

1 **Section 5-04, Hot Mix Asphalt**  
2 **January 3, 2017**

3 This section (and all subsections) is revised to read:  
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5 This Section 5-04 is written in a style which, unless otherwise indicated, shall be  
6 interpreted as direction to the Contractor.  
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8 **5-04.1 Description**

9 This Work consists of providing and placing one or more layers of plant-mixed hot mix  
10 asphalt (HMA) on a prepared foundation or base, in accordance with these  
11 Specifications and the lines, grades, thicknesses, and typical cross-sections shown  
12 in the Plans. The manufacture of HMA may include warm mix asphalt (WMA) processes  
13 in accordance with these Specifications.  
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15 HMA shall be composed of asphalt binder and mineral materials as required, and may  
16 include reclaimed asphalt pavement (RAP) or reclaimed asphalt shingles (RAS), mixed  
17 in the proportions specified to provide a homogeneous, stable, and workable mix.  
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19 **5-04.2 Materials**

20 Provide materials as specified in these sections:  
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22	Asphalt Binder	9-02.1(4)
23	Cationic Emulsified Asphalt	9-02.1(6)
24	Anti-Stripping Additive	9-02.4
25	Warm Mix Asphalt Additive	9-02.5
26	Aggregates	9-03.8
27	Reclaimed Asphalt Pavement (RAP)	9-03.8(3)B
28	Reclaimed Asphalt Shingles (RAS)	9-03.8(3)B
29	Mineral Filler	9-03.8(5)
30	Recycled Material	9-03.21
31	Joint Sealants	9-04.2
32	Closed Cell Foam Backer Rod	9-04.2(3)A

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34 **5-04.2(1) How to Get an HMA Mix Design on the QPL**

35 Comply with each of the following:  
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- 37 • Develop the mix design in accordance with WSDOT SOP 732.
- 38 • Develop a mix design that complies with Sections 9-03.8(2) and 9-03.8(6).
- 39 • Develop a mix design no more than 6 months prior to submitting it for QPL  
40 evaluation.
- 41 • Submit mix designs to the WSDOT State Materials Laboratory in  
42 Tumwater, including WSDOT Form 350-042.
- 43 • Include representative samples of the materials that are to be used in the  
44 HMA production as part of the mix design submittal.
- 45 • Identify the brand, type, and percentage of anti-stripping additive in the  
46 mix design submittal.
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- Include with the mix design submittal a certification from the asphalt binder supplier that the anti-stripping additive is compatible with the crude source and the formulation of asphalt binder proposed for use in the mix design.
- Do not include warm mix asphalt (WMA) additives when developing a mix design or submitting a mix design for QPL evaluation. The use of warm mix asphalt (WMA) additives is not part of the process for obtaining approval for listing a mix design on the QPL. Refer to Section 5-04.2(2)B.

The Contracting Agency’s basis for approving, testing, and evaluating HMA mix designs for approval on the QPL is dependent on the contractual basis for acceptance of the HMA mixture, as shown in Table 1.

Table 1

<b>Basis for Contracting Agency Evaluation of HMA Mix Designs for Approval on the QPL</b>		
<b>Contractual Basis for Acceptance of HMA Mixture (see Section 5-04.3(9))</b>	<b>Basis for Contracting Agency Approval of Mix Design for Placement on QPL</b>	<b>Contracting Agency Materials Testing for Evaluation of the Mix Design</b>
Statistical Evaluation	WSDOT Standard Practice QC-8	The Contracting Agency will test the mix design materials for compliance with Sections 9-03.8(2) and 9-03.8(6).
Visual Evaluation	Review of Form 350-042 for compliance with Sections 9-03.8(2) and 9-03.8(6)	The Contracting Agency may elect to test the mix design materials, or evaluate in accordance with WSDOT Standard Practice QC-8, at its sole discretion.

