



Iowa Department of Transportation

MINUTES OF IOWA D.O.T. SPECIFICATION COMMITTEE MEETING

November 2, 2010

Members Present:	Jim Berger Roger Bierbaum Donna Buchwald Eric Johnsen, Secretary Bruce Kuehl Gary Novey Dan Redmond Tom Reis, Chair John Smythe	Office of Materials Office of Contracts Office of Local Systems Specifications Section District 6 - Construction Office of Bridges & Structures District 4 - Materials Specifications Section Office of Construction
Members Not Present:	John Adam Troy Jerman Deanna Maifield Doug McDonald	Statewide Operations Bureau Office of Traffic & Safety Office of Design District 1 - Marshalltown RCE
Advisory Members Present:	Lisa Rold	FHWA
Others Present:	Daniel Harness John Narigon Scott Schram Ole Skaar	Office of Design Office of Traffic & Safety Office of Materials Office of Design

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed in accordance with the revised agenda dated November 1, 2010:

1. Article 2001.22, K, 1, g, Plant Equipment for Hot Mix Asphalt Mixtures.

The Office of Materials requested changes to HMA batch plant requirements regarding using recycled asphalt materials.

2. Section 2303, Hot Mix Asphalt Mixtures.

The Office of Materials requested changes to clarify frictional credit for RAP and require anti-strip agent for small quantity paving.

**3. Article 2529.02, B, 8, Transit Mix Concrete (Full Depth Finish Patches).
Article 2530.02, B, 4, h, Transit Mix Concrete (Partial Depth Finish Patches).**

The Office of Materials requested changes to clarify use of retarder in concrete mix for patches.

**4. Article 2529.04, Method of Measurement (Full Depth Finish Patches).
Article 2529.05, Basis of Payment (Full Depth Finish Patches).**

The Office of Design requested changes to add a bid item for subdrains for patches.

5. Section 2546, Gabion Baskets and Revet Mattresses.

The Office of Materials requested changes to update the specification per ASTM requirements for each separate style of basket.

6. Article 2601.03, Placement of Erosion Control.

The Office of Design requested changes to clarify the need for mulching if seeding is not accomplished by September 30th.

**7. Section 2602, Water Pollution Control (Soil Erosion).
Section 4169, Erosion Control Materials.**

The Office of Design requested changes to add new silt control methods to the specifications.

8. Article 4100.03, Measurement of Liquid Bituminous Materials.

The Office of Materials requested changes to correct a change to an ASTM reference.

9. Article 4185.15, A, Highway Lighting Materials.

The Specifications Section requested changes suggested by the Department's statewide lighting consultant.

10. DS-09XXX, Warm Mix Asphalt.

The Office of Materials requested changes to the Developmental Specifications for Warm Mix Asphalt.

11. DS-09XXX, PCC Paving 3-D Machine Control.

The Office of Construction requested approval of Developmental Specifications for PCC Paving 3-D Machine Control.

12. DS-09XXX, Recycled Asphalt Shingles.

The Office of Materials requested changes to the Developmental Specification for Recycled Asphalt Shingles.

13. SS-09XXX, Asphalt Emulsions Containing Gilsonite.

The Office of Materials requested approval of Supplemental Specifications for Asphalt Emulsions Containing Gilsonite.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials	Item 1
Submittal Date: October 20, 2010		Proposed Effective Date: April 2011	
Article No.: 2001.22, K,1, g Title: Plant Equipment for Hot Mix Asphalt Mixtures		Other:	
Specification Committee Action: Approved with changes.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text: 2001.22, K, 1, g. Add new Article: 6) For each job mix formula within a project, provide daily printouts identifying weight of RAP separately from total batch as recorded by a totalizer.			
Comments: The committee decided not to incorporate recommended terminology change referring to RAM instead of RAP. The RAP to RAM change will happen when the entire specification book can be revised. The DS for Recycled Asphalt Shingles (RAS) will be revised to add a reference to this Article.			
Specification Section Recommended Text: 2001.22, K, 1, g. Replace the Article: g. When adding RAP recycled asphalt materials (RAM): 1) Modify batch plant equipment to provide for accurate proportioning of the recycled material and for adding it directly into the weigh hopper, with weighing as a separate increment of the total batch. 2) The RAP RAM may be added to the hot elevator with no preheating. In any method where preheating is being done, the equipment must be specifically designed for this purpose. 3) For RAP RAM proportioning systems, meet the requirements of Article 2001.22, A. 4) When the heat transfer method is used, superheat the new aggregate so that, when combined with the RAP RAM, the temperature of the resultant mixture will meet all requirements for mixing and placing the hot mixture. 5) Obtain the Engineer's approval for each plant modified for recycling mixtures. 6) For each job mix formula within a project, provide daily printouts identifying the weight of RAM separately from the total batch as recorded by a totalizer.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.) Add to Article 2001.22, K, 1, g g. When adding RAP recycled asphalt materials (RAM): 1) Modify batch plant equipment to provide for accurate proportioning of the recycled material and for adding it directly into the weigh hopper, with weighing as a separate increment of the total batch. 2) The RAP RAM may be added to the hot elevator with no preheating. In any method where preheating is being done, the equipment must be specifically designed for this purpose. 3) For RAP RAM proportioning systems, meet the requirements of Article 2001.22, A. 4) When the heat transfer method is used, superheat the new aggregate so that, when combined with the RAP RAM, the temperature of the resultant mixture will meet all requirements for mixing and placing the hot mixture. 5) Obtain the Engineer's approval for each plant modified for recycling mixtures. 6) For each job mix formula within a project, provide daily printouts containing the weight of RAM separately from the total batch as recorded by a totalizer.			

Reason for Revisions: Batch plants often do not have totalizers on RAP belts and therefore the actual quantity of RAP used for the day is not known, but estimated from the mix design. Furthermore, some plants can provide a total for the day, but not per mix.					
County or City Input Needed (X one)			Yes	No X	
Comments:					
Industry Input Needed (X one)			Yes	No X	
Industry Notified:	Yes X	No	Industry Concurrence:	Yes	No X
Comments: These recommended changes came from the DMEs. Item #3 refers to 2001.22 which requires separate totalizers for drum mixers; however, a contractor has interpreted this a conflict since it does not mention batch plants. The proposed revision addresses this conflict. The industry has resisted costly plant or software upgrades. Few plants would be affected. Because we pay for the asphalt in the RAP, estimating RAP usage from a mix design would likely not satisfy an audit as RAP quantities can vary in production.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials	Item 2
Submittal Date: October 20, 2010		Proposed Effective Date: April 2011	
Section No.: 2303 Title: Hot Mix Asphalt Mixtures		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: The Office of Materials clarified that the revision to Article 2303.02, E, 2, e, applies to mixture bid quantities less than 1000 tons. The command for the last revision was corrected to say third sentence.			
Specification Section Recommended Text:			
2303.02, C, 6, a, 3. Replace the first sentence of the Article: Credit for the +4 proportion of frictional aggregate may be given for virgin aggregates used in the original pavement to be reclaimed.			
2303.02, C, 6, a. Add the Article: 4) Credit may be given for crushed particles in the original pavement to be reclaimed as determined in the paving history (or mix design when paving history is unavailable).			
2303.02, E, 2, c. Replace the Article: c. Moisture susceptibility testing of plant produced mixture will not be required for base repair, patching, or temporary pavement, or mixture bid items of 1000 tons (1000 Mg) or less.			
2303.02, E, 2, e. Replace the first sentence of the Article: For mixture bid items of more than 1000 tons (1000 Mg), When the Contractor's mix design TSR results are greater than or equal to 80% and less than 90%, an anti-strip agent will be required until the Contracting Authority's TSR results on the plant produced mixture are equal to or exceeding 80%.			
2303.03, E, 1. Add to the end of the Article: For mixtures meeting the criteria in Articles 2303.02, E, 2, a or b: a) An anti-stripping agent is required. b) Use Materials I.M. 507 to optimize the design dosage rate. c) When prior-approved designs have demonstrated acceptable field TSR values, the anti-stripping agent and dosage from the JMF may be used in lieu of optimization testing.			
2303.03, E, 4. Add the Article: d. Moisture susceptibility testing on plant produced mixture is not required.			
2303.05, D, 1. Replace the third sentence of the Article: For HMA mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80%.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .) Remove from Article 2303.02, C, 6, a, 3 3) Credit for the +4 proportion of frictional aggregate may be given for virgin aggregates used in the original pavement to be reclaimed. Types 4 and 5 frictional			

aggregate content in the RAP may be given full credit, while Types 2 and 3 content may be given credit for half the proportion in the original pavement. Credit may be used toward the total frictional aggregate requirement. No frictional credit shall be given beyond one generation of the RAP's service life.

Add to Article 2303.02, C, 6, a

- 4) Credit may be given for crushed particles in the original pavement to be reclaimed as determined in the paving history (or mix design when paving history is unavailable).

Add to Article 2303.02, E, 2, c

- c. Moisture susceptibility testing of plant produced mixture will not be required for base repair, patching, or temporary pavement, or mixture bid items of 1000 tons (1000 Mg) or less.

Add to Article 2303.02, E, 2, e

- e. For mixture bid items of more than 1000 tons (1000 Mg), ~~W~~hen the Contractor's mix design TSR results are greater than or equal to 80% and less than 90%, an anti-strip agent will be required until the Contracting Authority's TSR results on the plant produced mixture are equal to or exceeding 80%. Plant produced material without anti-strip shall be tested without penalty to confirm the need for an anti-strip agent. See Materials I.M. 510 Appendix C of this specification for additional information.

Add to Article 2303.03, E, 1

1. Mix Design.

Prepare the JMF. Prior to HMA production, obtain the Engineer's approval for the JMF. Comply with Article 2303.02 and Materials I.M. 510. For mixtures meeting the criteria in 2303.02, E, 2, a or b:

- a) An anti-stripping agent is required.
- b) Use Materials I.M. 507 to optimize the design dosage rate.
- c) When prior-approved designs have demonstrated acceptable field TSR values, the anti-stripping agent and dosage from the JMF may be used in lieu of optimization testing.

Add to Article 2303.03, E, 4

- d. Moisture susceptibility testing on plant produced mixture is not required.

Add to Article 2303.05, D, 1

- 1. When anti-strip agent is required, the incorporation of the anti-strip agent into the asphalt mixture will be considered as extra work ordered by the Engineer if the Contracting Authority's TSR results from the field produced mixture meet or exceed the minimum requirement. Payment will be made at the rate of \$2.00 per ton (megagram) of asphalt mixture in which the anti-strip agent is incorporated. For HMA mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80%.

Reason for Revisions: Type 2 frictional credit is now given for fine and coarse portions of RAP. Crushed particle credit is clarified in 2303 after being removed from 4127.

Bid item production for small quantities will be finished before T283 test results are known. For small quantities, anti-strip is required for certain mixes unless prior use of the mix has shown it is not needed. The design will be optimized for anti-strip, but the field mix will not be tested. Payment will be \$2/ton as normal.

