IOWA DEPARTMENT OF TRANSPORTATION

To Office:	Specification Committee	**Date:**	August 4, 2014
Attention:		**Ref. No.:**	305
From:	Thomas L. Reis, P.E.		
Office:	Specifications		
Subject:	Agenda for August 14, 2014, Specification Committee Meeting		

The Specification Committee will meet on Thursday, August 14, 2014, at 9:00 a.m. in the NW Wing 1st Floor Conference Room.

The agenda is as follows:

1. Article 1105.04, A, Conformity With And Coordination Of The Contract Documents.

The Office of Contracts requests to clarify the hierarchy of the Notice to Bidders with other contract documents in the event of inconsistencies.

2. Article 1109.01, B, 1, a, Reinforced Concrete Box (RCB) Culvert (Measurement and Payment and Metric Conversion).

The Office of Bridges and Structures requests to eliminate references to metric RCB standards that have been obsoleted with implementation of LRFD.

3. Section 2303, Flexible Pavement.

The Office of Construction and Materials requests to make a couple of revisions to the flexible pavement specifications.

4. Article 2320.02, F, 1, Composition and Quality of Mixture (Polymer-Modified Microsurfacing).

The Office of Construction and Materials requests to make review and approval of polymer-modified microsurfacing mixtures a District responsibility.

5. Article 2402.04, B, 3, Excavation for Structures.

The Office of Design requests to change the excavation width requirements for culverts.

6. Article 2551.01, A, General (Crash Cushions).

The Office of Design requests to add AASHTO MASH criteria for crash cushions.

7. Article 4186.02, A, 2, Sign Panels.

The Office of Construction and Materials requests to make revisions per ATSSA recommendation.

8. DS-12052, Partial Depth PCC Finish Patches.

The Office of Design revisions to the Developmental Specifications for Partial Depth PCC Finish Patches.

9. SS-12XXX, Asphalt Binder.

The Office of Construction and Materials requests approval of Supplemental Specifications for Asphalt Binder.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Ed Kasper	**Office:** Contracts	**Item 1**
Submittal Date: June 11, 2014	**Proposed Effective Date:** April 2015 GS	
Article No.: 1105.04, A **Title:** Conformity With And Coordination Of The Contract Documents	**Other:**	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**
Specification Committee Approved Text:			
Comments:			

Specification Section Recommended Text:

1105.04, A.

Add the Article:

11. Notice to bidders

Comments:

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

1105.04 CONFORMITY WITH AND COORDINATION OF THE CONTRACT DOCUMENTS.

A. In case of a discrepancy between contents of the contract documents, the following items listed by descending order shall prevail:

1. Addendum

2. Proposal Form

3. Special Provision

4. Plans

5. Standard Bridge Plans, Standard Culvert Plans, and Standard Road Plans

6. Developmental Specifications

7. Supplemental Specifications

8. General Supplemental Specifications

9. Standard Specifications

10. Materials I.M.

11. Notice to bidders

Reason for Revision: The Notice to Bidders is the legal advertisement of the letting published in the Des Moines Register, and is also posted online. It provides instructions on the submission of bids and other requirements, and is often overlooked as a component to the contract documents.

This revision will clarify the hierarchy of the Notice to Bidders with other contract documents in the event of inconsistencies.

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:

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Gary Novey	**Office:** Bridges and Structures	**Item 2**
Submittal Date: July 29, 2014	**Proposed Effective Date:** April 2015	
Article No.: 1109.01, B, 1, a **Title:** Measurement and Payment and Metric Conversion	**Other:**	

Specification Committee Action:

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

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

1109.01, B, 1, a, Reinforced Concrete Box (RCB) Culvert.

Delete the Article:

~~**a. Reinforced Concrete Box (RCB) Culvert.**~~

~~**1)** The Contractor, as an option, may construct a comparable size single or twin box culvert in metric units using the MRCB-G1-95 or MTWRCB-G1-95 culvert standards in lieu of the English culvert standards specified on the letting plans. Exceptions/substitutions on special designs that are not covered by the MRCB-G1-95 or MTWRCB-G1-95 standards will not be allowed.~~

~~**2)** After being awarded the contract, if the Contractor intends to exercise this option, the Contractor shall submit to the Engineer an amended copy of the letting plan showing the alternate units for all the appropriate dimensions. These shall include the fill height, the culvert span and rise, all longitudinal (along the culvert) dimensions and a list of the MRCB-G1-95 or MTWRCB-G1-95 culvert standard sheets required to build the RCB, including headwall sheets and bell joint sheets if required.~~

~~**3)** A list of comparable metric culvert opening sizes that can be constructed in lieu of a specified English culvert opening is as follows:~~

~~**Table 1109.01-5: Comparable Metric Culvert Opening Sizes**~~

~~English (feet)~~	~~Comparable Metric (millimeters)~~	~~English (feet)~~	~~Comparable Metric (millimeters)~~
~~3 x 3~~	~~900 x 900~~	~~8 x 6~~	~~2400 x 1800~~
~~4 x 4~~	~~1200 x 1200~~	~~8 x 10~~	~~2400 x 3000~~
~~5 x 3~~	~~1500 x 900~~	~~10 x 4~~	~~3000 x 1200~~
~~5 x 4~~	~~1500 x 1200~~	~~10 x 5~~	~~3000 x 1500~~
~~5 x 5~~	~~1500 x 1500~~	~~10 x 6~~	~~3000 x 1800~~
~~5 x 6~~	~~1500 x 1800~~	~~10 x 8~~	~~3000 x 2400~~
~~6 x 3~~	~~1800 x 900~~	~~10 x 10~~	~~3000 x 3000~~
~~6 x 4~~	~~1800 x 1200~~	~~10 x 12~~	~~3000 x 3600~~
~~6 x 5~~	~~1800 x 1500~~	~~12 x 6~~	~~3600 x 1800~~
~~6 x 6~~	~~1800 x 1800~~	~~12 x 8~~	~~3600 x 2400~~
~~6 x 8~~	~~1800 x 2400~~	~~12 x 10~~	~~3600 x 3000~~
~~8 x 4~~	~~2400 x 1200~~	~~12 x 12~~	~~3600 x 3600~~
~~8 x 5~~	~~2400 x 1500~~		

Comments:

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

1. **Exceptions.**
The Engineer may approve exceptions to construction based on plan dimensions, on a project-by-project basis, provided the request does not adversely affect the intended design. Exceptions shall be at no additional cost to the Contracting Authority.