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If the Contracting Agency approves the mix design, it will be listed on the QPL for 12 consecutive months. The Contracting Agency may extend the 12 month listing provided the Contractor submits a certification letter to the Qualified Products Engineer verifying that the aggregate source and job mix formula (JMF) gradation, and asphalt binder crude source and formulation have not changed. The Contractor may submit the certification no sooner than three months prior to expiration of the initial 12 month mix design approval. Within 7 calendar days of receipt of the Contractor’s certification, the Contracting Agency will update the QPL. The maximum duration for approval of a mix design and listing on the QPL will be 24 months from the date of initial approval or as approved by the Engineer.

**5-04.2(1)A Mix Designs Containing RAP and/or RAS**

Mix designs are classified by the RAP and/or RAS content as shown in Table 2.

Table 2

<b>Mix Design Classification Based on RAP/RAS Content</b>	
<b>RAP/RAS Classification</b>	<b>RAP/RAS Content<sup>1</sup></b>
Low RAP/No RAS	$0\% \leq \text{RAP}\% \leq 20\%$ and $\text{RAS}\% = 0\%$
High RAP/Any RAS	$20\% < \text{RAP}\% \leq \text{Maximum Allowable RAP}^2$ and/or $0\% < \text{RAS}\% \leq \text{Maximum Allowable RAS}^2$

<sup>1</sup>Percentages in this table are by total weight of HMA

<sup>2</sup>See Table 4 to determine the limits on the maximum amount RAP and/or RAS.

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**5-04.2(1)A1 Low RAP/No RAS – Mix Design Submittals for Placement on QPL**

For Low RAP/No RAS mix designs, comply with the following additional requirements:

1. Develop the mix design with or without the inclusion of RAP.
2. The asphalt binder grade shall be the grade indicated in the Bid item name or as otherwise required by the Contract.
3. Submit samples of RAP if used in development of the mix design.
4. Testing RAP or RAS stockpiles is not required for obtaining approval for placing these mix designs on the QPL.

**5-04.2(1)A2 High RAP/Any RAS - Mix Design Submittals for Placement on QPL**

For High RAP/Any RAS mix designs, comply with the following additional requirements:

1. For mix designs with any RAS, test the RAS stockpile (and RAP stockpile if any RAP is in the mix design) in accordance with Table 3.
2. For High RAP mix designs with no RAS, test the RAP stockpile in accordance with Table 3.
3. For mix designs with High RAP/Any RAS, construct a single stockpile for RAP and a single stockpile for RAS and isolate (sequester) these stockpiles from further stockpiling before beginning development of the mix design. Test the RAP and RAS during stockpile construction as required by item 1 and 2 above. Use the test data in developing the mix design, and report the test data to the Contracting Agency on WSDOT Form 350-042 as part of the mix design submittal for approval on the QPL. Account for the reduction in asphalt binder contributed from RAS in accordance with AASHTO PP 78. Do not add to these stockpiles after starting the mix design process.

Table 3

Test Frequency of RAP/RAS During RAP/RAS Stockpile Construction For Approving a High RAP/Any RAS Mix Design for Placement on the QPL		
Test Frequency <sup>1</sup>	Test for	Test Method
<ul style="list-style-type: none"> <li>• 1/1000 tons of RAP (minimum of 10 per mix design) and</li> <li>• 1/100 tons of RAS (minimum of 10 per mix design)</li> </ul>	Asphalt Binder Content and Sieve Analysis of Fine and Coarse Aggregate	FOP for AASHTO T 308 and FOP for WAQTC T 27/T 11

<sup>1</sup>“tons”, in this table, refers to tons of the reclaimed material before being incorporated into HMA.

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4. Limit the amount of RAP and/or RAS used in a High RAP/Any RAS mix design by the amount of binder contributed by the RAP and/or RAS, in accordance with Table 4.

Table 4

Maximum Amount of RAP and/or RAS in HMA Mixture	
Maximum Amount of Binder Contributed from:	
RAP	RAS
40% <sup>1</sup> minus contribution of binder from RAS	20% <sup>2</sup>

<sup>1</sup> Calculated as the weight of asphalt binder contributed from the RAP as a percentage of the total weight of asphalt binder in the mixture.

<sup>2</sup> Calculated as the weight of asphalt binder contributed from the RAS as a percentage of the total weight of asphalt binder in the mixture.