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

Industry Input Needed (X one)			Yes X	No	
Industry Notified:	Yes X	No	Industry Concurrence:	Yes X	No
Comments: These recommended changes came from the QMA steering committee and approved by DMEs.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials	Item 3
Submittal Date: August 23, 2010		Proposed Effective Date: April 2011	
Article No.: 2529.02, B, 8 Title: Transit Mix Concrete (Full Depth Finish Patches) Article No.: 2530.02, B, 4, h Title: Transit Mix Concrete (Partial Depth Finish Patches)		Other:	
Specification Committee Action: The Office of Materials withdrew this revision.			
Deferred:	Not Approved: X	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments: The Offices of Materials and Construction agreed that this revision did not need to be implemented. The Office of Construction would like to see some research verifying that calcium chloride counteracts the effects of the retarder and we are getting adequate strength on patches before the roadway is opened to traffic.			
Specification Section Recommended Text:			
2529.02, B, 8, Transit Mix Concrete.			
Replace the Article:			
Use a mix from a plant from which the concrete can be delivered and placed within 60 minutes from the time of mixing. With the Engineer's approval, the time may be extended to 90 minutes when a retarding admixture, used according to in Materials I.M. 403 including temperature dosage guidelines (and at no additional cost to the Contracting Authority), is added at the plant (at no additional cost to the Contracting Authority). Determine dosage rate based on desired haul time. Continuous mixing equipment using volumetric proportioning may be used according to Article 2001.20, E. Place the concrete within 30 minutes after introduction of calcium chloride.			
2530.02, B, 4, h, Transit Mix Concrete.			
Replace the Article:			
Use a mix from a plant from which the concrete can be delivered and placed within 60 minutes from the start of mixing. With the Engineer's approval, the time may be extended to 90 minutes when a retarding admixture, used according to in Materials I.M. 403 including temperature dosage guidelines (and at no additional cost to the Contracting Authority), is added at the plant (at no additional cost to the Contracting Authority). Determine dosage rate based on desired haul time. Continuous mixing equipment using volumetric proportioning may be used according to Article 2001.20, E.			
Comments: The following comments are from the October Specification Committee meeting: The District 6 Office questioned whether I.M. 403 gives times for the determined dosage rates. The District 6 Office asked if the Office of Materials will be doing testing on use of retarder and calcium chloride. Deferred per request (following meeting) from the Office of Materials. The Offices of Materials and Construction will review prior to next meeting.			
Member's Requested Change (Redline/Strikeout):			
8. Transit Mix Concrete.			
Use a mix from a plant from which the concrete can be delivered and placed within 60 minutes from the time of mixing. With the Engineer's approval, the time may be extended to 90 minutes when a retarding admixture, used according to in Materials I.M. 403 including temperature dosage guidelines (and at no additional cost to the Contracting Authority); is added at the plant (at no additional cost to the Contracting Authority). Determine dosage rate based on desired haul time. Continuous mixing equipment			

using volumetric proportioning may be used according to Article 2001.20, E. Place the concrete within 30 minutes after introduction of calcium chloride.					
Reason for Revision:					
County or City Input Needed (X one)			Yes	No	
Comments:					
Industry Input Needed (X one)			Yes	No	
Industry Notified:	Yes X	No	Industry Concurrence:	Yes	No
Comments: Clarification of retarder usage for patching.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Deanna Maifield		Office: Design	Item 4
Submittal Date: 9/24/10		Proposed Effective Date: 4/19/11	
Article No.: 2529.04 Title: Method of Measurement Article No.: 2529.05 Title: Basis of Payment		Other:	
Specification Committee Action: Approved with changes.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text:			
2529.02, Materials.			
Add new Article:			
F. Patch Subdrain.			
Meet the requirements of Article 2502.02.			
2529.03, F, Subdrains.			
Replace the Article:			
1. When subbase material and longitudinal subdrains are required by the contract documents or the Engineer, place the subbase as backfill material to drain to the longitudinal subdrain.			
2. If longitudinal subdrain will not be placed, or is not present, on the side of the roadway to be patched, place patch subdrain according to Article 2502.03, C and the contract documents.			
2529.05, D, 2.			
Delete the third bullet:			
• Construction of transverse subdrains, and			
2529.04, Method of Measurement			
Renumber Articles E and F and Add new article:			
E. Patch Subdrain.			
By count.			
E-F. Removal of Anchor Lugs.			
E-G. Rumble Strip Panel (In Full Depth Patch)			
2529.05, Basis of Payment.			
Renumber Articles E and F and Add new article:			
E. Patch Subdrain.			
1. Each.			
2. Payment is full compensation for the following:			
• Excavation of the trench and removal of excess trench material from the project, and			
• Furnishing and placing 4 inch (100 mm) perforated corrugated polyethylene pipe, porous backfill, impervious fill, shoulder material, and rodent guard.			
E-F. Removal of Anchor Lugs.			
E-G. Rumble Strip Panel (In Full Depth Patch).			

4143.01, General Requirements.

Add new Article:

D. Patch Subdrains.

Follow requirements for Article 4143.01, B, except that subdrain outlets will not be required.

Comments: The Office of Design requested to add an Article to 4143.01 to cover Patch Subdrains.

The Office of Design requested to keep the language that is currently in Article 2529.03, F.

The Office of Design asked if patch subdrains will cause confusion related to the language currently in the specifications for lateral shoulder subdrains (Article 2502.03, C, 7). The committee approved deleting the words "and lateral shoulder" from this Article. Following the meeting, the Office of Design requested to leave this language in the specification after reviewing the applicable road standards.

There was a correction to the third revision. The bullet being deleted is in Article 2529.05, D, 2.

Specification Section Recommended Text:

2529.02, Materials.

Add new Article:

F. Patch Subdrain.

Meet the requirements of Article 2502.02.

2529.03, F, Subdrains.

Replace the Article:

~~When subbase material and longitudinal subdrains are required by the contract documents or the Engineer, place the subbase as backfill material to drain to the longitudinal subdrain. If longitudinal subdrain is not to be placed or is not present on the side of the roadway to be patched, place patch subdrain according to Article 2502.03, C and contract documents.~~

2529.04, D, 2.

Delete the third bullet:

- ~~• Construction of transverse subdrains, and~~

2529.04, Method of Measurement

Renumber Articles E and F and **Add** new article:

E. Patch Subdrain.

By count.

~~**E-F. Removal of Anchor Lugs.**~~

~~**F-G. Rumble Strip Panel (In Full Depth Patch)**~~

2529.05, Basis of Payment.

Renumber Articles E and F and **Add** new article:

E. Patch Subdrain.

1. Each.

2. Payment is full compensation for the following:

- Excavation of the trench and removal of excess trench material from the project, and
- Furnishing and placing 4 inch (100 mm) perforated corrugated polyethylene pipe, porous backfill, impervious fill, shoulder material, and rodent guard.

~~**E-F. Removal of Anchor Lugs.**~~

~~**F-G. Rumble Strip Panel (In Full Depth Patch)**~~

Comments: The following comments are from the October Specification Committee meeting:
 Some offices are concerned that the DOT is paying for transverse subdrains on all patches whether they are required or not, because the contractor doesn't know if they will be required. This will hopefully reduce the cost of patches, since the transverse subdrains will be paid for separately.
 The Office of Contracts asked if "Longitudinal Subdrains (Patches)" is the correct name for this item since they are constructed in the transverse direction. The Office of Design used the longitudinal subdrain designation because they are constructed per longitudinal subdrain details.
 The Specifications Section asked how the patching specifications connect back to the subdrain specifications. Specification language will need to be added to Section 2529 to include materials and construction methods (can be handled by reference to Section 2502).
 The Office of Design will re-submit this item with added specification language for patch subdrains.

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use **Strikeout and **Highlight**.)**
2529.04, Method of Measurement.

D. Subbase (Patches).

2. Payment is full compensation for:

- Furnishing and installing subbase,
- Additional excavation necessary for this placement and the removal of excavated material,

Remove third bullet

- ~~• Construction of transverse subdrains, and~~
- Placing backfill material in the disturbed shoulder area.

Add a new article:

E. Longitudinal Subdrains (Patches).

By count.

Renumber Articles E and F as Articles F and G respectively.

2529.05, Basis of Payment.

Add a new article:

E. Longitudinal Subdrains (Patches).

1. Each.

2. Payment is full compensation for furnishing and installing shoulder material, impervious fill, porous backfill, 4 inch perforated corrugated polyethylene pipe, and rodent guard.

Renumber Articles E and F as Articles F and G respectively.

Reason for Revision: This change is associated with Standard Road Plan RR-26. Because of the work and materials involved, Design feels installation of the subdrain should be paid for separately. Contracts will create a bid item after this change has been approved.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials	Item 5
Submittal Date: October 20, 2010		Proposed Effective Date: April 2011	
Section No.: 2546 Title: Gabion Baskets and Revet Mattresses		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: No comments.			
Specification Section Recommended Text:			
2546.02, Materials and Fabrication.			
Replace the third sentence and add new sentence:			
At the Contractor's option, for lid fastening of twisted mesh baskets at edges and diaphragms, either "Lacing Wire" or "Steel Ring Fastener System" may be used. For welded wire mesh baskets, use "Lacing Wire" for lid fastening at edges and diaphragms. Baskets shall be fabricated by twisting or welding a mesh from steel wire.			
2546.02, A, Baskets.			
Renumber Articles 4, 5, 6, and 7 to 5, 6, 7, and 8.			
Replace Articles 1, 2, and 3 with the following Articles 1, 2, 3, and 4:			
1. DoubleTwisted Wire Baskets			
a. Twisted wire mesh for gabion baskets and revet mattresses shall be formed in a uniform hexagonal pattern with double twists so bound as to prevent unraveling.			
b. Twisted wire mesh baskets shall meet the requirements of ASTM A 975 and fabricated from soft temper galvanized wire with a Class III Coating in accordance with ASTM A 641 (Style 1) and, if specified, subsequently coated with PVC (Style 3).			
c. For gabions, the mesh opening shall not exceed 4.5 inches (115 mm), and area shall not exceed 10 square inches (6450 mm ²).			
d. For mattresses, the maximum linear dimension of mesh opening shall not exceed 3.25 inches (80 mm).			
e. Wire for twisted wire mesh gabion baskets, revet mattresses, edges and selvage shall have a tensile strength of 60,000 to 70,000 psi (413.7 to 485 MPa).			
f. Wire for lacings and connections of twisted wire mesh gabions and mattresses shall have a tensile strength of 60,000 to 75,000 psi (413.7 to 515 MPa).			
2. Welded Wire Baskets			
a. Welded wire baskets shall meet the requirements of ASTM A 974, Style 2, manufactured from uncoated hard drawn steel wire conforming to ASTM A 853 and the fabric subsequently coated with zinc using the hot dip process; if specified, the galvanized fabric may have an additional coating of PVC (Style 5).			
b. Weight of the zinc coating on the fabric shall conform to the requirements of ASTM A 641 Class 3.			
c. Welded wire mesh for gabion baskets shall have each connection welded to obtain a minimum average shear strength of 584 pounds (2600 N), with a minimum shear strength of 450 pounds (2000 N).			
d. For revet mattresses, the minimum average shear strength of welded connections shall be 292 pounds (1300 N), with a minimum shear strength of 225 pounds (1000 N).			
e. Wire shall have a minimum tensile strength of 80,000 psi (550.0 MPa) for welded wire baskets and mattresses.			
f. For gabions, the mesh opening shall not exceed 3 inches (76.2 mm), and area shall not exceed 9 square inches (5806 mm ²).			
g. For mattresses, the mesh opening shall not exceed 3 by 1.5 inches (76 by 38 mm).			
3. Wire.			

Ensure wire complies with the following:

- a. Mesh, edge, and selvage wire are the same material.
- b. Minimum sizes shown in Table 2546.02-1:

Table 2546.02-1: Minimum Wire Sizes

	Gabions	Mattresses
Mesh	11 gage (3.06 mm)	13 1/2 gage (2.18 mm)
Edges and selvage	9 gage (3.76 mm)	11 gage (3.06 mm)
Lacing and connecting	13 1/2 gage (2.18 mm)	13 1/2 gage (2.18 mm)

4. Steel Ring Fastener System.

Steel Ring Fastener System may be used only with twisted mesh wire baskets. Ensure one of the following is used:

- Galvanized 11 gage (3.05 mm) wire with a tensile strength meeting the requirements of ASTM A 764, Class I Tensile, and with a Class 3, Type B or C coating of a minimum of 0.80 ounce (244 g) of zinc per square foot (square meter).
- Stainless steel 11 gage (3.05 mm) wire (use only with PVC coated gabion baskets and mattresses) with a tensile strength meeting the requirements of ASTM A 313, Type 302, Class I.

Comments:

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

Section 2546. Gabions and Revet Mattresses

2546.01 DESCRIPTION.

Gabions are intended for high strength installations in both horizontal and vertical structures. Revet mattresses are intended for lower strength, horizontal or nearly horizontal structures.