~~**a. Reinforced Concrete Box (RCB) Culvert.**~~

~~**1)** The Contractor, as an option, may construct a comparable size single or twin box culvert in~~

~~metric units using the MRCB-G1-95 or MTWRCB-G1-95 culvert standards in lieu of the English culvert standards specified on the letting plans. Exceptions/substitutions on special designs that are not covered by the MRCB-G1-95 or MTWRCB-G1-95 standards will not be allowed.~~

~~**2)** After being awarded the contract, if the Contractor intends to exercise this option, the Contractor shall submit to the Engineer an amended copy of the letting plan showing the alternate units for all the appropriate dimensions. These shall include the fill height, the culvert span and rise, all longitudinal (along the culvert) dimensions and a list of the MRCB-G1-95 or MTWRCB-G1-95 culvert standard sheets required to build the RCB, including headwall sheets and bell joint sheets if required.~~

~~**3)** A list of comparable metric culvert opening sizes that can be constructed in lieu of a specified English culvert opening is as follows:~~

~~Table 1109.01-5: Comparable Metric Culvert Opening Sizes~~

~~English (feet)~~	~~Comparable Metric (millimeters)~~	~~English (feet)~~	~~Comparable Metric (millimeters)~~
~~3 x 3~~	~~900 x 900~~	~~8 x 6~~	~~2400 x 1800~~
~~4 x 4~~	~~1200 x 1200~~	~~8 x 10~~	~~2400 x 3000~~
~~5 x 3~~	~~1500 x 900~~	~~10 x 4~~	~~3000 x 1200~~
~~5 x 4~~	~~1500 x 1200~~	~~10 x 5~~	~~3000 x 1500~~
~~5 x 5~~	~~1500 x 1500~~	~~10 x 6~~	~~3000 x 1800~~
~~5 x 6~~	~~1500 x 1800~~	~~10 x 8~~	~~3000 x 2400~~
~~6 x 3~~	~~1800 x 900~~	~~10 x 10~~	~~3000 x 3000~~
~~6 x 4~~	~~1800 x 1200~~	~~10 x 12~~	~~3000 x 3600~~
~~6 x 5~~	~~1800 x 1500~~	~~12 x 6~~	~~3600 x 1800~~
~~6 x 6~~	~~1800 x 1800~~	~~12 x 8~~	~~3600 x 2400~~
~~6 x 8~~	~~1800 x 2400~~	~~12 x 10~~	~~3600 x 3000~~
~~8 x 4~~	~~2400 x 1200~~	~~12 x 12~~	~~3600 x 3600~~
~~8 x 5~~	~~2400 x 1500~~		

~~b.~~ a. Construction Materials.

1) The following exceptions in Division 41, Construction Materials are approved, and will be allowed:

a) Section 4151, Steel Reinforcement.

All English Reinforcing steel may be substituted with metric reinforcing steel as follows:

Table 1109.01-6: Metric Reinforcing Steel

English	Hard Converted* Metric Size	Soft Converted* Metric Size
4	15	13
5	15	16
6	20	19
7	25	22
8	25	25
9	30	29
10	35	32
11	35	36

* Hard Converted metric size reinforcing steel refers to bars referenced in ASTM A 615/A 615 M - 95b using the following sizes: 10, 15, 20, 25, 30, 35, 45, and 55. Soft Converted metric size reinforcing steel refers to bars referenced in ASTM A 615/A 615 M - 96a using the following sizes: 10, 13, 16, 19, 22, 25, 29, 32, 36, 43, and 57.

Reason for Revision: The reinforced concrete box culvert standards have been updated to the new LRFD specifications. At the time of the revision the bridge office decided not to update the metric version of these standards. Any request for building a metric reinforced concrete box culvert in lieu of an English reinforced concrete box culvert will be handled on a case by case basis.

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: Metric concrete box culvert standards have already been made obsolete.		
County or City Comments:		
Industry Comments:		

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Schott Schram	**Office:** Construction and Materials	**Item 3**
Submittal Date: 7/28/2014	**Proposed Effective Date:** April 2014	
Section No.: 2303 **Title:** Flexible Pavement	**Other:**	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

2303.02, E, 2, d.

Replace the Article:

Use the following minimum stripping inflection point (SIP) requirements for plant produced material:

PG High Temperature, °C	SIP, Number of Passes[1,2]	
	< 3,000,000 ESALS	≥ 3,000,000 ESALS
58	10,000	14,000
64	10,000	14,000
70	10,000	14,000

Note 1: If the ratio between the creep slope and the stripping slope as defined in Materials I.M. 319 is less than 2.00, the SIP is invalid.

Note 2: Minimum SIP for mixtures placed as base widening is 5000 passes.

When notified of non-compliant results, the Engineer may suspend paving operations until an approved "significant mix change" is implemented.

2303.05, A, 3, a, 2.

Replace the Article:

Payment when ~~AAD is used for acceptance~~ PWL lots are incomplete:

AAD from Target Air Void	**Pay Factor**
0.0 to 1.0	1.000
1.1 to 1.5	0.900
1.6 to 2.0	0.750
Over 2.0	0.500 maximum

When the AAD is more than 2.0, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

Comments:

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

2303.02, E, 2, d

d. Use the following minimum stripping inflection point (SIP) requirements for plant produced material:

PG High Temperature, °C	SIP, Number of Passes[1,2]	
	< 3,000,000 ESALS	≥ 3,000,000 ESALS

58	10,000	14,000
64	10,000	14,000
70	10,000	14,000

[1]If the ratio between the creep slope and the stripping slope as defined in Appendix A of this Specification is less than 2.00, the SIP is invalid..

[2]The minimum SIP for mixtures placed as base widening is 5,000 passes.

When notified of non-compliant results, the Engineer may suspend paving operations until an approved "significant mix change" is implemented.

- **2303.05, A, 3, a, 2**

Payment when PWL lots are incomplete ~~AAD is used for acceptance~~:

Reason for Revisions:

- The SIP limits are not appropriate for base widening mixtures that may use as little as 45% crushed material.
- The payment schedule for AAD lots (incomplete PWL lots) is being confused with Moving AAD lots, which always have a PF=1.0.

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: Industry is in support of the changes.

County or City Comments:

Industry Comments:

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Scott Schram	**Office:** Construction and Materials	**Item 4**
Submittal Date: 7/28/2014	**Proposed Effective Date:** April 2014	
Article No.: 2320.02, F, 1 **Title:** Composition and Quality of Mixture (Polymer-Modified Microsurfacing)	**Other:**	

Specification Committee Action:

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

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

2320.02, F, 1.