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5. Develop the mix design including RAP, RAS, recycling agent, and new binder.
6. Extract, recover, and test the asphalt residue from the RAP and RAS stockpiles to determine the percent of recycling agent and/or grade of new asphalt binder needed to meet but not exceed the performance grade (PG) of asphalt binder required by the Contract.
  - a. Perform the asphalt extraction in accordance with AASHTO T 164 or ASTM D 2172 using reagent grade solvent.
  - b. Perform the asphalt recovery in accordance with AASHTO R 59 or ASTM D 1856.
  - c. Test the recovered asphalt residue in accordance with AASHTO R 29 to determine the asphalt binder grade in accordance with Section 9-02.1(4).

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- d. After determining the recovered asphalt binder grade, determine the percent of recycling agent and/or grade of new asphalt binder in accordance with ASTM D 4887.
  - e. Test the final blend of recycling agent, binder recovered from the RAP and RAS, and new asphalt binder in accordance with AASHTO R 29. The final blended binder shall meet but not exceed the performance grade of asphalt binder required by the Contract and comply with the requirements of Section 9-02.1(4).
7. Include the following test data with the mix design submittal:
- a. All test data from RAP and RAS stockpile construction.
  - b. All data from testing the recovered and blended asphalt binder.
8. Include representative samples of the following with the mix design submittal:
- a. RAP and RAS.
  - b. 150 grams of recovered asphalt residue from the RAP and RAS that are to be used in the HMA production.

**5-04.2(1)B Commercial HMA - Mix Design Submittal for Placement on QPL**

For HMA used in the Bid item Commercial HMA, in addition to the requirements of 5-04.2(1) identify the following in the submittal:

- 1. Commercial HMA
- 2. Class of HMA
- 3. Performance grade of binder
- 4. Equivalent Single Axle Load (ESAL)

The Contracting Agency may elect to approve Commercial HMA mix designs without evaluation.

**5-04.2(1)C Mix Design Resubmittal for QPL Approval**

Develop a new mix design and resubmit for approval on the QPL when any of the following changes occur. When these occur, discontinue using the mix design until after it is reapproved on the QPL.

- 1. Change in the source of crude petroleum used in the asphalt binder.
- 2. Changes in the asphalt binder refining process.

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3. Changes in additives or modifiers in the asphalt binder.
4. Changes in the anti-strip additive, brand, type or quantity.
5. Changes to the source of material for aggregate.
6. Changes to the job mix formula that exceed the amounts as described in item 2 of Section 9-03.8(7), unless otherwise approved by the Engineer.
7. Changes in the percentage of material from a stockpile, when such changes exceed 5% of the total aggregate weight.
  - a. For Low RAP/No RAS mix designs developed without RAP, changes to the percentage of material from a stockpile will be calculated based on the total aggregate weight not including the weight of RAP.
  - b. For Low RAP/No RAS mix designs developed with RAP, changes to the percentage of material from a stockpile will be calculated based on the total aggregate weight including the weight of RAP.
  - c. For High RAP/Any RAS mix designs, changes in the percentage of material from a stockpile will be based on total aggregate weight including the weight of RAP (and/or RAS when included in the mixture).

Prior to making any change in the amount of RAS in an approved mix design, notify the Engineer for determination of whether a new mix design is required, and obtain the Engineer's approval prior to implementing such changes.

#### **5-04.2(2) Mix Design – Obtaining Project Approval**

Use only mix designs listed on the Qualified Products List (QPL). Submit WSDOT Form 350-041 to the Engineer to request approval to use a mix design from the QPL. Changes to the job mix formula (JMF) that have been approved on other contracts may be included. The Engineer may reject a request to use a mix design if production of HMA using that mix design on any contract is not in compliance with Section 5-04.3(11)D, E, F, and G for mixture or compaction.

#### **5-04.2(2)A Changes to the Job Mix Formula**

The approved mix design obtained from the QPL will be considered the starting job mix formula (JMF) and shall be used as the initial basis for acceptance of HMA mixture, as detailed in Section 5-04.3(9).