2546.02 MATERIALS AND FABRICATION.

Ensure gabions and mattresses are constructed using materials meeting the following requirements. Ensure they are fabricated as required for gabions, unless mattresses are specifically designated in the contract documents. At the Contractor's option, for lid fastening **of twisted mesh baskets** at edges and diaphragms, either the "Lacing Wire" or the "Steel Ring Fastener System" may be used. **For welded wire mesh baskets, the contractor may use "Lacing Wire" for lid fastening at edges and diaphragms. Baskets are to be fabricated by twisting or welding a mesh from galvanized steel wire.**

A. Baskets.

1. ~~General~~ Double Twisted Wire Baskets

- a. Twisted wire mesh for gabion baskets and revet mattresses ~~is are~~ to be formed in a uniform hexagonal pattern with double twists so bound as to prevent unraveling. ~~Baskets are to be fabricated by twisting or welding a mesh from galvanized steel wire.~~
- b. ~~Twisted wire mesh baskets are to meet the requirements of ASTM A975 and fabricated from soft temper galvanized wire with a Class III Coating in accordance with ASTM A641 (Style 1) and, if specified, subsequently coated with PVC (Style 3).~~
- c. For gabions, the mesh opening is not to exceed 4 1/2 inches (115 mm), and its area is not to exceed 10 square inches (6450 mm²).
- d. For mattresses, the maximum linear dimension of mesh opening is not to exceed 3 1/4 inches (80 mm).
- e. ~~Wire for twisted wire mesh gabion baskets, revet mattresses, edges and selvage is to have a tensile strength of 60,000 psi to 75 70,000 psi (413.7 MPa to 517.4 485 MPa).~~
- f. ~~Wire for edges and selvage lacings and connections of twisted wire mesh gabions and mattresses is to have a tensile strength of 60,000 psi to 70-75,000 psi (413.7 MPa to 482.7 515 MPa).~~

2. Welded Wire Baskets

- a. ~~Welded wire baskets are to meet the requirements of ASTM A974, Style 2, manufactured from uncoated hard drawn steel wire conforming to ASTM A853 and the fabric subsequently coated with zinc using the hot dip process; if specified, the galvanized fabric may have an additional coating of PVC (Style 5).~~
- b. ~~Weight of the zinc coating on the fabric is to conform to the requirements of ASTM A641 Class 3,ed according to ASTM A 764, Class III, Type B Coating, except all wire coated with 0.80 ounce (244 g) of zinc per foot (square meter).~~
- c. ~~Welded wire mesh for gabion baskets is to have each connection welded to obtain a minimum~~

- average shear strength of 584.5 pounds (2600 N), with a minimum shear strength of 450 pounds (2000 N).
- d. For revet mattresses, the minimum average shear strength of welded connections is to be 292 pounds (1300 N), with a minimum shear strength of 225 pounds (1000 N).
 - e. Wire is to have a minimum tensile strength of 80,000 psi (550.0 MPa) for welded wire baskets and mattresses.
 - f. For gabions, the mesh opening is not to exceed 4 1/2 inches (115.76.2 mm), and its area is not to exceed 9.40 square inches (6450.5806 mm²).
 - g. For mattresses, the maximum linear dimension of mesh opening is not to exceed 3 by 1 1/2 inches (80.76 by 38 mm).

3. Wire.

Ensure wire complies with the following:

- a. Mesh, edge, and selvage wire are the same material.
- b. Minimum sizes shown in Table 2546.02-1:

	Gabions	Mattresses
Mesh	11 gage (3.06 mm)	13 1/2 gage (2.18 mm)
Edges and selvage	9 gage (3.76 mm)	11 gage (3.06 mm)
Lacing and connecting	13 1/2 gage (2.18 mm)	13 1/2 gage (2.18 mm)

4. Steel Ring Fastener System.

Steel Ring Fastener System may be used only with twisted mesh wire baskets. Ensure one of the following is used:

- Galvanized 11 gage (3.05 mm) wire with a tensile strength meeting the requirements of ASTM A 764, Class I Tensile, and with a Class III, Type B C coating of a minimum of 0.80 ounce (244 g) of zinc per square foot (square meter).
- Stainless steel 11 gage (3.05 mm) wire (use only with PVC coated gabion baskets and mattresses) with a tensile strength meeting the requirements of ASTM A 313, Type 302, Class I.

*Change the numbering of the rest of the subsections to 5, 6, 7, and 8.

Reason for Revision: Update the specification per ASTM requirements for each separate style of basket.

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

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Deanna Maifield		Office: Design	Item 6
Submittal Date: October 20, 2010		Proposed Effective Date: April 19,2011	
Article No.: 2601.03		Other:	
Title: Placement of Erosion Control			
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text: See Specification Section Recommended Text.			
<p>Comments: The Office of Design explained that this becomes an issue typically on projects with incidental seeding. Subcontractors do not want to come out unless they are required to.</p> <p>The Office of Design will revise the 232-3 series standard plan notes (incidental seeding) so that they clarify two mulchings may be required if seeding is not completed by September 30th.</p> <p>On projects with bid items for erosion control, mulch will overrun if fall mulching is required. The contractor/subcontractor will be paid at the contract unit price.</p> <p>The Office of Contracts asked if it was fair for the erosion control subcontractors to bid not knowing how many mulchings will be required (in incidental cases). The issue will have to be addressed between the prime and the subcontractor.</p>			
Specification Section Recommended Text:			
<p>2601.03, B, 4.</p> <p>Add as the third sentence:</p> <p>If an area is disturbed, but not seeded by September 30th, scarify the area to a 3 inch (75 mm) depth and mulch.</p>			
<p>2601.03, C, 1.</p> <p>Add new Article:</p> <p>e. If an area is disturbed, but not seeded with stabilizing crop by September 30th, scarify to a 3 inch (75 mm) depth and mulch.</p>			
<p>2601.03, E, 1, Time of Mulching.</p> <p>Add as the second sentence:</p> <p>If an area is disturbed, but not seeded by September 30th, scarify the area to a 3 inch (75 mm) depth and mulch.</p>			
Comments:			
<p>Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)</p> <p>2601.03, B, 4, Seeding.</p> <p>Add as the third sentence:</p> <p>If an area is disturbed but not seeded by September 30, scarify the area to a 3 inch depth and mulch.</p>			
<p>2601.03, C, Stabilizing Crop Seeding and Fertilizing.</p> <p>Add as paragraph e:</p> <p>If an area is disturbed but not seeded with stabilizing crop by September 30, scarify to a 3 inch depth and mulch.</p>			
<p>2601.03, E, 1, Mulching.</p> <p>Add as the second sentence:</p>			

If an area is disturbed but not seeded by September 30, scarify the area to a 3 inch depth and mulch.					
Reason for Revision: To clarify the need for mulching if seeding not is accomplished by September 30.					
County or City Input Needed (X one)			Yes	No X	
Comments:					
Industry Input Needed (X one)			Yes	No X	
Industry Notified:	Yes	No X	Industry Concurrence:	Yes	No
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Deanna Maifield		Office: Design	Item 7
Submittal Date: October 20, 2010		Proposed Effective Date: April 19, 2011	
Article No.: 2602 Title: Water Pollution Control (Soil Erosion) Article No.: 4169 Title: Erosion Control Materials		Other:	
Specification Committee Action: Approved with changes.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 4/19/2011
Specification Committee Approved Text:			
<p>2602.03, C.</p> <p>Replace the first bullet and Add as the second bullet:</p> <ul style="list-style-type: none"> • Constructing or installing silt fence, silt fence for ditch checks, silt ditches, silt dikes, silt basins, and slope drains, and • Constructing or installing perimeter and slope sediment control devices (straw wattles, wood excelsior logs, or filter socks filled with compost filter material), and 			
<p>2602.04, Method of Measurement.</p> <p>Add new Article:</p> <p>L. Perimeter and Slope Sediment Control Device. Linear feet (meters) to the nearest foot (meter) of each size.</p>			
<p>2602.05, A.</p> <p>Add new Article:</p> <p>12. Perimeter and Slope Sediment Control Device. Per linear foot (meter) for length of device of each size properly installed.</p>			
<p>4169, Erosion Control Materials.</p> <p>Add new Article:</p> <p>4169.12, Perimeter and Slope Sediment Control Device.</p> <p>A. Wattles and Sediment Logs. Wood excelsior or straw contained in a tube of photodegradable open weave fabric (synthetic netting). Install according to manufacturer's recommendations.</p> <p>B. Filter Socks. Continuous, tubular, knitted mesh netting with 3/8 inch (10 mm) opening fabricated using 5 mil (0.125 mm) thickness photodegradable HDPE and filled with a filter material consisting of compost from an approved source meeting Article 4169.08. Fill sock by blowing filter material into tube with a pneumatic blower truck or similar device. Hand filling will not be allowed. Install according to manufacturer's recommendations.</p> <p>C. Approved perimeter and slope sediment control devices are listed in Materials I.M. 469.10, Appendix E.</p>			
<p>Comments: The Office of Contracts wondered how the quantity will be estimated for a project. If the quantity is low, the contractor could submit a high unit price, assuming the quantity will overrun. The Office of Design has not noticed any problems so far. Typical bid quantities will be high enough to keep the contractors from playing games with their bids.</p> <p>The Office of Construction requested that we add "of each size" to the MOM and BOP since there will be bid items for different sizes of perimeter and slope sediment control devices.</p> <p>The Office of Materials requested that we add a reference to the Materials I.M. that shows the</p>			

approved devices. The Materials I.M. will be effective in April 2011.

Specification Section Recommended Text:

2602.03, C.

Replace the first bullet and **Add** as the second bullet:

- Constructing or installing silt fence, silt fence for ditch checks, silt ditches, silt dikes, silt basins, and slope drains, ~~and~~
- Constructing or installing perimeter and slope sediment control devices (straw wattles, wood excelsior logs, or filter socks filled with compost filter material), and

2602.04, Method of Measurement.

Add new Article:

L. Perimeter and Slope Sediment Control Device.

Linear feet (meters) to the nearest foot (meter).

2602.05, A.

Add new Article:

12. Perimeter and Slope Sediment Control Device.

Per linear foot (meter) for length of device properly installed.

4169, Erosion Control Materials.

Add new Article:

4169.12, Perimeter and Slope Sediment Control Device.

A. Wattles and Sediment Logs.

Wood excelsior or straw contained in a tube of ultraviolet (UV) degradable open weave fabric (synthetic netting). Install according to manufacturer's recommendations.

B. Filter Socks.

Continuous, tubular, knitted mesh netting with 3/8 inch (10 mm) opening fabricated using 5 mil (0.125 mm) thickness photodegradable HDPE and filled with a filter material consisting of compost from an approved source meeting Article 4169.08. Fill sock by blowing filter material into tube with a pneumatic blower truck or similar device. Hand filling will not be allowed. Install according to manufacturer's recommendations.

Comments: Do we need something for clean-out and removal?

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

2602.03, C, Construction.

Replace the first bullet and **Add** as the second bullet:

- Constructing or installing silt fence, silt fence for ditch checks, silt ditches, silt dikes, silt basins, and slope drains, ~~and~~
- Constructing or installing perimeter and slope sediment control devices (straw wattles, wood excelsior logs, or filter socks filled with compost filter material), and

2602.04, J, Perimeter and Slope Sediment Control Device.

Add as item L:

Perimeter and Slope Sediment Control Device.

Linear feet (meters) to the nearest foot (meter).

2602.05, A, 12, Perimeter and Slope Sediment Control Device.

Add as item 12:

Perimeter and Slope Sediment Control Device.

Per linear foot (meter) for length of device properly installed.

4169.12, Perimeter and Slope Sediment Control Device.

Add as a new article:

A. Wattles and Sediment Logs.

Wood excelsior or straw contained in a tube of ultraviolet (UV) degradable open weave fabric (synthetic netting). Install according to manufacturer's recommendations.

B. Filter Socks.

Continuous, tubular, knitted mesh netting with 3/8 inch (10 mm) opening fabricated using 5-mil (0.125 mm) thickness photodegradable HDPE and filled with a filter material consisting of compost from an approved source meeting Article 4169.08. Fill the sock by blowing the filter material into the tube with a special pneumatic blower truck or similar device. Hand filling will not be allowed. Install according to manufacturer's recommendations.