Replace the third bullet:

Submit the proposed mix design to the ~~Materials Bituminous Engineer in the Central Laboratory~~ District Materials Engineer for approval ~~with a copy to the District Materials Engineer~~. The ~~Central Laboratory~~ District will review the mix design within 14 calendar days. Use DOT MICROMIX spreadsheet when submitting designs.

Comments:

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

2320.02, F, 1

Submit the proposed mix design to the District Materials Engineer ~~Materials Bituminous Engineer in the Central Laboratory~~ for approval ~~with a copy to the District Materials Engineer~~. The District ~~Central Laboratory~~ will review the mix design within 14 calendar days. Use the DOT MICROMIX spreadsheet when submitting designs.

Reason for Revisions: As microsurfacing becomes more prevalent as a preservation treatment, the review and approvals is being transferred to the districts. Designs are already being submitted to the districts. This change will reflect the current practice of applying the approvals.

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:

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith	**Office:** Design	**Item 5**
Submittal Date: 2014.06.24	**Proposed Effective Date:** 4/21/2015	
Article No.: 2402.04, B, 3 **Title:** Excavation for Structures	**Other:**	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

2402.04, B, 3.

Replace the first sentence:

For roadway pipe culverts, the amount of excavation measured for payment will be computed from an excavation centered on the center line of the pipe, to the required depth, length, and a width of ~~42 inches~~ 4 feet (1.2 m) plus the specified inside diameter of the pipe in inches (millimeters).

2402.04. B, 4.

Replace the first sentence:

For cast-in-place culverts, the amount of excavation measured for payment will be computed from an excavation centered on the center line of the culvert, to the required depth, length, and a width ~~2~~ 4 feet (~~0.6~~ 1.2 m) greater than the inside width of the ~~footing~~ culvert.

2402.04, B, 5.

Delete the Article:

~~**5.** When moisture control is required by the contract documents, the amount of excavation measured for payment will be computed for an excavation to the required depth and length and a width extending 6 feet (2 m) beyond the limits of the structure.~~

Comments:

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

2402.04, B, 3.

Replace the first sentence:

For roadway pipe culverts, the amount of excavation measured for payment will be computed from an excavation centered on the center line of the pipe, to the required depth, length, and a width of ~~42 inches~~ 4 feet (1.2 m) plus the specified inside diameter of the pipe in inches (millimeters).

2402.04. B, 4.

Replace the first sentence:

For cast-in-place culverts, the amount of excavation measured for payment will be computed from an excavation centered on the center line of the culvert, to the required depth, length, and a width ~~2~~ 4 feet (~~0.6~~ 1.2 m) greater than the inside width of the ~~footing~~ culvert.

2402.04, B, 5.

Delete the Article:

~~When moisture control is required by the contract documents, the amount of excavation~~

~~measured for payment will be computed for an excavation to the required depth and length and a width extending 6 feet (2 m) beyond the limits of the structure.~~		
Reason for Revision: Members of the Offices of Design, and Construction and Materials met to discuss questions regarding filling out Tab 104-4. In the meeting, the members realized Standard Road Plans RF-30A, RF-30D, and the Specifications need to be coordinated. The members decided for the sake of consistency, trench width should be determined by adding 4 feet to the inside dimension of the structure. They also determined the 6 foot dimension associated with moisture control is no longer needed since flooded backfill is used up to a height of 5 feet for box culverts. With the 1:1 slope of the trench, the width of the trench at the top of the flooded backfill extends 6 feet beyond the outside of the structure.		
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:		

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith	**Office:** Design	**Item 6**
Submittal Date: 2014.06.23	**Proposed Effective Date:** 4/21/2015	
Article No.: 2551.01, A **Title:** General (Crash Cushions)	**Other:**	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**
Specification Committee Approved Text:			
Comments:			

Specification Section Recommended Text:

2551.01, A.

Replace the first sentence:

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.

Comments:

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

2551.01, General.

Replace the first sentence:

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.

Reason for Revision: Systems evaluated after January 1, 2011 must meet AASHTO MASH criteria to receive FHWA approval.

New Bid Item Required (X one)	**Yes**	**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:

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder	**Office:** Construction & Materials	**Item 7**
Submittal Date: July 2, 2014	**Proposed Effective Date:** April 2014 GS	
Article No.: 4186.02, A, 2 **Title:** Sign Panels	**Other:**	

Specification Committee Action:

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

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

4186.02, A, 2.

Replace the second sentence:

A non chromate conversion coating conforming to ASTM B 921 may be applied to the aluminum according to the sheeting manufacturer's recommendations.

Comments:

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

4186.02 SIGN PANELS.

Fabricate sign panels from sheet aluminum, galvanized steel, or when specified, plywood or flexible roll-up material.

A. Sheet Aluminum.

1. Meet the following requirements:

a. Aluminum for Type A signs complies with ASTM B 209, Alloy 5052-H38.

b. If the aluminum thickness is not specified in the contract documents, then the thickness is 0.080 inches (2 mm) for signs with the longest side of 36 inches (900 mm) or less, and 0.125 inches (3 mm) for signs with the longest side greater than 36 inches (900 mm). These thicknesses are subject to similar tolerances as specified in ASTM B 209 for a sheet having a width equal to the greatest dimension of the sign.

2. Before application of sheeting, degrease and etch the aluminum surface according to the sheeting manufacturer's recommendations. A non chromate conversion coating conforming to ASTM B 921 may be applied to the aluminum according to the sheeting manufacturer's recommendations. Remove all white rust present on the aluminum prior to application of the sheeting according to the sheeting manufacturer's recommendations.

Reason for Revision: As per ATSSA recommendation.

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:

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith	**Office:** Design	**Item 8**
Submittal Date: 7/21/2014	**Proposed Effective Date:** 10/21/2014	
Article No.: **Title:**	**Other:** Developmental Specifications for Partial Depth PCC Finish Patches	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text:			
Comments:			

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

Reason for Revision:

- Clarify in Article 2530.03, B, 2, minimum patch with is 12 inches for all patches.
- Renumber the Modified Standard Road Plan as PR-107. Effective with the October 2014 letting, the RR series of Standard Road Plans is being renumbered as the PR series.

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:		

DS-120XX
(Replaces DS-12052)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
PARTIAL DEPTH PCC FINISH PATCHES

Effective Date
May 20, 2014

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

This specification replaces Section 2530 of the Standard Specifications for Partial Depth Portland Cement Concrete Patches.

