash cushions.
- B. When a permanent, redirective, or severe-use crash cushion is required by the contract documents, install one of the crash cushions specifically designated for such use in [Materials I.M. 455, Appendix A](#).
- C. In case of a discrepancy between these specifications and the manufacturer's recommendations, these specifications govern.

2551.02 MATERIALS.

- A. Meet the manufacturer's requirements.
- B. Ensure crash cushions are in good repair when installed.
- C. For permanent crash cushions ~~and spare parts kits~~, use equipment and materials of new stock, unless the contract documents provide for the relocation or the use of fixtures furnished by others.
- ~~D. Refer to [Materials I.M. 455, Appendix A](#), for parts to be included in spare parts kits. Spare parts kits are to be supplied by the crash cushion manufacturer and contain materials designated for repairing the specific brand and model of crash cushion furnished.~~

2551.03 CONSTRUCTION.

A. General.

- 1. Install crash cushions according to the manufacturer's recommendations. Prior to installation, provide the Engineer with:
 - Three copies of the manufacturer's most current product manuals covering installation and maintenance of the unit.
 - Required certification statements.
 - Additional hardware, tools, or documentation supplied by the manufacturer.
- 2. The manufacturer may require the use of additional connection hardware, construction of a backup structure, or construction of a paved footing for a specific installation. When required, construct and attach these items to the obstacle, the crash cushion, or both, in a manner specified by the manufacturer.
- 3. Complete grading work, if required, prior to installation of crash cushions.
- 4. When a roadway is closed to public traffic for construction, install all crash cushions prior to opening the road to traffic.
- 5. Do not allow attachments to new concrete or to anchor bolts set in epoxy resin to be stressed until the new concrete or epoxy resin has attained an age of 3 calendar days. This time requirement may be lengthened by the Engineer during cool weather.

B. Temporary Crash Cushions.

- 1. Unless shown otherwise in the contract documents, apply a retroreflective panel as described for permanent crash cushions.

2. When damaged, repair or replace the crash cushion. Initiate service to a damaged crash cushion within one hour of notification. Do not allow the object being shielded to be exposed to traffic for more than 12 hours.
3. When a temporary crash cushion is no longer required, remove it. The crash cushion becomes the property of the Contractor. Remove anchor bolts, if used, and fill the bolt holes with one of the non-shrink grouts listed in [Materials I.M. 491.13, Appendix A](#).
4. When a crash cushion is required after the final stage of a project, leave it in place. The crash cushion becomes the property of the Contracting Authority.

C. Permanent Crash Cushions.

1. Mark the approach end of the crash cushion with a rectangular panel consisting of materials approved by the manufacturer and install according to the manufacturer's recommendations. Cover the panel with alternating black and retroreflective yellow stripes that meet the following:
 - Minimum of 3 inches in width,
 - Slope down at an angle of 45 degrees toward the side on which traffic is to pass the crash cushion.
 - Form chevrons that point upwards if traffic can pass to either side of the crash cushion.
 - Retroreflectivity requirements for Type IV reflective sheeting (yellow stripes only).
2. Crash cushions with a flat face, the panel is to cover the entire face of the crash cushion.
3. Crash cushions with a rounded face, the panel is to cover the entire height and width of that portion of the face between the sides of the crash cushion. However, the panel need not cover that portion of the face within 12 inches of the ground or higher than 42 inches.
4. Permanent crash cushions become the property of the Contracting Authority.

2551.04 METHOD OF MEASUREMENT.

Measurement will be as follows:

A. Temporary Crash Cushions.

By count.

B. Permanent Crash Cushions.

By count.

~~C. Crash Cushion Spare Parts Kits.~~

~~By count for crash cushion spare parts kits delivered to the local maintenance office.~~

~~DC. Backup structures, paved footings, and additional connection hardware.~~

~~Not measured separately for payment.~~

2551.05 BASIS OF PAYMENT.

Payment will be contract unit price as follows:

A. Temporary Crash Cushions.

1. Installed: each.
2. Repaired or replaced due to damage by public traffic: extra work according to [Article 1109.03, B](#).

B. Permanent Crash Cushions.

Each.

~~C. Crash Cushion Spare Parts Kit.~~

~~Each.~~

~~DC. Backup structures, paved footings, and additional connection hardware.~~

Incidental to crash cushions.		
<p>Reason for Revision: There is no reliable method for determining what each products spare parts kit should contain – some manufacturers indicate the spare parts need is determined by the damage the crash cushion receives and will not define a kit for our use to fill the departments document for spare parts kits. This in turn creates a bidding disadvantage to manufacturers that have a spare parts kit as they have to supply this hardware while others do not. Due to this the list this specification points to for spare parts kits (IM 455 Appendix A additional info tab in MAPLE) is very outdated and does not function as originally intended. Removal of the bid item for spare parts kit will be needed.</p>		
New Bid Item Required (X one)	Yes	No x
Bid Item Modification Required (X one)	Yes	No x
Bid Item Obsolescence Required (X one)	Yes x	No
Comments:		
County or City Comments:		
Industry Comments:		