Reason for Revision: Newly developed method of silt control.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials		Item 8	
Submittal Date: October 20, 2010		Proposed Effective Date: April 2011			
Article No.: 4100.03		Other:			
Title: Measurement of Liquid Bituminous Materials					
Specification Committee Action: Approved as recommended.					
Deferred:	Not Approved:	Approved Date: 11/2/2010		Effective Date: 4/19/2011	
Specification Committee Approved Text: See Specification Section Recommended Text.					
Comments: No comments.					
Specification Section Recommended Text:					
4100.03, Measurement of Bituminous Materials.					
Replace the first paragraph of the Article:					
Liquid bituminous materials will be measured in U.S. standard gallons (liters) at a base temperature of 60°F (46 15°C). Volumes measured at other temperatures will be corrected to a base 60°F (46 15°C), using the appropriate Volume Correction Factor in Table 2 (Table 1 for metric units) of ASTM D 4311. Petroleum Measurement Tables, ASTM D 1250, Table 25, as follows:					
<ul style="list-style-type: none"> ● Group 0 for asphalt products having specific gravities of 0.9654 and higher. ● Group 1 for asphalt products having specific gravities from 0.8495 to 0.9653. ● Group 0 for tars of grades RT-1, RT-2, RT-3, and RT-4 or emulsions. 					
Comments:					
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .)					
Revise Article 4100.03					
Liquid bituminous materials will be measured in U.S. standard gallons (liters) at a base temperature of 60°F (4615°C). Volumes measured at other temperatures will be corrected to a base 60°F (4615°C), using the appropriate Volume Correction Factor in Table 2 (Table 1 for metric) of ASTM D 4311. Petroleum Measurement Tables, ASTM D 1250, Table 25, as follows:					
<ul style="list-style-type: none"> ● Group 0 for asphalt products having specific gravities of 0.9654 and higher. ● Group 1 for asphalt products having specific gravities from 0.8495 to 0.9653. ● Group 0 for tars of grades RT-1, RT-2, RT-3, and RT-4 or emulsions. 					
Reason for Revisions: The tables mentioned in ASTM D 1250 were moved to ASTM D 4311 a few years ago.					
County or City Input Needed (X one)			Yes		No X
Comments:					
Industry Input Needed (X one)			Yes		No X
Industry Notified:		Yes	No X	Industry Concurrence:	
				Yes	No X
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Tom Reis		Office: Specifications		Item 9	
Submittal Date: October 18, 2010		Proposed Effective Date: April 2011			
Article No.: 4185.15, A		Other:			
Title: Highway Lighting Materials					
Specification Committee Action: Approved as recommended.					
Deferred:	Not Approved:	Approved Date: 11/2/2010		Effective Date: 4/19/2011	
Specification Committee Approved Text: See Specification Section Recommended Text.					
<p>Comments: The District 6 Office asked what the term “symmetrical” means in this context. The Office of Traffic and Safety will report to the Specification Committee. Subsequent to the meeting Stanley Consultants provided an explanation that “symmetrical” pertains to “proper overcurrent protection calculations.”</p> <p>There will be some additional changes to road standards that were recommended by the Department’s lighting consulting firm, Stanley Consultants.</p>					
Specification Section Recommended Text:					
4185.15, A.					
Replace the Article:					
Rated for 240 volts and 480 volts, with minimum interrupting ratings of 25,000 amperes, symmetrical, at 240 volts, and 18,000 amperes, symmetrical, at 480 volts.					
Comments:					
Member’s Requested Change: (Do not use ‘Track Changes’, or ‘Mark-Up’. Use Strikeout and Highlight .)					
Reason for Revisions: Suggested by the Department’s statewide lighting consultant.					
County or City Input Needed (X one)		Yes		No X	
Comments:					
Industry Input Needed (X one)		Yes		No X	
Industry Notified:	Yes	No X	Industry Concurrence:	Yes	No X
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials		Item 10	
Submittal Date: October 20, 2010			Proposed Effective Date: December 2010		
Article No.:		Other: DS-09041, Warm Mix Asphalt			
Title:					
Specification Committee Action: Approved as recommended.					
Deferred:	Not Approved:	Approved Date: 11/2/2010		Effective Date: 2/15/2011	
Specification Committee Approved Text: See attached DS					
<p>Comments: The Office of Materials explained the verification testing can be done by mixing a batch of the Contractor's materials for testing or using mix that has been batched by the contractor. This way the Office of Materials can control how much work is required by the lab if there are many projects utilizing warm mix asphalt.</p> <p>The Office of Construction asked about using the term "verified" and how that relates to the Departments QA/QC verification testing. It is similar testing to our standard verification testing, so using the term "verified" is appropriate.</p>					
Specification Section Recommended Text: See revised DS.					
Comments:					
<p>Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)</p> <p>Revise Article 2303.02, D Add the following Article: 8. WMA is required optional for surface, intermediate, and base all mixtures. An HMA control section may be specified on the plans.</p> <p>Revise Article 2303.02, E Add the following Article: 5. WMA Technologies. Chemical additives, organic additives, or water injection systems approved by the District Materials Engineer Bituminous Engineer may be used at the rate established by the mixture design in the production of WMA. Once production of a bid item has begun with a WMA technology, continue its use throughout the remainder of the bid item's production unless otherwise approved by the District Materials Engineer.</p> <p>Revise Article DS-09041, Appendix A, F F. MIXTURE BATCHING, CURING & TESTING For WMA mixtures not utilizing a water-injection system, the WMA technology should be used in fabricating specimens in the mixture design phase. Mixture designs for mixtures utilizing a water-injection system may will be verified by after submitting raw materials to the Central Materials Laboratory. Methods for WMA specimen preparation are process specific.</p>					
Reason for Revisions: Almost all contractors have experience with WMA on state or commercial projects. The use of this DS will be more widespread in 2011. Bid prices would benefit if WMA was optional and not required. New technologies will be approved by the Bituminous Engineer. Foamed designs will be verified with our foaming unit in Ames.					
County or City Input Needed (X one)		Yes		No X	
Comments:					
Industry Input Needed (X one)		Yes		No X	
Industry Notified:	Yes X	No	Industry Concurrence:	Yes X	No
Comments:					



**DEVELOPMENTAL SPECIFICATIONS
FOR
WARM MIX ASPHALT**

**Effective Date
December 21, 2010**

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

If the Developmental Specifications (DS) for Asphalt Concrete Mixtures have been applied on the contract documents, amend the DS with the following modifications and additions.

2303.01, Description.

Add the following articles:

- C.** Warm Mix Asphalt (WMA) refers to asphalt concrete mixtures produced at temperatures approximately 50°F (28 °C) or more below those typically used in production of HMA. Temperature reductions may be achieved through approved additives or water injection systems. The goal with WMA is to produce mixtures with similar strength, durability, and performance characteristics as HMA using substantially reduced production temperatures.
- D.** Unless explicitly stated, produce and place WMA mixtures meeting the same requirements established for HMA mixtures.

2303.02, D, Hot Mix Asphalt Mixture.

Rename the article:

- D. Asphalt Concrete Mixture.**

Replace Article 6:

- 6.** Prepare gyratory asphalt concrete mixture designs for base, intermediate, and surface mixtures. Follow the procedure outlined in Appendix A of this specification. Submit a mixture design complying with Appendix A of this specification. Propose both a production and a compaction temperature between 215°F (102°C) and 280°F (138°C) for WMA mixture designs.

Add the following Article:

- 8.** WMA is required optional for surface, intermediate, and base all mixtures. An HMA control section may be specified on the plans.

2303.02, E, 2, Anti-strip Agent.

Add the following to Article a:

For all WMA mixtures, evaluate the moisture sensitivity of the proposed asphalt mixture design using the method described in Appendix B of this specification.

Replace Article c:

- c. A moisture susceptibility evaluation will not be required for base repair, patching, or temporary pavement for HMA mixtures.

Add the following Article:

- i. Optimize the dosage rate for an anti-stripping agent listed in Article DS-2303.02, E, 2, h, for all WMA mixtures using the method described in Appendix B of this specification. Determine the optimum dosage rate by comparing the dry strength of WMA specimens prepared with asphalt binder not containing the anti-strip additive to conditioned WMA specimens prepared with asphalt binder containing the anti-strip additive. If the tensile strength ratio without the anti-strip agent is improved by 5% or more with the agent at the optimum dosage rate, use the anti-stripping agent in the WMA mixture at the optimum rate. If the WMA technology manufacturer provides documentation indicating an anti stripping agent is a primary component of the formulation, the dosage rate of the WMA additive may be optimized in lieu of an additional anti-stripping agent.

2303.02, E, Other Materials.

Add the following Article:

5. WMA Technologies.

Chemical additives, organic additives, or water injection systems approved by the ~~District Materials Engineer~~ Bituminous Engineer may be used at the rate established by the mixture design in the production of WMA. Once production of a bid item has begun with a WMA technology, continue its use throughout the remainder of the bid item's production unless otherwise approved by the District Materials Engineer.

2303.03, B, Equipment.

Replace the first paragraph with the following:

Provide sufficient equipment of the various types required to produce, place, and compact each layer of asphalt concrete mixture as specified, such that the mixture is workable at the minimum placement and compaction temperature desired, regardless of storage or haul distance considerations.

Modify the asphalt mixing plant as required by the manufacturer when introducing a WMA technology. Plant modifications may include additional plant instrumentation, the installation of water injection systems and/or WMA additive delivery systems, tuning the plant burner and adjusting the flights in order to operate at lower production temperatures and/or reduced tonnage.

2303.03, C, 2, c, 5.

Replace the Article:

- 5) Place other fabrics with a heavy coat of asphalt binder at a rate of 0.20 to 0.25 gallons per square yard (0.9 to 1.1 L/m²). Use the same binder grade used in the asphalt concrete mixture. For binders containing a WMA technology, place at a temperature between 260°F and 315°F (127°C and 160°C), otherwise place at a temperature between 295°F and 315°F (145°C and 160°C).

2303.03, C, 3, d, 2.

Delete the Article:

- ~~2) Coating aids may be added with the Engineer's approval.~~

2303.03, C, 3, d, 4.

Replace the Article:

- 4) Adhere to the following temperature restrictions during production:
- a) Keep the production temperature of WMA mixtures between 215°F (102°C) and 280°F (138°C) until placed on the grade.
 - b) Do not produce WMA mixtures more than 10°F (5 °C) below the target temperature designated in the mixture design without the approval of the Engineer.
 - c) Keep the production temperature of HMA mixtures between 215°F (102°C) and 330°F (165°C) until placed on the grade.
 - d) Asphalt concrete mixtures not meeting these requirements will be rejected.

2303.03, C, 3, d, 7.

Delete the Article:

- ~~7) Ensure mixture temperature allows for the specified compaction and density to be attained. Do not discharge HMA into the paver hopper when its temperature is less than:~~
- ~~• 245°F (120°C) for a nominal layer thickness of 1 1/2 inches (40 mm) or less, or~~
 - ~~• 225°F (110°C) for a nominal layer thickness of more than 1 1/2 inches (40 mm).~~

2303.03, C, 4, c, 2.

Replace Tables 2303.03-1 and 2303.03-2:

Table 2303.03-1: Base and Intermediate Course Lifts of Asphalt Mixtures

Nominal Thickness - inches (mm)	Road Surface Temperature, °F (°C)
1 1/2 (40)	40 (4)
2 - 3 (50 - 80)	35 (2)
Over 3 (Over 80)	35 (2)

Table 2303.03-2: Surface Course Lifts of Asphalt Mixtures

Nominal Thickness - inches (mm)	Road Surface Temperature, °F (°C)
1 (30)	40 (4)
1 1/2 (40)	40 (4)
2 and greater (50 and greater)	40 (4)

2303.03, D, 3, b, 8.

Add the following to Article a:

Compact loose WMA field samples, transported to the laboratory, at 240°F (115°C).

Add the following Article:

- f) Evaluate reheating effects of WMA mixtures using the method described in Appendix C. Report results to the DME for information only.

Appendix A - METHOD OF DESIGN OF WARM MIX ASPHALT MIXTURES

Follow Materials I.M. 510 for the design of HMA mixtures. For WMA mixtures, supplement Materials I.M. 510 with the following:

PROCEDURE

A. MATERIALS SELECTION

1. WMA Process Selection

a) WMA Technology

Select the WMA process that will be used in consultation with the specifying agency and technical assistance personnel from the WMA suppliers. Consideration should be given to a number of factors including: (1) available performance data, (2) the cost of the warm mix additives, (3) planned production and compaction temperatures, (4) planned production rates, (5) plant capabilities, and (6) modifications required to successfully use the WMA process with available field and laboratory equipment.

b) WMA Temperatures

Determine the temperatures that will be used for plant mixing (production) and field compaction. Binder grade selection depends on the production temperature. See Table 1 for production temperatures below which the high temperature grade of the binder should be increased one level.

2. Binder Grade

Increase the high temperature performance grade based on the proposed production temperature. Increase the high temperature performance grade by one grade when the plant discharge temperature is less than that specified in Table 1.

Recycled Asphalt Materials: If more than 20% but less than 30% of the total binder contribution is from a recycled source, the designated high temperature binder grade will remain unchanged if the production temperature falls below that indicated in Table 1.