2530.01 DESCRIPTION.

A. This specification contains requirements for Partial Depth PCC Patches, Partial Depth PCC Joint and Crack Repair Patches, and Overdepth Patches.

B. Remove pavement in areas designated in the contract documents. This includes furnishing and placing patching material to provide a new traffic surface, and restoring adjacent shoulder as shown in the contract documents. This work is in areas where the size, shape, and depth of patch depends on extent of pavement deterioration and shall be determined during removal operation.

C. Patches may be identified and constructed as one of the following types:

1. Finish Patches.
Finish patches are square or rectangular in shape. They will be less than 6 feet (2 m) in length when placed on a longitudinal or transverse joint or random crack. Patches will be identified by tabulation in the contract documents. The patch size and location for each lane will be shown. Patch size and locations may be adjusted by the Engineer to fit field conditions.

2. Joint and Crack Repair Patches.
Joint and crack repairs are square or rectangular in shape. They will be placed at a longitudinal or transverse joint or random crack. They will be a minimum of 6 feet (2 m) in length, and will be identified by tabulation in the contract documents. Size and location will be shown. Repair size and location may be adjusted to fit field conditions.

3. Overdepth Patches
Overdepth Patches are irregular in shape. They are placed to the full depth of existing pavement in areas of unsound concrete as designated by the Engineer. Repair size and location will be determined at time of construction.

2530.02 MATERIALS.
Meet the requirements for the type of material specified.

A. PCC Patching Material.
Meet one of the requirements below. When patching encroaches on an adjacent lane open to traffic or when there is patching on two lane pavements or other locations where overnight closures are not

permitted, use Class A or Class B patching material. Pavements with three or more lanes and when overnight closure is permitted, use Class C patching material.

1. Class A Patching Material.

a. Use a modified Portland cement type manufactured to provide rapid set and high early strength. Meet requirements of Materials I.M. 491.20.

b. When a mortar is furnished, add the manufacturer's recommended quantity of coarse aggregate. Use pea gravel, minimum Class 2 durability, meeting requirements of Section 4112.

2. Class B Patching Material.

Use high early strength rapid set (5 hour) concrete meeting requirements of Materials I.M. 529 and the following requirements:

- Use Class M mixture patching material with calcium chloride. Class M mixtures with calcium chloride shall not contain fly ash.
- Place concrete within 30 minutes after introduction of calcium chloride.
- For coarse aggregate, use crushed carbonate stone chips or pea gravel, minimum Class 2 durability, meeting requirements of Section 4112.

3. Class C Patching Material.

Use mixture with an early set that will allow time of opening to traffic in 24 to 36 hours as directed by the Engineer. For coarse aggregate, meet requirements for Class B patching material. Use Class M mixture meeting requirements of Materials I.M. 529 without addition of calcium chloride.

4. Modifications to Mixtures for Class B and Class C Patching Material.

Apply the following modifications to mixtures for Class B and Class C patching material:

a. Slump.

1) Slump, measured according to Materials I.M. 317 prior to addition of calcium chloride solution, shall be between 1 and 2.5 inches (25 and 65 mm) as a target range, allowing a maximum of 3 inches (75 mm). If calcium chloride solution is not to be added, slump shall be between 1 and 3 inches (25 and 75 mm) as a target range, allowing a maximum of 4 inches (100 mm).

2) When a Type A Mid Range water reducing admixture is used, the slump, tested prior to the addition of calcium chloride, shall be between 1 and 4 inches (25 and 100 mm) as a target range, allowing a maximum of 5 inches (125 mm).

b. Air Entrainment.

Entrained air content of unconsolidated concrete will be determined according to Materials I.M. 318, prior to addition of calcium chloride if it is to be added. When calcium chloride is to be added, air entrainment shall be 5.0%, with a tolerance of ± 2.0%. When calcium chloride is not to be added, air entrainment shall be 6.5%, with a tolerance of ± 1.5%.

c. Temperature.

Temperature of Class B patching material, as delivered to job site, shall be as required in Article 2530.02, B, 4, d. Ensure temperature of Class C patching material, as delivered to the job site, is greater than 65°F (18°C). Heating water, aggregate, or both, may be necessary. Cost of heating is incidental to patching.

d. Cement.

1) For Class M concrete mixtures, meet requirements of Section 4101.

2) Refer to Table 2530.02-1 for cement types and maximum allowable substitution rates. Maximum substitution for Type IS shall not exceed 25%.

Table 2530.02-1: Cement Types and Maximum Allowable Substitution Rates

Patch Class	Cement Type	Maximum Allowable Substitution	Minimum Mix Temperature
B	**a.** Type I, Type II **b.** Type IS	**c.** 0% Fly Ash **d.** 0% Fly Ash	**e.** 75ºF (24ºC) **f.** 80ºF (27ºC)*
C	**g.** Type I, Type II **h.** Type IS	**i.** 10% Fly Ash **j.** 0% Fly Ash	**k.** 65ºF (18ºC) **l.** 70ºF (21ºC)*
1. * When Type A Mid Range water reducing admixture is used, limit the minimum mix temperature to that required when Type I/II cement is used.			

e. Calcium Chloride.

1) Where calcium chloride is required, furnish it in water solution form and add it to the mix at job site. Use a commercial 32% calcium chloride solution, or equivalent, prepared according to Table 2530.02-2:

Table 2530.02-2: Proportions for 32% Calcium Chloride Solutions

Type of Solid Calcium Chloride	Pounds (Grams) of Solid per Gallon (liter) of Water	Solution Produced per Gallon (liter) of Water
Type 1 – Regular Flake (77% material)	**m.** 6 (720)	**n.** 1.3
Type 2 – Concrete Flake or Pellets (94% material)	**o.** 4.5 (540)	**p.** 1.2

2) Engineer will check solution concentration using a hydrometer according to Materials I.M. 373. Add solution at the rate of 3.0 gallons per cubic yard (14.8 L/m^3) of concrete. Calcium chloride solutions of different concentrations may be approved by the Engineer, provided appropriate adjustments in the total concrete composition are made.

3) Agitate mixture until calcium chloride is completely in solution, and continue agitation as necessary to maintain uniformity.

4) Except when using continuous mixing equipment described in Article 2001.20, E, ensure calcium chloride solution is present in mix for at least 2 minutes of mixing.

f. Water Reducer.

Type A Mid Range water reducing admixture may be used. Use one listed in Materials I.M. 403, at manufacturer's recommended dosage.

g. Transit Mix Concrete.