During production the Contractor may request to adjust the JMF. Any adjustments to the JMF will require approval of the Engineer and shall be made in accordance with item 2 of Section 9-03.8(7). After approval by the Engineer, such adjusted JMF's shall constitute the basis for acceptance of the HMA mixture.

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**5-04.2(2)B Using Warm Mix Asphalt Processes**

The Contractor may, at the Contractor’s discretion, elect to use warm mix asphalt (WMA) processes for producing HMA. WMA processes include organic additives, chemical additives, and foaming. The use of WMA is subject to the following:

- Do not use WMA processes in the production of High RAP/Any RAS mixtures.
- Before using WMA processes, obtain the Engineer’s approval using WSDOT Form 350-076 to describe the proposed WMA process.

**5-04.3 Construction Requirements**

**5-04.3(1) Weather Limitations**

Do not place HMA for wearing course on any Traveled Way beginning October 1<sup>st</sup> through March 31<sup>st</sup> of the following year, without written concurrence from the Engineer.

Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified in Table 5, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Table 5

Minimum Surface Temperature for Paving		
Compacted Thickness (Feet)	Wearing Course	Other Courses
Less than 0.10	55°F	45°F
0.10 to 0.20	45°F	35°F
More than 0.20	35°F	35°F

**5-04.3(2) Paving Under Traffic**

These requirements apply when the Roadway being paved is open to traffic.

In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

During paving operations, maintain temporary pavement markings throughout the project. Install temporary pavement markings on the Roadway prior to opening to traffic. Temporary pavement markings shall comply with Section 8-23.

**5-04.3(3) Equipment**

**5-04.3(3)A Mixing Plant**

Equip mixing plants as follows.

1. **Use tanks for storage and preparation of asphalt binder which:**
  - Heat the contents by means that do not allow flame to contact the contents or the tank, such as by steam or electricity.
  - Heat and hold contents at the required temperatures.

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- Continuously circulate contents to provide uniform temperature and consistency during the operating period.
  - Provide an asphalt binder sampling valve, in either the storage tank or the supply line to the mixer.
2. **Provide thermometric equipment:**
- In the asphalt binder feed line near the charging valve at the mixer unit, capable of detecting temperature ranges expected in the HMA and in a location convenient and safe for access by Inspectors.
  - At the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates, and situated in full view of the plant operator.
3. **When heating asphalt binder:**
- Do not exceed the maximum temperature of the asphalt binder recommended by the asphalt binder supplier.
  - Avoid local variations in heating.
  - Provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F.
4. **Provide a mechanical sampler for sampling mineral materials that:**
- Meets the crushing or screening requirements of Section 1-05.6.
5. **Provide HMA sampling equipment that complies with WSDOT SOP T-168.**
- Use a mechanical sampling device installed between the discharge of the silo and the truck transport, approved by the Engineer, or
  - Platforms or devices to enable sampling from the truck transport without entering the truck transport for sampling HMA.
6. **Provide for setup and operation of the Contracting Agency's field testing:**
- As required in Section 3-01.2(2).
7. **Provide screens or a lump breaker:**
- When using any RAP or any RAS, to eliminate oversize RAP or RAS particles from entering the pug mill or drum mixer.

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**5-04.3(3)B Hauling Equipment**

Provide HMA hauling equipment with tight, clean, smooth metal beds and a cover of canvas or other suitable material of sufficient size to protect the HMA from adverse weather. Securely attach the cover to protect the HMA whenever the weather conditions during the work shift include, or are forecast to include, precipitation or an air temperature less than 45°F.

Prevent HMA from adhering to the hauling equipment. Spray metal beds with an environmentally benign release agent. Drain excess release agent prior to filling hauling equipment with HMA. Do not use petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA. For hopper trucks, operate the conveyer during the process of applying the release agent.

**5-04.3(3)C Pavers**

Use self-contained, power-propelled pavers provided with an internally heated vibratory screed that is capable of spreading and finishing courses of HMA in lane widths required by the paving section shown in the Plans.