Table 1 - Production Temperatures below which the High Temperature Grade Should be Increased One Grade.

Specified PG High Temperature Grade	Aging Index (AI) ¹											
	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6
	Minimum WMA Mixing Temperature Not Requiring PG Grade Increase, °F											
52	<215	<215	<215	<215	<215	<215	220	220	225	225	230	230
58	<215	<215	<215	220	225	230	235	235	240	240	245	245
64	<215	<215	220	230	235	235	240	245	245	250	250	250
70	<215	220	230	240	245	245	250	255	255	260	260	260

Note: ¹ $AI = \frac{G^* / \sin \delta_{RTFOT}}{G^* / \sin \delta_{Bank}}$ at the high temperature performance grade temperature.

3. Additives

Use additives as required by the proposed WMA process or to obtain acceptable coating, workability, compactibility, and moisture susceptibility.

F. MIXTURE BATCHING, CURING & TESTING

For WMA mixtures not utilizing a water-injection system, the WMA technology should be used in fabricating specimens in the mixture design phase. Mixture designs for mixtures utilizing a water-injection system may will be verified by after submitting raw materials to the Central Materials Laboratory. Methods for WMA specimen preparation are process specific. Consult the manufacturer for detailed WMA specimen fabrication procedures or use the same procedures in Materials I.M. 510 for batching, curing and testing of WMA mixtures with the following exceptions:

- Heat the combined aggregate batch and binder containing the WMA technology (at the dosage recommended by the manufacturer) to the proposed production temperature ± 5°F (± 3°C). Verify temperature using a thermometer in the pan. The mixing bowl and utensils shall also be heated before

mixing operations begin. Always keep the mixing bowl buttered.

10. Cure all samples for 2 hours at the proposed production temperature. One hour into curing, all samples are removed, thoroughly stirred and placed back into the oven for remainder of curing time.
11. Place approximately 4800 g of material into the mold for gyratory specimens. Compact specimens at the proposed production temperature per Materials I.M. 325G.

G. MIXTURE PERFORMANCE EVALUATION

In addition to the requirements in Materials I.M. 510, check all WMA mixtures for moisture susceptibility using the method in Appendix B.

DOCUMENTATION

Report proposed production temperature, compaction temperature, WMA technology, additional equipment requirements from the manufacturer, manufacturer name, proposed dosage rate, and any manufacturer recommendations on Form #820956.

Appendix B - METHOD OF TEST FOR DETERMINING THE MOISTURE SUSCEPTIBILITY OF WARM MIX ASPHALT MIXTURES

SCOPE

This test method is intended to determine the moisture susceptibility of asphalt paving mixtures by measuring the tensile strength ratio (TSR). The apparatus and procedures are identical with those specified in AASHTO T 283-07 with the following variations.

1. When performing moisture sensitivity testing in the WMA mixture design phase, the WMA technology and field production temperatures should be used in fabricating specimens as described in Appendix A of this specification. Methods for WMA specimen preparation are process specific. Consult the manufacturer for detailed specimen fabrication procedures. Specimens for WMA mixtures utilizing a water-injection system may be fabricated without the WMA technology. (Note: Indirect tensile strengths for lab specimens fabricated without the WMA technology may be significantly different than those for specimens fabricated from plant-produced mixture containing the WMA technology. Acceptance is based on plant-produced mixture)
2. 150 mm diameter gyratory compacted specimens will be used unless it is determined that the saturation of the conditioned specimens does not penetrate completely to the center of the specimen or if the sample size is insufficient to provide enough material to fabricate 150 mm diameter specimens, in which cases 100 mm diameter gyratory compacted specimens may be used.
3. Condition the mixture in a flat shallow pan at an even thickness of 21-22 kg/m³ in a forced draft oven at the proposed compaction temperature for 2 hours. Stir the mixture once after the first hour.

Note – Do not use the conditioning procedure in AASHTO T 283 or AASHTO R 30 for WMA

4. Compact test specimens to 7.0 ± 0.5 percent air voids in accordance with AASHTO T 312.
5. Group, condition and test the specimens in accordance with AASHTO T 283.

REPORT

Determine and report the indirect tensile strengths and TSR as the ratio of the wet strength of the conditioned WMA specimens to the unconditioned dry strength of WMA specimens

Appendix C –REHEAT EVALUATION OF WARM MIX ASPHALT MIXTURES

The following procedure is adapted from Materials I.M. 511 Appendix B. This procedure is intended to be used for information only. In the case of dispute resolution, follow Materials I.M. 511 Appendix B, and use the field compaction temperature when heating is required for testing.

The Contractor's QMA laboratory technician shall split the sample selected for correlation. The split will provide material for 3 individual maximum specific gravity, G_{mm} , test samples and material for 3 sets of laboratory density, G_{mb} , specimens.

The Contractor's technician will split and retain sufficient material for 2 G_{mm} test samples and 2 sets of laboratory density specimens. The remainder of the field sample will be submitted to the DOT laboratory. From this portion the DOT laboratory will split and test an additional G_{mm} sample and an additional set of laboratory density specimens, after reheating.

Immediately after splitting, the Contractor's technician will return one set of laboratory density samples to the oven and heat to 240°F (115°C). Once this temperature is reached, this set is removed from the oven, compacted as per Materials I.M. 325 or Materials I.M. 325G, cooled to ambient temperature and G_{mb} determined. The second set of samples is cooled to ambient temperature, reheated to 240°F (115°C) then compacted as per Materials I.M. 325 or Materials I.M. 325G, cooled to ambient temperature and G_{mb} determined. This dual testing is intended to indicate the differences in test results, which can be expected, between samples tested on the original heat of the mixture and those tested at a later time (hot-to-cold testing).

The Contractor's technician will cool and separate both G_{mm} samples. The Contractor's technician will test one G_{mm} sample. The second G_{mm} sample will be sealed in a plastic bag and submitted to the appropriate DOT laboratory for testing. The DOT laboratory will test the sample without any significant reheating (not more than 5 minute's oven reheating to facilitate breaking up sample).

Use the following outline for testing. All tests noted in this outline must be performed in accordance with the applicable Materials I.M.

1. Contractor Testing Responsibilities

A. Obtain field sample and split to obtain 2 sets of laboratory density, G_{mb} , specimens and 2 Maximum specific gravity, G_{mm} , specimens and submit the remainder of field sample to DOT laboratory for testing.

B. Bulk Density Testing

- 1) Set #1 – Immediately after splitting, return specimens to the oven, reheat to 240°F (115°C), compact specimens as per Materials I.M. 325 or Materials I.M. 325G, cool to ambient temperature and test for density.
- 2) Set #2 – Cool to ambient temperature, return to oven, reheat to 240°F (115°C), compact as per Materials I.M. 325 or Materials I.M. 325G, cool to ambient temperature and test for density.
- 3) Compare values obtained in #1 and #2 to determine possible reheat factor.

C. Maximum Density Testing

Sample #1 – Cool sample and perform Rice Test.

Sample #2 – Cool sample, place in plastic bag and submit to the DOT laboratory for testing.

D. Submit remainder of field sample to DOT laboratory for testing.

2. DOT Laboratory Testing Responsibilities

A. Bulk Density Testing

- 1) From the field sample supplied by the Contractor, split one set of G_{mb} specimens, place in oven, heat to 240°F (115°C), compact as per Materials I.M. 325 or Materials I.M. 325G, cool to ambient temperature and test for density.

B. Maximum Density Testing

- 1) From the field sample supplied by the Contractor, split one G_{mm} specimen and perform Rice Test.
 - 2) Test the G_{mm} sample supplied by the Contractor.
 - 3) Compare values obtained in #1 and #2 to determine possible deviation in G_{mm} results that might occur between the Contractor's split G_{mm} sample and the DOT G_{mm} sample split from a field sample.
3. Document results and submit to the DME.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe / Kevin Merryman		Office: Construction	Item 11
Submittal Date: September 30, 2010		Proposed Effective Date: December 2010 letting	
Article No.: Title:		Other: DS for PCC Paving 3-D Machine Control	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 1/19/2011
Specification Committee Approved Text: See attached Draft DS for PCC Paving 3-D Machine Control.			
<p>Comments: The Office of Construction researched how machine control grading has been bid. Originally, machine control grading was bid as alternates, Construction Survey only versus Construction Survey and Machine Control Grading. In more recent lettings, alternates have not been bid, so the Contractor would bid \$0 for Machine Control Grading if they will not be using the technology. The Office of Construction would like to see both machine control grading and machine control paving bid similarly. The preference would be to bid alternates so it is clearer to all involved how and what to bid. The only issue with bidding alternates is if a contractor bid intending to use machine control and then after the bid could not for some reason, the Engineer would need to either pay the bid price for machine control even though the contractor was not using this technology, or renegotiate the price for Construction Survey since the requirements would differ without the machine control.</p> <p>The Office of Contracts asked how the designer knows when to include alternates on the plan for machine control. Kevin Merryman decides during preliminary plan review which projects this will apply to and notifies the designer to add the alternate bid items.</p> <p>The Office of Design will include language in the Design Manual identifying that alternates should be used for both machine control grading and paving.</p> <p>The Office of Construction would like to assign this specification to a project in the January letting, so it will be effective January 19, 2011.</p>			
Specification Section Recommended Text: See attached Draft DS for PCC Paving 3-D Machine Control.			
<p>Comments: The following comments are from the October Specifications Committee meeting:</p> <p>Kevin Merryman will be the controller of this DS.</p> <p>This specification was developed because at least two paving companies doing work in Iowa currently have this technology.</p> <p>Initially, the Department will not assign this specification to any project that does not include the Construction Survey bid item. It will primarily be assigned to QM-C and PCC overlay projects.</p> <p>There was much discussion on how this item will be bid. The Office of Contracts suggested the work described in the DS be made incidental to Construction Survey. Another option would be to include alternates on the proposal form. One alternate would include Construction Survey and PCC Paving 3-D Machine Control and the other alternate would only be Construction Survey. This is how Machine Control Grading was handled, initially. The final option would be to include a bid item for PCC Paving 3-D Machine Control and have the contractor bid \$0 for this item if they will be using traditional methods.</p> <p>Initially it is intended this specification will not be assigned, but will be available for the Contractors to add at their option by change order.</p> <p>At a meeting with industry, consultant surveyors requested the Department include a bid item for this work so the surveyors would know how to bid the work. Apparently, there had been miscommunication between</p>			

surveyors and contractors on what work the surveyors were bidding on. This item will be reviewed by the individual offices prior to the next Specification Committee meeting.					
Member's Requested Change (Redline/Strikeout): See attached DS.					
Reason for Revision: Several PCC contractors have purchased 3-D machine control systems for paving. Current specifications do not permit use of 3-D machine control. A task group, including industry, County, and Department representatives, was organized to write a specification to allow use of 3-D machine control technology for PCC paving. The DS is the result of the task group's efforts.					
County or City Input Needed (X one)			Yes X		No
Comments: A county representative was involved in the development of the specification.					
Industry Input Needed (X one)			Yes X		No
Industry Notified:	Yes X	No	Industry Concurrence:	Yes X	No
Comments: Industry representatives were involved in the development of the specification.					



Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS FOR PCC PAVING 3-D MACHINE CONTROL

Effective Date
January 19, 2011

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

09XXX.01 DESCRIPTION.

- A. This specification contains requirements for slip formed PCC paving using 3-D machine control techniques. Use this specification in conjunction with Sections 2301 and 2526 of the Standard Specifications.
- B. The Contractor may use equipment controlled with a PCC Paving 3-D Machine Control System in the construction of the subgrade, subbase, or PCC pavement.
- C. Prior to letting, the Contracting Authority will provide available electronic surface models of the roadway design in common file formats. When such models are provided, the Contractor will be responsible for manipulating the provided file formats to make them compatible with the respective equipment and systems being used.
- D. The Contractor may use any type of PCC Paving 3-D Machine Control equipment and system resulting in meeting the elevation, cross slope, thickness, and smoothness specification requirements.

09XXX.02 EQUIPMENT.

Provide equipment to accomplish PCC Paving 3-D Machine Control. Use equipment that generates results meeting quality requirements of the Standard Specifications.

09XXX.03 CONSTRUCTION.

A. Contracting Authority Responsibilities.

- 1. For new construction, the Engineer will set the initial horizontal and vertical control points.
- 2. For reconstruction or PCC overlays, the Engineer will furnish information on existing horizontal and vertical control points.
- 3. The Engineer will review and approve the proposed surface model within two weeks following receipt of the model.