Use mix from a plant which can be delivered and placed within 60 minutes from start of mixing. Time may be extended to 90 minutes when a retarding admixture, used according to Materials I.M. 403 including temperature dosage guidelines (and at no additional cost to Contracting Authority), is added at the plant. Continuous mixing equipment using volumetric proportioning may be used according to Article 2001.20, E.

h. Prepackaged Mixture.

A prepackaged mixture, proportioned as specified above for Class B or Class C matching material, may be furnished as a Class B or Class C patching material with the Engineer's approval. Coarse aggregate for prepackaged mixtures shall meet the requirements of Article 4115.05. Mix prepackaged mixtures in an on-site paddle type mixer; or proportion and mix with continuous mixing equipment using volumetric proportioning according to Article 2001.20, E.

B. Joint Boards.

Comply with the following:

1. Joint boards for recreating joints and cracks: use a resilient filler, cellulosic fiber, paraffin coated cardboard, or other nonabsorbent, compressible material of proper shape to recreate joint during placement of patch material.

2. Boards for recreating transverse joints: one piece. One piece boards will not be required in lengths exceeding 6 feet (1.8 m).

3. Boards for recreating longitudinal joints: one piece. One piece boards will not be required in lengths exceeding 6 feet (1.8 m).

4. Joints and open transverse cracks: use a board with a nominal width of 0.25 inch (5 mm). Metal strips may be used for narrow cracks.

5. Extend boards and metal strips into the pavement to bottom of patch; no horizontal joints permitted.

6. Use of a bond breaker on board surfaces is encouraged.

C. Joint Sealer.
Use hot poured joint sealer meeting requirements of Section 4136.

2530.03 CONSTRUCTION.

A. Equipment.

1. Remove using milling machine, jack hammer, or similar equipment. Equip milling machines to stop at preset depths to prevent damage to dowel bars and reinforcement. Hand equipment may be necessary to achieve designated shape.

2. The following additional equipment is required:
- **a.** Sandblasting equipment for cleaning prepared patch area.
- **b.** Air chisel, 15 pound (7 kg) (or less), to complete patch area preparation. Larger air chisel, not to exceed 30 pound (14 kg), may be used if it does not result in significant damage to patch area and edges.
- **c.** Air compressor that emits oil and moisture free air for cleaning prepared area.
- **d.** On-site paddle type concrete mixer for mixing Class A patching material or other prepackaged mixtures.

B. Patch Construction.

1. General.
- **a.** Tabulations for partial depth patches shown in the contract documents are for estimating purposes only. Engineer will designate location and limits of patches.
- **b.** Hand operated equipment may be necessary for all or some removal.
- **c.** Remove pavement within designated area to a minimum depth of 2 inches (50 mm) or to sound concrete as determined by the Engineer. Material removed and not designated for salvage becomes property of the Contractor and shall be removed according to Article 1104.08.

2. Preparation of Patch Area.
- **q.** Remove concrete in designated repair area to a minimum width of 12 inches (300 mm) using either of the following methods:
  - **1)** Mill transversely or longitudinally matching general alignment of patch. Use a mill that produces patch edges with a 30 to 60 degree angle or chip back patch edges to a 30 to 60 degree angle. Chip out secondary spalling resulting from milling at no additional cost to the Contracting Authority.
  - **2)** Place 2 inch (50 mm) saw cuts along perimeter of patch area and chip back patch edges to a 30 to 60 degree angle.
- **b.** If a joint or crack is within patch area, construct bottom edge of patch at least 3 inches (75 mm) beyond joint or crack. ~~Minimum patch width will be 12 inch (300 mm).~~
- **c.** Form or saw patch edges to prevent them from protruding beyond edge of existing pavement by more than 3/8 inch (10 mm).
- **d.** Each patch will have a generally rectangular area. Remove concrete to a minimum depth of 2 inches (50 mm). Many areas will require removal of unsound concrete to a greater depth to reach sound concrete. Maximum depth is one half existing pavement thickness.

e. Do not damage steel reinforcement during removal process. Damaged steel will be the responsibility of the Contractor. If the end of a dowel bar is exposed, cut or remove dowel. Place duct tape, form oil, grease, or other method approved by the Engineer as a bond breaker on exposed dowels not removed.

f. When removal to a depth of one half existing pavement thickness leaves unsound concrete within patch area, the Engineer may designate part of the patch area as a Overdepth Patch. Remove concrete for the full depth of the pavement. Consolidate subgrade or subbase material using mechanical tamper or other compaction equipment as directed by Engineer. Furnish and install No. 4 (No. 15) tie bars at mid-depth of existing pavement using an approved non-shrink grout. Place bar to provide a minimum two inch concrete cover.

g. When it is necessary to go below reinforcing steel to reach sound concrete, cut reinforcing steel flush with perimeter patch edges and remove.

h. Clean patch area by sandblasting, followed by cleaning with compressed air. Completed surfaces shall appear surface dry to visual examination.

i. Recreate a joint or crack in patch area with a joint board of proper size and shape. Extend board to bottom of patch area to completely separate patching material on both sides. Use board of a width approximately equal to joint or crack. For wide openings, several thicknesses may be used. For patches 6 feet (2 m) or greater in length~~,~~:

1) ~~L~~longitudinal joints may be reestablished by sawing to a depth of 1/3 the pavement thickness.

2) With approval of the Engineer, transverse joints may be reestablished by sawing the full depth of the patch when use of a form board will not allow complete separation of patch material on both sides of joint.

3. Placing Patch Material.

a. Scrub cement-sand-water grout of creamy consistency onto patch surface, including edges. Grout shall consist of two parts of Type I or Type I/II Portland cement and one part sand mixed with water. Mix grout by mechanical means. Place patch material before grout dries. If grout dries before placement of patch material, clean patch area again by sandblasting and air blasting, then reapply grout.

b. Mix patching material and place in patch area. Consolidate and work into place in a manner ensuring good bonding. Level it with adjacent pavement to provide a smooth riding surface not varying from existing pavement surface by more than 1/8 inch (3 mm) when measured with a 10 foot (3 m) straightedge placed over patch. Replace or grind patch to correct deficiencies. Texture patches longer than 1 foot (0.3 m) in the manner of adjacent pavement surface.

c. For Class A patching materials, perform work according to patching manufacturer's recommendations and limitations, subject to approval of the Engineer. Furnish these recommendations to the Engineer.

4. Surface Finish.

Level partial depth patches with adjacent pavement. Trowel toward edge of the repair when finishing. Edge adjacent to joint boards or inserts in fresh concrete. Ensure they have a smooth riding surface.