When requested by the Engineer, provide written certification that the paver is equipped with the most current equipment available from the manufacturer for the prevention of segregation of the coarse aggregate particles. The certification shall list the make, model, and year of the paver and any equipment that has been retrofitted to the paver.

Operate the screed in accordance with the manufacturer's recommendations and in a manner to produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. Provide a copy of the manufacturer's recommendations upon request by the Contracting Agency. Extensions to the screed will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the primary screed. In the Travelled Way do not use extensions without both augers and an internally heated vibratory screed.

Equip the paver with automatic screed controls and sensors for either or both sides of the paver. The controls shall be capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing automatic signals that operate the screed to maintain the desired grade and transverse slope. Construct the sensor so it will operate from a reference line or a mat referencing device. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent.

Equip the paver with automatic feeder controls, properly adjusted to maintain a uniform depth of material ahead of the screed.

Manual operation of the screed is permitted in the construction of irregularly shaped and minor areas. These areas include, but are not limited to, gore areas, road approaches, tapers and left-turn channelizations.

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When specified in the Contract, provide reference lines for vertical control. Place reference lines on both outer edges of the Traveled Way of each Roadway. Horizontal control utilizing the reference line is permitted. Automatically control the grade and slope of intermediate lanes by means of reference lines or a mat referencing device and a slope control device. When the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. A joint matcher may be used subject to the approval of the Engineer. The reference line may be removed after completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

Furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Engineer may suspend Work as allowed by Section 1-08.6.

**5-04.3(3)D Material Transfer Device or Material Transfer Vehicle**

Use a material transfer device (MTD) or material transfer vehicle (MTV) to deliver the HMA from the hauling equipment to the paving machine for any lift in (or partially in) the top 0.30 feet of the pavement section used in traffic lanes. However, an MTD/V is not required for HMA placed in irregularly shaped and minor areas such as tapers and turn lanes, or for HMA mixture that is accepted by Visual Evaluation. At the Contractor's request the Engineer may approve paving without an MTD/V; the Engineer will determine if an equitable adjustment in cost or time is due. If a windrow elevator is used, the Engineer may limit the length of the windrow in urban areas or through intersections.

To be approved for use, an MTV:

1. Shall be a self-propelled vehicle, separate from the hauling vehicle or paver.
2. Shall not connected to the hauling vehicle or paver.
3. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
4. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
5. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

To be approved for use, an MTD:

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1. Shall be positively connected to the paver.
2. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
3. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
4. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

**5-04.3(3)E Rollers**

Operate rollers in accordance with the manufacturer's recommendations. When requested by the Engineer, provide a Type 1 Working Drawing of the manufacturer's recommendation for the use of any roller planned for use on the project. Do not use rollers that crush aggregate, produce pickup or washboard, unevenly compact the surface, displace the mix, or produce other undesirable results.

**5-04.3(4) Preparation of Existing Paved Surfaces**

Before constructing HMA on an existing paved surface, the entire surface of the pavement shall be clean. Entirely remove all fatty asphalt patches, grease drippings, and other deleterious substances from the existing pavement to the satisfaction of the Engineer. Thoroughly clean all pavements or bituminous surfaces of dust, soil, pavement grindings, and other foreign matter. Thoroughly remove any cleaning or solvent type liquids used to clean equipment spilled on the pavement before paving proceeds. Fill all holes and small depressions with an appropriate class of HMA. Level and thoroughly compact the surface of the patched area.

Apply a uniform coat of asphalt (tack coat) to all paved surfaces on which any course of HMA is to be placed or abutted. Apply tack coat to cover the cleaned existing pavement with a thin film of residual asphalt free of streaks and bare spots. Apply a heavy application of tack coat to all joints. For Roadways open to traffic, limit the application of tack coat to surfaces that will be paved during the same working shift. Equip the spreading equipment with a thermometer to indicate the temperature of the tack coat material.

Do not operate equipment on tacked surfaces until the tack has broken and cured. Repair tack coat damaged by the Contractor's operation, prior to placement of the HMA.