B. Contractor Responsibilities.

- 1. When an electronic surface model is not furnished by the Contracting Authority, develop an electronic model providing the minimum design depth of pavement. For PCC overlays,

- compute an estimated quantity of overlay concrete based on pavement profiles prior to start of paving and the electronic model. This quantity will serve as the estimated concrete quantity for the project and must be approved by the Engineer prior to start of construction.
2. Provide a digital terrain model (DTM) of the subgrade surface from top of shoulder to top of shoulder for construction grading.
 3. Provide an electronic file such as a D45 file, or equivalent, identifying x, y, and z coordinates for shoulder and pavement edges as well as the pavement centerline based on project alignments and elevations.
 4. Make available to the Engineer a rover for use during paving operations. Provide training on the use of the rover to allow the inspector to make random checks of subgrade, subbase, and pavement station locations and surface elevations. The rover will remain property of the Contractor.
 5. When total stations are used for the PCC Paving 3-D Machine Control system, set additional control points at maximum 500 foot (150 m) intervals on each side of the pavement. Furnish x,y,z coordinates and station offset information for each point.
 6. Set paving hubs with cut/fill to finish pavement elevation at A, B, C, and D points along superelevated curve transitions and at station equation locations. Additional paving hubs will not be required for mainline pavement.
 7. Prior to start of construction, provide the Engineer a maximum of 8 hours training on PCC Paving 3-D Machine Control equipment and system.
 8. Submit required information to the Engineer for approval at least three weeks prior to start of work.
 9. If necessary, check and recalibrate PCC Paving 3-D Machine Control system daily prior to start of work. Include equipment type, control software manufacturer, and software version in the submittal.

09XXX.04 METHOD OF MEASUREMENT.

None.

09XXX.05 BASIS OF PAYMENT.

- A. Payment for PCC Paving 3-D Machine Control will be lump sum contract price.
- B. Payment is full compensation for equipment, preparation of electronic files, survey, training, and all other items required for using PCC Paving 3-D Machine Control System.
- C. Additional payment or contract period extensions will not be made for:
 1. Delays due to late submittal of electronic files,
 2. Placement of paving hubs and stringline due to failure of the PCC Paving 3-D Machine Control System,
 3. Rework resulting from failure or errors in using a PCC Paving 3-D Machine Control System, or
 4. Additional quantities placed resulting from using a PCC Paving 3-D Machine Control System.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials		Item 12	
Submittal Date: October 20, 2010			Proposed Effective Date: December 2010		
Article No.: Title:			Other: DS-09038, Recycled Asphalt Shingles		
Specification Committee Action: Approved with changes.					
Deferred:		Not Approved:		Approved Date: 11/2/2010	
				Effective Date: 4/19/2011	
Specification Committee Approved Text: See attached Draft DS for Recycled Asphalt Shingles (RAS).					
<p>Comments: The Office of Contracts asked when this specification will be assigned. The Office of Materials will decide what projects to assign this specification to. It will not be used for Interstate projects. The proximity of RAS sources will be considered when deciding what projects to assign the specification to.</p> <p>The Office of Contracts asked about applying this specification post letting at the Contractor's option. It will only be applied by Value Engineering Proposal. There would have to be an economic benefit to the Contracting Authority.</p>					
Specification Section Recommended Text: See attached Draft DS for Recycled Asphalt Shingles (RAS).					
Comments:					
<p>Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)</p> <p>Revise Article DS-09038, F, 2</p> <p>2. Use between 2% and Up to 5% RAS by weight of total aggregate may be used in an asphalt mixture. Consider the percentage of RAS used part of the maximum allowable RAP percentage.</p> <p>Revise Article DS-09038, F, 3</p> <p>3. RAS shall be certified come from an approved supplier designated in Appendix D. Material processed prior to DOT source approval will not be certified.</p> <p>Other changes are to appendices, which will become IMs. Operational items related to sampling and testing logistics, approval process, etc. have minor modifications. The full DS is attached.</p>					
Reason for Revisions: The DS will be applied on a more widespread basis in the future. It is anticipated that the DS will become part of the GS by October 2011. We anticipate competitive bid prices if RAS is optional rather than required.					
County or City Input Needed (X one)			Yes		No X
Comments:					
Industry Input Needed (X one)			Yes		No X
Industry Notified:		Yes	No X	Industry Concurrence:	
				Yes	No X
Comments:					



**DEVELOPMENTAL SPECIFICATIONS
FOR
RECYCLED ASPHALT SHINGLES**

**Effective Date
December 21, 2010**

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Add the following to Article 2303.02, Materials:

F. Recycled Asphalt Shingles (RAS)

1. Pre-consumer or post-consumer shingles that have been processed, sized, and ready for incorporation into an asphalt mixture constitute RAS material. Other than explicitly stated in this subsection and Appendix A, use RAS according to the same requirements as prescribed for RAP material. Equipment used to incorporate RAS material shall comply with requirements of Article 2001.22, K, 1, g.
2. ~~Use between 2% and~~ Up to 5% RAS by weight of total aggregate may be used in an asphalt mixture. Consider the percentage of RAS used part of the maximum allowable RAP percentage.
3. RAS shall ~~come~~ be certified from an approved supplier designated in Appendix D. ~~Material processed prior to source approval by the Department will not be certified.~~

Add the following to Article 2303.04, Method of Measurement:

I. Recycled Asphalt Shingles (RAS)

Two-thirds (67%) of the asphalt binder from RAS which is incorporated into the mixture will be included in the quantity of asphalt binder used.

Replace item 2 of Article 2303.05, B, Asphalt Binder:

2. Payment for asphalt binder will be for new asphalt binder, the asphalt binder in the RAP which is incorporated in the mixture, and two-thirds (67%) of the asphalt binder from RAS which is incorporated into the mixture. The quantity of asphalt binder in RAP, which is incorporated into the mix, will be calculated in tons (megagrams) of asphalt binder in the RAP. This will be based on the actual asphalt binder content determined for the mix design from the results of the Engineer's extraction test.

Appendix A – Instructions for RAS in HMA Asphalt Mixtures

GENERAL

This Appendix describes requirements for processing, storing, documenting, and sampling & testing of RAS intended for use in asphalt mixtures.

All notifications and documentation shall be submitted to the District Materials Engineer (DME) based on the District responsible for the location of the initial RAS stockpile.

PROCESSING

End users of RAS which also receive raw, unprocessed shingles and process the material for incorporation into an asphalt mixture, shall be considered a shingle Supplier and must adhere to Appendix C.

STORAGE

Stockpiles shall be placed on a base with adequate drainage sufficient to prevent contamination.

Separately stockpile pre-consumer RAS from post-consumer (tear-off) RAS. RAS may be pre-blended with RAP under the direction of the Engineer. Notify the Engineer and District Materials Engineer DME 48 hours prior to blending RAS materials with other materials or adding to a RAS stockpile. Equipment must be calibrated to ensure proper proportioning of blended piles. The Engineer may require verification testing for asphalt content, gradation, aggregate specific gravity, aggregate absorption, and fine aggregate angularity before the pile may be used.

All RAS stockpiles shall be identified by maps of stockpile areas and signs placed in or near each stockpile.

STOCKPILE DOCUMENTATION

The following documentation is required for owners of stockpiled RAS:

- Form 82009ras (see Appendix B) is completed by the stockpile owner and a copy is forwarded to the District Materials Engineer DME within 10 calendar days of completing the stockpile.
- Any special handling, treatment or conditions of the RAS should be described on this form.
- A record of addition and consumption of the RAS stockpile should be documented on this form.
- Maps shall provide details that depict the stockpile site, including adjacent stockpiles of RAP or aggregates, permanent plant equipment, and landmarks.
- Maps and signs shall identify the stockpile by RAP Identification Number.

The District Materials Engineer DME will review forms for accuracy. Portions of the form including assigning the stockpile identification number, average values for extracted aggregate gradation, aggregate bulk specific gravity, aggregate absorption and asphalt binder content will be completed by the District Materials Engineer DME.

Notify the District Materials Engineer DME at least 48 hours before relocating or reprocessing a RAS stockpile for future use (not intended for a specific project). The notification shall include the estimated quantity of RAS being relocated or reprocessed and the new location of the stockpile. Relocation of RAS shall be reported on the appropriate Form (820009ras) and submitted to the District Materials Engineer DME within 10 calendar days of completing the relocation. Reprocessing a RAS stockpile may require additional sampling, testing, and a new Form (820009ras) with reassignment of a RAS Identification Number.

Before January 1st of each year, the Contractor shall update Form 820009ras on the status of each RAS stockpile. Report the estimated quantity of RAS removed for the construction season completed and the available RAS in each stockpile for future use.

SAMPLING AND TESTING

DOT personnel may only sample and test RAS material from a pile that has been certified by an approved supplier.

Mix Design

When RAS is to be used on an existing contract, the DOT will perform mix design testing on samples from the certified stockpile dedicated to the project at the plant. Samples may also be collected at an in-state source. For out-of-state sources, the DME may approve mix design sampling and testing to be coordinated by the Contractor and Supplier at a qualified lab for preliminary information. Mix designs may then be given conditional approval pending DOT results. When the Contractor retains possession of the RAS, the DOT will sample and test. DOT results shall be available prior to start-up. Adjustments to the mix design may be required.

When mix design development needs to be expedited for an active DOT contract and the Supplier has not had sufficient time to certify the pile's quality, extraction samples may be taken by the District directly at the Supplier's site provided the material is certified free of asbestos containing materials (ACM). Provide a certification letter to the DME using guidelines in Appendix I. The Central lab will run extraction and material quality (gradation and deleterious content) testing on the sample. In the event of a failing quality test, the District may sample and test (gradation and deleterious) again after the Supplier has certified the material quality.

A certified Level I Aggregate Technician shall obtain the samples. RAS shall be sampled using methods similar to those for fine aggregate. Samples for mix design testing shall be obtained from at least 3 locations. A sampling plan shall be developed by the Contractor and approved by the District Materials Engineer DME prior to sampling.

Obtain sufficient material for contractor mix design testing and owner agency extraction testing as recommended in Materials I.M. 510. Samples shall be witnessed and secured. A representative 30 pound (15 kg) sample split from the total sample shall be delivered to the District Materials Laboratory for extraction testing. Results of the extraction test will be provided to the Contractor within 4 weeks of sample delivery.

Include extracted asphalt content, and dry RAS gradation, aggregate specific gravity, fine aggregate angularity and absorption of the RAS material in testing.

In lieu of a sieve analysis, the following gradation may be assumed for the RAS aggregate:

Shingle Aggregate Gradation	
Sieve Size	Percent Passing by Weight
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95
No. 8 (2.36 mm)	85
No. 16 (1.18 mm)	70
No. 30 (600 µm)	50
No. 50 (300 µm)	45
No. 100 (150 µm)	35
No. 200 (75 µm)	25

Appendix C –Recycled Asphalt Shingle Suppliers

DEFINITIONS

Deleterious Material:	Paper, plastics, wood, metals, glass, rubber, soil, brick, tars, and any other material not part of the asphalt shingle.
End User:	One who incorporates processed recycled asphalt shingles into an asphalt mixture.
RAS:	Pre-consumer or post-consumer shingles that have been processed, sized, and ready for incorporation into an asphalt mixture.
Source:	A Supplier's operational site
Supplier:	One who collects, processes, or distributes pre-consumer or post-consumer shingles for incorporation into an asphalt mixture.

SCOPE

This ~~IM~~ appendix describes requirements for the collection, sorting, sizing, processing, and stockpile management of raw and recycled asphalt shingles (RAS). Secure DOT approval for each operational site (source) before collecting, processing, and furnishing RAS to the end user. Approved suppliers and sources are listed in Appendix D.