5. Protecting and Curing.

a. Class A Patching Material.

Cure according to manufacturer's recommendations. Use minimum curing time according to Materials I.M. 491.20, Appendix A.

b. Class B Patching Material.

1) Cure as specified in Article 2529.03, H.

2) Cure for minimum time specified in Article 2529.02 for mixture used.

c. Class C Patching Material.

1) Cure patches with an approved white pigmented curing compound meeting the requirements of Section 4105. Apply curing compound within 30 minutes after placement of patching material.

2) Cure patches involving Class M concrete a minimum of 36 hours.

3) Cure according to Article 2529.03, H, when overnight low temperatures are forecast to be below 35°F (2°C).

6. Joint and Crack Sealing.
Where joints and cracks cross patches; saw, seal, and clean patch according to Article 2301.03, P. Complete sealing within 5 working days after patch is placed. When joint and crack sealing is included in the contract, perform sealing as part of that operation.

C. Limitations of Operations.

1. Unless road is closed, maintain traffic during construction operations. Conduct operations with minimum inconvenience to traffic. On two-lane roads, limit operations to one traffic lane at a time, except for minor encroachment in adjacent lane for sawing and installing forms when traffic is maintained. For multiple lane roadways, work area may include one lane in each direction.

2. Adjacent lane shall be opened to traffic prior to the pavement being removed from a patch area.

3. When approved by the Engineer, patch areas may extend up to 2 feet (0.6 m) into adjacent lane as allowed by the contract documents.

4. Place PCC patching material when ambient air and pavement temperatures are at least 45°F (7°C).

5. The Engineer may limit advance sawing.

6. If an emergency makes a DW joint necessary, temporarily fill excavated area following the joint with a suitable hot or cold paving mixture or stable granular material, as directed by the Engineer. The Engineer may direct the lane remain closed to traffic overnight. Provide traffic control.

D. Area Restoration.
When patch is completed, remove forms if they have been used. Fill excavated space along outside pavement edge with material similar to existing shoulder, satisfactory to the Engineer. Thoroughly compact material before section is opened to traffic.

E. Failure Repair.
Repair failed patches that appear within 30 calendar days of original construction or subsequent repair at no cost to Contracting Authority. Failures may include, but are not limited to, loss of bond between patch and underlying pavement or random cracking.

2530.04 METHOD OF MEASUREMENT.
Engineer will determine quantities involved in satisfactory construction of partial depth patches for areas specified as follows:

A. Partial Depth PCC Finish Patches.

1. Engineer will calculate area of each patch in square feet (square meters) from surface measurements. Area of each patch less than 1 square foot (0.1 m^2) will be counted as 1 square foot (0.1 m^2) for payment purposes. If patch area is increased by Contractor to accommodate milling equipment, only area designated by the Engineer will be measured for payment.

2. Removal and repair of areas up to one half existing pavement thickness will be included in this payment.

B. Partial Depth PCC Joint and Crack Repair Patches.

2. Measurement for Partial Depth PCC Joint and Crack Repair Patches will be to the nearest 0.1 linear foot (0.1 m) on the basis of ~~10~~ 12 inch (~~260~~ 300 mm) width of repair. Areas designated for repair outside the ~~10~~ 12 inch (~~260~~ 300 mm) repair width will be measured as Partial Depth PCC Finish Patches per Article 2530.04, A, 1.

3. Removal and repair of areas up to one half existing pavement thickness will be included in this payment.

C. Overdepth Patches.
Engineer will calculate area of each Overdepth Patch in square feet (square meters) at the mid-depth of the pavement. Area of each patch less than 1 square foot (0.1 m^2) will be counted as 1 square foot (0.1 m^2) for payment purposes.

2530.05 BASIS OF PAYMENT.
Payment for construction of various types of partial depth patches, satisfactorily constructed, at areas specified, will be the contract unit price as follows:

A. Partial Depth PCC Finish Patches.

1. Per square foot (square meter).

2. Payment is full compensation for repairs up to one half existing pavement thickness and includes removal of pavement, preparing patch area, furnishing and placing material, construction of joints, sawing, finishing, curing, and restoration of area.

B. Partial Depth PCC Joint and Crack Repair Patches.

1. Per linear foot (meter)

2. Payment is full compensation for repairs up to one half existing pavement thickness and includes removal of pavement, preparing the patch area, furnishing and placing material, construction of joints, sawing, finishing, curing, and restoration of area.

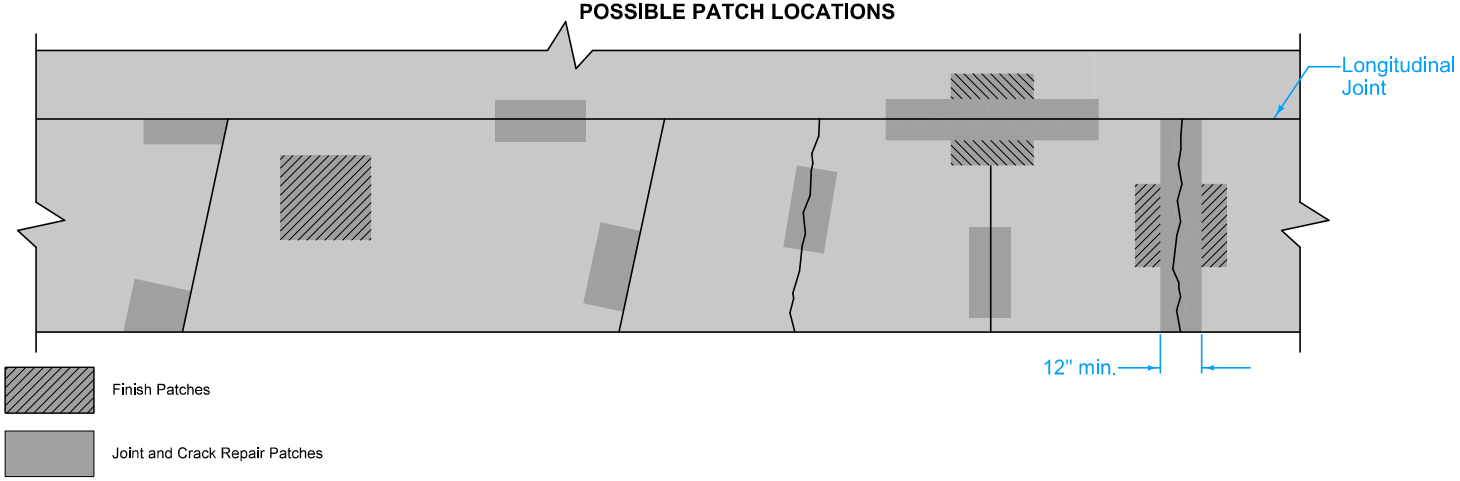
C. Overdepth Patches.

1. Per square foot (square meter). Payment for Overdepth Patches will be in addition to Partial Depth PCC Finish Patch or Partial Depth PCC Joint and Crack Repair Patch quantities for the same area.

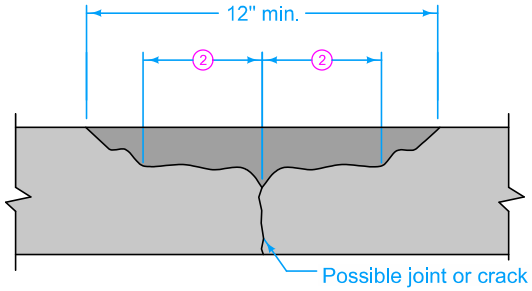
2. Payment is full compensation for repairs designated in lower half of existing pavement and includes removal of pavement, preparing the patch area, and furnishing and placing material.

D. When joint and crack sealing is included in the contract, it will be paid for as a part of that work.

POSSIBLE PATCH LOCATIONS

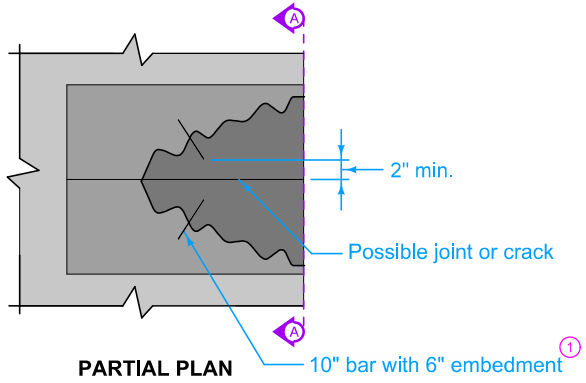


PARTIAL DEPTH PATCH

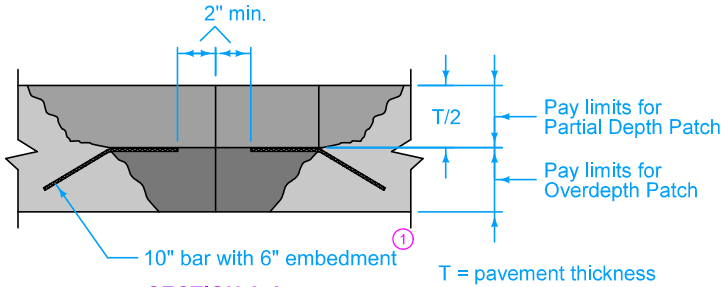


TYPICAL SECTION

OVERDEPTH PATCH



PARTIAL PLAN



SECTION A-A

Partial Depth

Overdepth

See PV-101 for jointing.

1. One per panel.
2. If joint or crack is within patch area, construct bottom edge of patch at least 3 inches beyond crack or joint.

Possible Contract Items:
- Partial Depth PCC Finish Patches
- Partial Depth PCC Joint and Crack Repair Patches
- Overdepth Patches

Possible Tabulation:
- 102-10

MODIFIED STANDARD ROAD PLAN

REVISION	
New	10-21-14

PR-107

SHEET 1 of 1

MODIFICATIONS: New. Replaces Modified RR-27.

PARTIAL DEPTH PCC FINISH PATCHES

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Scott Schram	**Office: Construction and Materials**	**Item 9**
Submittal Date: 7/28/2014	**Proposed Effective Date:** November 2014	
Section No.: 4137 **Title:** Asphalt Binder	**Other:** Supplemental Specifications for Asphalt Binder	

Specification Committee Action:			
Deferred:	**Not Approved:**	**Approved Date:**	**Effective Date:**
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: See attached Draft SS for Asphalt Binder.			
Comments: Revision will be incorporated into the April 2015 GS.			

Section 4137. Asphalt Binder

4137.01 GENERAL REQUIREMENTS.

A. Meet the requirements for the type and grade specified in the contract documents.

B. Determine performance grade according to AASHTO R 29.

C. Do not add acids to modify asphalt binders.

D. For asphalt binder grades with a temperature spread of 92°C or greater[1], meet the requirements of the combined states binder group as follows:

Table 4137.01-1: PG+ Requirements[2]

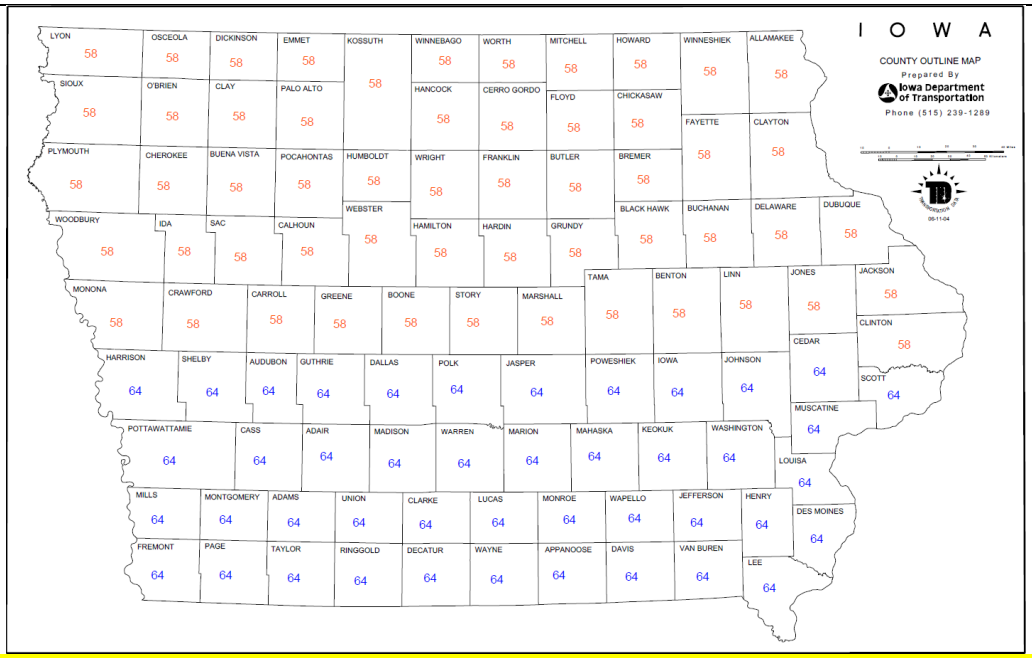
AASHTO R29 Grade	AASHTO T350 Minimum Percent Recovery ($R_{3.2}$) Test Temperature[3]		DSR Phase Angle; degrees (original binder)
	58°C	64°C	
58-34P	30	25	77
64-28P	30	25	77
64-34P	55	45	75
70-22P	55	45	77
70-28P	55	45	75
70-34P	75	75	73
76-28P	75	75	73
76-34P	75	75	73
82-22P	75	75	73

1 Temperature spread is determined by subtracting low temperature from high temperature; for example PG 64-28: 64 - (-28) = 92

2 When a grade change is required to compensate for binder in recycled materials, the virgin binder provided shall meet the above requirements for the original grade specified in the contract documents.