APPLICATION FOR APPROVAL

~~Submit applications for approval in writing, to the DOT Office of Materials in Ames. Suppliers seeking source approvals may submit a written application and quality control plan to the DME in each district of operation. A sample application is provided in Appendix E. Suppliers within the state of Iowa who are not the End User of the RAS material shall apply for a permit with the Iowa DNR Land Quality Bureau for each source. Submit proof of securing a sanitary disposal project permit or documentation from the IDNR that a permit is not needed. Contact the Iowa DNR Land Quality Bureau to determine if a sanitary disposal project permit is needed. End users may not collect or process raw shingle material at portable facilities. In addition to the requirements stated in this IM appendix, all suppliers (both in-state and out-of-state) shall comply with local, state, and federal environmental regulations, and follow IDNR asbestos testing protocols. Once the Office of Materials receives notification that the required permits have been secured, the appropriate District Materials Office may recommend the approval when assured that the supplier has met all DOT qualifications. The Office of Materials will issue a letter of approval. This letter shall serve as a supplier's approval until Appendix D can be updated.~~

~~Suppliers seeking source approvals may submit a written application to the District Materials Engineer (DME) in each district of operation. A sample application is provided in Appendix E.~~

CERTIFICATION REQUIREMENTS

Certified RAS shall meet the following requirements:

- A. Pre-processing
 1. Remove all visible materials not part of the shingle, including but not limited to ~~extra~~ wood, paper, metals, rubber, and plastics prior to processing. Unroll or remove shingles found in rolls prior to processing.
 2. ~~Follow IDNR protocols for identifying, removing, and reporting~~ Identify and reject loads with Asbestos Containing Materials (ACM).
- B. Processing Operation
Process the raw shingles by ambient grinding or granulating methods such that the following gradation is met:

Sieve Size	Minimum % Passing (by weight)
1/2 inch (12.5 mm)	100
3/8 inch (9.5 mm)	98
#4 (4.75 mm)	90

Separately process pre-consumer and post-consumer raw material.

Ensure the RAS material does not contain more than 1.5% deleterious content by weight. Notify the Engineer 48 hours prior to processing. **Collect samples for quality control testing to be performed by a qualified lab.**

C. Storage

Separately construct RAS stockpiles based on similarities in source (pre-consumer or post-consumer) and place them on a base with adequate drainage to prevent contamination. Assign each stockpile a unique identification number. Document the size of each stockpile by weight. Notify the Engineer 48 hours prior to adding to or moving an existing stockpile. Properly remove discarded non-shingle material from the site.

D. Stockpile Uniformity

Take proper measures to ensure a uniform stockpile.

Approval to deliver certified material may be withdrawn for inadequate compliance with these requirements.

QUALITY CONTROL PROGRAM

The Supplier has the overall responsibility of certifying that material being placed in a certified stockpile is produced under and conforms to a Quality Control (QC) Program. The DOT, through its monitoring activities (sampling/testing, visual observation, etc.), will verify the continued compliance to the program. Any certified stockpile must meet the designated quality before shipment. Intentional shipment of untested or out of specification material will constitute grounds for immediate rejection of material and placement of the source and/or the Supplier on conditional status. Develop a QC program document that contains the following aspects:

1. Knowledge of Current Specifications

Maintain up-to-date knowledge of the specifications that apply to RAS products. Maintain copies of the current Standard Specifications, all applicable Supplemental Specifications and all applicable Material I.M.s at the testing lab. Be aware of any Special Provisions, which change current RAS specifications. The supplier shall be responsible for providing these up-to-date publications to their QC representative.

2. RAS Production Log

Maintain a production log when operating under the QC program. This production log shall contain detailed information on test samples that include date, time, stockpile identification number, **asbestos testing results**, QC representative information, quantity, gradation results, deleterious content results, moisture content, pass/fail results, corrective actions, etc. Keep the log at a designated location and readily available to the DOT representative for review.

3. Visual Inspection

Visually inspect the shingle collection, sorting, sizing, and processing operations on a frequent basis. Visual inspection can be defined as observing the processing area, as well as the condition of the RAS in the flow stream or stockpiles. Observe the overall operation to detect **ACMs as well as** oversized and deleterious materials that are detrimental to the quality of the product. Visual inspection does not replace testing, but enhances the quality control program.

4. Production

A. Testing and Reporting

Perform and report testing for deleterious content, gradation, and moisture content of the RAS material. The Engineer may obtain a split sample to verify QC results.

Testing for RAS Certification

The supplier shall be responsible for performing and reporting the following tests for each sample. The testing laboratory shall be approved by the Engineer.

1. Deleterious Content

Determine the percentage of deleterious material retained on the #4 (4.75 mm) sieve. Pick, remove, and weigh the waste material from by weight of a 200 500-700 g sample. Calculate deleterious content as follows:

Where P = percentage of deleterious material
C = Mass of deleterious material, g
W = Mass of test sample, g

No sample shall exceed 1.5% deleterious content.

2. RAS Particle Distribution

Determine the RAS gradation in accordance with Materials I.M. 302. Dry the sample in an oven at 90°F for 70 minutes. Shake a 500 to 700 g sample over the 1/2 inch, 3/8 inch, and #4 (12.5 mm, 9.5 mm, 4.75 mm) sieves. At least 90% of the samples shall meet gradation requirements described above for the material to be certified (i.e. if 2 out of 3 samples meet requirements, the material would only be 67% compliant and thus would be rejected).

3. Determine the percentage of moisture by weight within 48 hours of delivery in accordance with Appendix H. Results shall be logged and provided to the end user.

4. Certify the product does not contain ACMs.

Testing for Mix Design

Additional information on the RAS material is required before it may be used in an asphalt mixture. When the end user has an existing contract for a DOT project, the District may sample from a pile dedicated to the project at an in-state supplier's location. ~~The Supplier may submit samples for additional testing on behalf of the End User to be performed by the Central Materials Laboratory in accordance with Appendix A.~~

B. Sampling

A minimum of 3 random samples or 1 per 1000 tons (MG), whichever is greater, of each stockpile shall be tested during its construction. Collect a minimum of 20 pounds (9 kg) of RAS per sample. Obtain samples for moisture content within 48 hours of delivery from a cross section of the pile material to be delivered. A certified Level I Aggregate Technician shall obtain the samples.

Test results shall be known before delivery to the end user. All test results will be available at a designated location within 24 hours of sampling when the material is being placed into a certified stockpile.

5. Delivery

Ensure delivery of RAS material from proper stockpiles by verifying the stockpile identification number and associated test results match.

6. Quality Control Structure

In order to ensure quality as a priority, the source QC personnel shall have a line of communication directly to their management, as well as their production operation.

MONITORING ACTIVITIES

Monitoring activities of Suppliers, including inspection of test reports and shipping records will be conducted by the appropriate District Materials Engineer. The Engineer may obtain samples from the source or End

User's stockpile to verify compliance to quality standards. Noncompliant verification results may require re-sampling and re-testing.

All District Materials Office monitoring activities shall be reported to the Central Materials Office.

DOCUMENTATION

Documentation shall be required to establish a chain of possession of raw shingle and processed RAS materials. Make all forms available to the DOT and Iowa DNR upon request.

A. Transactions of raw, unprocessed shingles

Keep on file a signed Form 820010a (See Appendix F) for each accepted load of unprocessed raw shingles. Loads of unknown origin may not be processed and added to certified piles for use on DOT projects.

B. Transactions of processed RAS

Keep on file a signed Form 820010b (See Appendix G) for each load of RAS delivered to the end user to certify compliance with DOT specifications. Suppliers who are also end users should complete this form. Copies of this form shall be furnished to the Engineer and end user at the time of delivery.

C. RAS Stockpile Inventory

The owner of the stockpile shall document accumulation, consumption, and current testing results for each RAS stockpile in Form 820009ras (See Appendix B). A copy of this form shall be sent to the Engineer within 48 hours each time stockpile testing is completed. Before January 1st of each year, the owner shall update report form 82009ras on the status of each RAS stockpile. In addition, the owner shall provide annually, an electronic tabulated spreadsheet containing load origin information compiled from Form 820010a.

ACCEPTANCE

Properly identified and certified materials may be incorporated into a project. Final acceptance will be based on the certifications and the results of tests on samples secured in accordance with Materials I.M. 204 or in accordance with special requirements when specified. Verification samples with noncompliant test results may require additional tests. Continued approval of a source will be based on the following:

- A. Ability to consistently supply material meeting specifications
- B. Maintenance of required records
- C. Proper documentation of shipments
- D. Proper handling and storage of the material

Appendix D – Approved List of RAS Suppliers and Sources

Dem-Con	Shakopee, MN
*Eastern Iowa Roofing	Marion, IA
Metro Waste Authority	Des Moines, IA
R2R Recycling, LLC	Cedar Rapids, IA Newton, IA West Des Moines, IA Omaha, NE
Waste Commission of Scott County	Buffalo, IA

*The following Suppliers has have been given conditional approval pending completion of the application process:

Appendix E – RAS SOURCE APPROVAL APPLICATION

Supplier Name _____
Phone _____
Address _____

(IF MORE THAN ONE SOURCE PLEASE ATTACH LIST AND AREA COVERED.)

- ~~1. Have the appropriate permits been obtained from the Iowa DNR Land Quality Bureau? (Yes or No) If No, explain.~~ _____
- ~~2. Please submit proof of securing a sanitary disposal project permit or documentation from the IDNR that a permit is not needed.~~ _____
- 31. What testing laboratory capable of determining gradation, deleterious content, and moisture content will be used?
- 42. Are copies of current applicable specifications, testing Material I.M.s and source information data available at the respective sources or testing facilities? (Yes or No) If No, explain.
- 53. Is a production log maintained on a daily basis and available for inspection? (Yes or No) If No, explain.
- 64. Who (position) is responsible for production notification to the District Materials Engineer?
- 75. Which company representative (position) is normally responsible for daily overall Quality Control processes at the source?
- 86. Describe the certified stockpile identification system in place at each source (Map, signing, etc.)
- 97. Please attach a detailed summary of your Quality Control Program and Iowa DNR plans for identifying and removing asbestos testing protocol implementation plans containing materials.
- 108. Please attach a flow chart of your current Quality Control structure (Include names, addresses, phone numbers of appropriate management personnel, chain of command, etc., for problem resolution).

Indicate the District(s) for which you are seeking approval.

1 2 3 4 5 6

AUTHORIZED SIGNATURE _____ DATE _____

DME RECOMMENDATIONS _____

DME SIGNATURE _____ DATE _____

APPROVAL (YES or NO) REMARKS _____

MATLS. ENGINEER SIGNATURE _____ DATE _____

Appendix F – Unprocessed Asphalt Shingles Delivery Certification Form (Form 820010a)

DELIVERING ENTITY	
Company Name	
Address	
Phone	
Contact Name	
Address of Shingle Source	
License Plate Number	

ACCEPTING ENTITY	
Company Name	
Address	
Phone	
Contact Name	
*IDNR Permit #	

*If required

- Post-consumer**
 Pre-consumer
(Check One)

We undersigned certify the following:

- _____ tons of whole, unprocessed asphalt shingles have been delivered for processing. *(Report number of tons)*
- The delivered material is from a NESHAP exempt structure or documentation stating the material does not contain asbestos has been submitted. The material has not been in contact with hazardous wastes and consists of asphalt shingles and normal roofing debris only.
- Delivered asphalt shingles have been tested or inspected ~~in accordance with Iowa DNR protocol for asbestos-containing materials (ACM)~~ by _____, (provide trainee name and certification number) who has been trained to identify ~~asbestos-containing materials (ACM)~~ by _____ (provide training program name). Suspected ACM have been rejected.

- Accept**
 Reject

Comments:

 Delivering Entity (*signature*)

 Date

 Accepting Entity (*signature*)

 Date

Appendix G – Processed Recycled Asphalt Shingles Certification Form (Form 820010b)

RECYCLED ASPHALT SHINGLE SUPPLIER ⁽¹⁾	
Company Name	
Address	
Phone	
Contact Name	
IDNR Permit # (if required)	
RAS Stockpile ID	

(1) Required for non-End Users

END USER	
Company Name	
Address	
Phone	
Contact Name	
RAS Stockpile ID ⁽²⁾	

(2) Required if Supplier is also the End User

Pre-consumer

Post-consumer

(Check One)

We undersigned certify the following:

- _____ tons of asphalt shingles have been processed, sized (100% by weight passing the 1/2 inch sieve, 98% by weight passing the 3/8 inch sieve, and 90% by weight passing the #4 sieve), and delivered. *(Report number of tons)*
- All visible materials not part of the shingle, including but not limited to **extra** wood, paper, metals, **glass, rubber, soil, brick, tars,** and plastics were removed prior to processing.
- The material does not contain more than 1.5% deleterious material by weight.
Note: Deleterious material consists of paper, plastics, wood, metal, **glass, rubber, soil, brick, tars,** and any other material not part of the asphalt shingles.
- The moisture content (%) of the load is _____.
- The material meets all requirements of **Materials IM 506 DS-09XXX**.

Asphalt Shingle Supplier (*authorized signature*)

Date

End User (*authorized signature*)

Date

**Appendix H– DETERMINING THE MOISTURE CONTENT
OF AGGREGATE AND RECYCLED MATERIALS FOR USE IN HMA ASPHALT MIXTURES**

This test method is used to determine the percent of moisture in stockpiles being used in the production of HMA asphalt mixtures. The moisture contents determined are used to correct the weight of material to dry weight. Moisture correction is required for materials being fed into mixing plants that measure the weight prior to drying.

Procedure for recycled materials containing asphalt:

Apparatus: Oven capable of maintaining a temperature of $275 \pm 5^{\circ}\text{F}$.
Balance capable of weighing a minimum of 1000 g and accurate to 0.1 g.
Sample pans
Spatula or spoon for stirring sample

Obtain a representative sample of the recycled material as per Materials I.M. 301. Immediately reduce the sample to the test sample size, minimum of 500 g, by splitting or quartering as per Materials I.M. 336. Record the empty mass of the sample pan and the spatula or spoon. Tare the sample pan on the scale. Place the test sample in the pan and record the original mass of the sample to the nearest 0.1 g. Place the sample in the oven maintained at $275 \pm 5^{\circ}\text{F}$. Stir the sample occasionally. Dry the sample to a constant mass defined as no change in mass exceeding 0.1% of the sample mass in 15 minutes of oven heating. Weigh the sample, pan and spatula or spoon together to avoid any loss of material.

Note: Samples must be split and weighed as quickly as possible to avoid loss of moisture. If the splitting and test sample mass determination cannot be accomplished quickly, the sample should be sealed in a plastic bag until the test sample preparation can be done.

Once the sample has achieved a constant mass, cool the sample to room temperature. Weigh the sample, pan and spatula or spoon together to the nearest 0.1 g. Subtract the mass of the pan and the spatula or spoon from the total mass to obtain the final dry mass of the sample. Calculate the percent moisture by determining the difference between the original mass of the test sample and the final dry mass of the sample and dividing the result by the final dry mass. Multiply the result by 100 to convert to a percentage. Report the moisture content to the nearest 0.1%.

Procedure for aggregates:

Apparatus: Hot Plate (Optional)

Obtain a representative sample of the aggregate as per Materials I.M. 301. Immediately reduce the sample to the test sample size, minimum of 500 g, by splitting or quartering as per Materials I.M. 336. Record the empty mass of the sample pan. Tare the sample pan on the scale. Place the test sample in the pan and record the original mass of the sample to the nearest 0.1 g. Place the sample in the oven maintained at $275 \pm 5^{\circ}\text{F}$ or on a hot plate. Stir the sample occasionally. Dry the sample to a constant mass defined as no change in mass exceeding 0.1% of the sample mass in 15 minutes of heating.

Note: Samples must be split and weighed as quickly as possible to avoid loss of moisture. If the splitting and test sample mass determination cannot be accomplished quickly, the sample should be sealed in a plastic bag until the test sample preparation can be done.

Once the sample has achieved a constant mass, cool the sample to room temperature. Weigh the sample to the nearest 0.1 g. Calculate the percent moisture by determining the difference between the original mass of the test sample and the final dry mass of the sample and dividing the result by the final dry mass. Multiply the result by 100 to convert to a percentage. Report the moisture content to the nearest 0.1%.

Percent Moisture = _____

Appendix I- CERTIFICATION LETTER FOR ASBESTOS CONTAINING MATERIALS

General

Prior to sampling by the Department, submit a letter of certification for ACM to the DME. The letter shall be signed by an authorized representative from the RAS supplier.

(SAMPLE ACM CERTIFICATION LETTER)

DATE: _____

TO: _____ (District Materials Engineer)

FROM: _____ (Supplier's authorized representative)

SUBJECT: Certification of ACM

The recycled asphalt shingles in pile number _____ located at _____

(source) have been certified asbestos free. The ACM testing protocol outlined in the _____

(Supplier name) quality control plan was followed and records are available upon request.

Signed,

(Authorized Representative's Name)

(Authorized Representative's Signature)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger		Office: Materials	Item 13						
Submittal Date: October 20, 2010		Proposed Effective Date: February 15, 2011							
Article No.: Title:		Other: SS-09XXX, Asphalt Emulsions Containing Gilsonite							
Specification Committee Action: Approved with changes.									
Deferred:	Not Approved:	Approved Date: 11/2/2010	Effective Date: 2/15/2011						
Specification Committee Approved Text: See attached Draft SS for Asphalt Emulsions Containing Gilsonite.									
<p>Comments: The Specifications Section asked if this SS will be used every time we are fog sealing shoulders. At this time, it will only be applied when desired, because Asphalt Emulsion Containing Gilsonite is not competitive with a standard asphalt emulsion. The designer will have to apply the SS when desired.</p> <p>The Specifications Section asked if it is intended to include this specification into the April 2011 GS. Until asphalt emulsion containing Gilsonite is used more extensively, this specification will not be added to the Standard Specifications.</p> <p>Method of Measurement and Basis of Payment were added for Asphalt Emulsion Containing Gilsonite since there will be a significant cost difference and the application rate is different.</p> <p>Since the friction results for the asphalt emulsion containing Gilsonite are low, asphalt emulsion containing Gilsonite should not be used on mainline. Center line rumble strips are not sealed, so this does not present an issue at this time.</p>									
Specification Section Recommended Text: See attached Draft SS for Asphalt Emulsions Containing Gilsonite.									
Comments:									
<p>Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)</p> <p style="text-align: center;">SUPPLEMENTAL SPECIFICATIONS FOR ASPHALT EMULSIONS CONTAINING GILSONITE</p> <p style="text-align: center;">Effective Date XX/XX/2010</p> <p>THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SUPPLEMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.</p> <p>Add the following to Article 2308.02 The emulsion may contain Gilsonite Ore with the following modifications to Section 4140:</p> <table style="margin-left: 40px;"> <tr> <td colspan="2">Tests on Residue from Distillation, or Evaporation</td> </tr> <tr> <td style="padding-left: 20px;">i. Viscosity at 275°F (135°C) ASTM D 4402</td> <td style="text-align: right;">= 1.750 Pa(s) max.</td> </tr> <tr> <td style="padding-left: 20px;">ii. Penetration AASHTO T 49</td> <td style="text-align: right;">= 50 dmm max.</td> </tr> </table> <p>Add the following to Article 2308.03, C For emulsions containing Gilsonite use a dilution rate of one part of asphalt residue to one part of water.</p> <p>Add the following to Article 2308.03, D, 1 Uniformly apply the diluted asphalt emulsion at the rate of 0.20 gallon per square yard (0.9 L/m²) of shoulder surface. For emulsions containing Gilsonite use a rate of 0.12 gallons per square yard (0.45</p>				Tests on Residue from Distillation, or Evaporation		i. Viscosity at 275°F (135°C) ASTM D 4402	= 1.750 Pa(s) max.	ii. Penetration AASHTO T 49	= 50 dmm max.
Tests on Residue from Distillation, or Evaporation									
i. Viscosity at 275°F (135°C) ASTM D 4402	= 1.750 Pa(s) max.								
ii. Penetration AASHTO T 49	= 50 dmm max.								

<p>L/m²) of shoulder surface. The application rate may be modified reduced as directed by the Engineer.</p> <p>Add the following to Article 2548.02, B, 1 The emulsion may contain Gilsonite Ore with the following modifications to Section 4140: Tests on Residue from Distillation, or Evaporation i. Viscosity at 275°F (135°C) ASTM D 4402 = 1.750 Pa(s) max. ii. Penetration AASHTO T 49 = 50 dmm max.</p> <p>Add the following to Article 2548.03, C, 3 For emulsions containing Gilsonite, apply at a rate of 0.12 gallons per square yard (0.45 L/m²) of rumble strip surface. The application rate may be modified as directed by the Engineer.</p>					
<p>Reason for Revisions: The SS will allow gilsonite as an option on shoulder fog sealing and should rumble strip sealing applications.</p>					
<p>County or City Input Needed (X one)</p>			<p>Yes</p>		<p>No X</p>
<p>Comments:</p>					
<p>Industry Input Needed (X one)</p>			<p>Yes X</p>		<p>No</p>
<p>Industry Notified:</p>	<p>Yes X</p>	<p>No</p>	<p>Industry Concurrence:</p>	<p>Yes X</p>	<p>No</p>
<p>Comments:</p>					



Iowa Department of Transportation

SUPPLEMENTAL SPECIFICATIONS FOR ASPHALT EMULSIONS CONTAINING GILSONITE

Effective Date
February 15, 2011

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SUPPLEMENTAL SPECIFICATIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

2308.02, Materials.

Add the following to the Article:

When specified, the emulsion shall contain Gilsonite Ore with the following modifications to Section 4140:

Tests on Residue from Distillation, or Evaporation

- Viscosity at 275°F (135°C) ASTM D 4402 = 1.750 Pa-s maximum
- Penetration AASHTO T 49 = 50 dmm maximum

2308.03, C, Dilution.

Add the following to the Article:

For emulsions containing Gilsonite use a dilution rate of one part asphalt emulsion to one part water.

2308.03, D, 1.

Replace the Article:

Uniformly apply the diluted asphalt emulsion at the rate of 0.20 gallon per square yard (0.9 L/m²) of shoulder surface. For emulsions containing Gilsonite use a rate of 0.12 gallons per square yard (0.54 L/m²) of shoulder surface. The application rate may be ~~reduced~~ modified as directed by the Engineer.

2308.04, Method of Measurement.

Renumber Articles B and C and **Add** new Article:

B. Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulders).

As provided in Article 2307.04, B, for undiluted Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulders).

BC. Sand.

Not be measured for payment.

CD. Traffic Control.

Lump sum for the contract.

2308.05, Basis of Payment.

Renumber Article B and Add new Article:

B. Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulders).

1. Per gallon (liter) for undiluted Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulders) that is mixed and used on the project. Diluted asphalt emulsion that is delivered to the job site, but not applied to the roadway surface will not be considered for payment.
2. Payment is full compensation for:
 - a. Cleaning the shoulder surface.
 - b. Furnishing and applying the diluted asphalt emulsion.
 - c. Mixing water.
 - d. Furnishing and applying sand cover.
 - e. Protecting the adjacent pavement and edge lines, including special protection and dams in areas of superelevated curves.

BC. Traffic Control.

The following changes shall apply to the Developmental Specifications for Milled Rumble Strips – HMA or PCC Surface:

2548.02, B, 1.

Add the following to the Article:

The emulsion may contain Gilsonite Ore with the following modifications to Section 4140:

Tests on Residue from Distillation, or Evaporation

- Viscosity at 275°F (135°C) ASTM D 4402 = 1.750 Pa·s maximum
- Penetration AASHTO T 49 = 50 dmm maximum

2548.03, C, 3.

Add the following to the Article:

For emulsions containing Gilsonite, apply at a rate of 0.12 gallons per square yard (0.54 L/m²) of rumble strip surface. The application rate may be modified as directed by the Engineer.

2548.04, Method of Measurement.

Add new Article:

D. Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulder Rumble Strips).

Gallons (liters) as provided in Article 2307.04, B computed from field measurements of distributors or from tank cars or transport trucks as provided in Article 4100.03. When quantities computed from field measurements check within 1.0% of the billed gallons (liters), payment will be based on billed gallons (liters). When quantities computed from field measurements differ from billed gallons (liters) by more than 1.0%, payment will be based on the quantity from field measurements. From these quantities, any amount used by the Contractor as fuel, left in cars, or otherwise not delivered to the road surface will be deducted. The Engineer will advise the Contractor promptly, in writing, of quantities deducted.

2548.05, Basis of Payment.

Add new Article:

D. Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulder Rumble Strips).

1. Per gallon (liter) for undiluted Asphalt Emulsion Containing Gilsonite for Fog Seal (Shoulder Rumble Strips) that is mixed and used on the project. Diluted asphalt emulsion that is delivered to the project site, but not applied to the roadway surface will not be considered for payment.
2. Payment is full compensation for cleaning the shoulder surface, furnishing and applying diluted asphalt emulsion, mixing water, and protecting the adjacent pavement and edge lines.