3. See figure 4137.01-01 for test temperatures.

Figure 4137.01-01: AASHTO T350 Test Temperature by County (°C)



~~For asphalt binder grades with a temperature spread of 92° or greater, use binders that meet the PG+ requirements established by the Combined State Binder Group as follows:~~

~~Table 4137.01-1: PG+ Requirements~~

~~Temperature Spread[1, 2]~~	~~92~~	~~98~~	~~104~~
~~Elastic Recovery: AASHTO T 301 at 77° F. (RTFO Aged AASHTO T 240)~~	~~65% min.~~	~~65% min.~~	~~65% min.~~
~~DSR Phase Angle; degrees (original binder)~~	~~77.0 max.~~	~~75.0max.~~	~~73.0 max.~~

~~1 Temperature spread is determined by subtracting low temperature from high temperature; for example PG 64-28: 64 - (-28) = 92~~

~~2 When a grade change is required to compensate for binder in recycled materials, the virgin binder provided shall meet the above requirements for the original grade specified in the contract documents.~~

Reason for Revisions: AASHTO T350 is being adopted to replace T301. Asphalt suppliers have been notified by the CSBG and have agreed to the CSBG limits.

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: Industry is in support of the changes.

County or City Comments:

Industry Comments:

Iowa Department of Transportation

SUPPLEMENTAL SPECIFICATIONS
FOR
ASPHALT BINDER

Effective Date
November 18, 2014

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

Replace Section 4137 with the following:

4137.01 GENERAL REQUIREMENTS.

A. Meet the requirements for the type and grade specified in the contract documents.

B. Determine performance grade according to AASHTO R 29.

C. Do not add acids to modify asphalt binders.

D. For asphalt binder grades with a temperature spread of 92° or greater[1], ~~use binders that~~ meet the ~~PG+~~ requirements ~~established by~~ of the Combined State Binder Group as follows:

Table 4137.01-1: PG+ Requirements[2]

~~Temperature Spread[1, 2]~~	~~92~~	~~98~~	~~104~~
~~Elastic Recovery: AASHTO T 301 at 77° F. (RTFO Aged AASHTO T 240)~~	~~65% min.~~	~~65% min.~~	~~65% min.~~
~~DSR Phase Angle; degrees (original binder)~~	~~77.0 max.~~	~~75.0max.~~	~~73.0 max.~~
~~1 Temperature spread is determined by subtracting low temperature from high temperature; for example PG 64-28: 64 - (-28) = 92~~ ~~2 When a grade change is required to compensate for binder in recycled materials, the virgin binder provided shall meet the above requirements for the original grade specified in the contract documents.~~			

AASHTO R29 Grade	**AASHTO T350 Minimum Percent Recovery ($R_{3.2}$)**		**DSR Phase Angle; degrees (original binder)**
	Test Temperature[3]		
	58°C	**64°C**	
58-34P	30	25	77

64-28P	30	25	77
64-34P	55	45	75
70-22P	55	45	77
70-28P	55	45	75
70-34P	75	75	73
76-28P	75	75	73
76-34P	75	75	73
82-22P	75	75	73

1 Temperature spread is determined by subtracting low temperature from high temperature; for example PG 64-28: 64 - (-28) = 92.

2 When a grade change is required to compensate for binder in recycled materials, the virgin binder provided shall meet the above requirements for the original grade specified in the contract documents.

3 See figure 4137.01-01 for test temperatures.

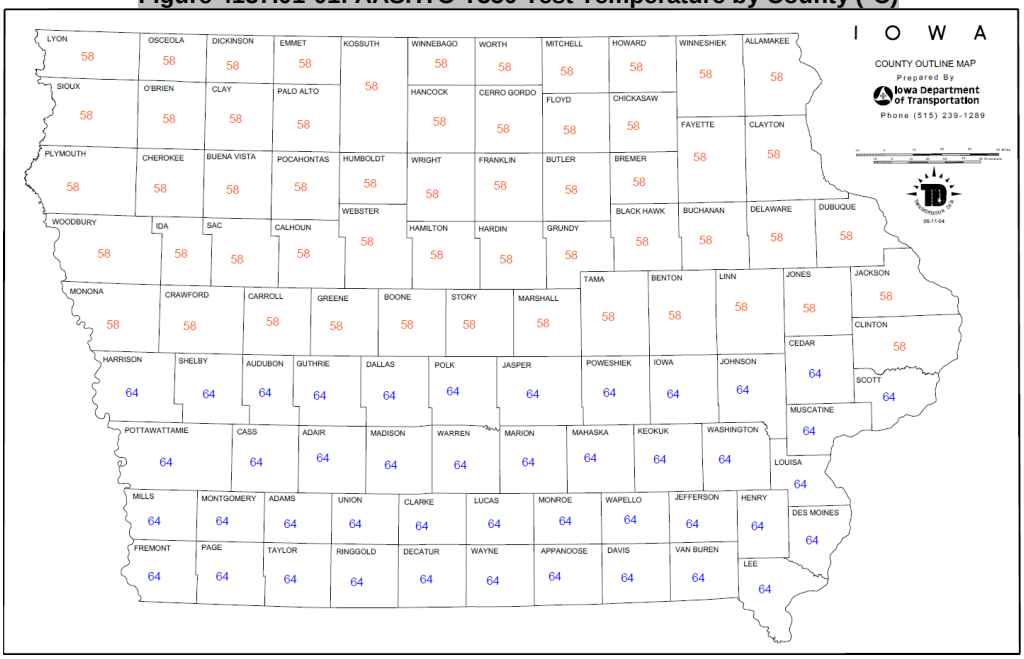



Figure 4137.01-01: AASHTO T350 Test Temperature by County (°C)