Unless otherwise approved by the Engineer, use cationic emulsified asphalt CSS-1, CSS-1h, STE-1, or Performance Graded (PG) asphalt for tack coat. The CSS-1 and CSS-1h may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. Do not allow the tack coat material to exceed the maximum temperature recommended by the asphalt supplier.

When shown in the Plans, prelevel uneven or broken surfaces over which HMA is to be placed by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

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**5-04.3(4)A Crack Sealing**

**5-04.3(4)A1 General**

When the Proposal includes a pay item for crack sealing, seal all cracks ¼ inch in width and greater.

**Cleaning:** Ensure that cracks are thoroughly clean, dry and free of all loose and foreign material when filling with crack sealant material. Use a hot compressed air lance to dry and warm the pavement surfaces within the crack immediately prior to filling a crack with the sealant material. Do not overheat pavement. Do not use direct flame dryers. Routing cracks is not required.

**Sand Slurry:** For cracks that are to be filled with sand slurry, thoroughly mix the components and pour the mixture into the cracks until full. Add additional CSS-1 cationic emulsified asphalt to the sand slurry as needed for workability to ensure the mixture will completely fill the crack. Strike off the sand slurry flush with the existing pavement surface and allow the mixture to cure. Top off cracks that were not completely filled with additional sand slurry. Do not place the HMA overlay until the slurry has fully cured.

**Hot Poured Sealant:** For cracks that are to be filled with hot poured sealant, apply the material in accordance with these requirements and the manufacturer's recommendations. Furnish a Type 1 Working Drawing of the manufacturer's product information and recommendations to the Engineer prior to the start of work, including the manufacturer's recommended heating time and temperatures, allowable storage time and temperatures after initial heating, allowable reheating criteria, and application temperature range. Confine hot poured sealant material within the crack. Clean any overflow of sealant from the pavement surface. If, in the opinion of the Engineer, the Contractor's method of sealing the cracks with hot poured sealant results in an excessive amount of material on the pavement surface, stop and correct the operation to eliminate the excess material.

**5-04.3(4)A2 Crack Sealing Areas Prior to Paving**

In areas where HMA will be placed, use sand slurry to fill the cracks.

**5-04.3(4)A3 Crack Sealing Areas Not to be Paved**

In areas where HMA will not be placed, fill the cracks as follows:

1. Cracks ¼ inch to 1 inch in width - fill with hot poured sealant.
2. Cracks greater than 1 inch in width – fill with sand slurry.

**5-04.3(4)B Soil Residual Herbicide**

Where shown in the Plans, apply one application of an approved soil residual herbicide. Comply with Section 8-02.3(3)B. Complete paving within 48 hours of applying the herbicide.

Use herbicide registered with the Washington State Department of Agriculture for use under pavement. Before use, obtain the Engineer's approval of the

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herbicide and the proposed rate of application. Include the following information in the request for approval of the material:

1. Brand Name of the Material,
2. Manufacturer,
3. Environmental Protection Agency (EPA) Registration Number,
4. Material Safety Data Sheet, and
5. Proposed Rate of Application.

**5-04.3(4)C Pavement Repair**

Excavate pavement repair areas and backfill these with HMA in accordance with the details shown in the Plans and as staked. Conduct the excavation operations in a manner that will protect the pavement that is to remain. Repair pavement not designated to be removed that is damaged as a result of the Contractor's operations to the satisfaction of the Engineer at no cost to the Contracting Agency. Excavate only within one lane at a time unless approved otherwise by the Engineer. Do not excavate more area than can be completely backfilled and compacted during the same shift.

Unless otherwise shown in the Plans or determined by the Engineer, excavate to a depth of 1.0 feet. The Engineer will make the final determination of the excavation depth required.

The minimum width of any pavement repair area shall be 40 inches unless shown otherwise in the Plans. Before any excavation, sawcut the perimeter of the pavement area to be removed unless the pavement in the pavement repair area is to be removed by a pavement grinder.

Excavated materials shall be the property of the Contractor and shall be disposed of in a Contractor-provided site off the Right of Way or used in accordance with Sections 2-02.3(3) or 9-03.21.

Apply a heavy application of tack coat to all surfaces of existing pavement in the pavement repair area, in accordance with Section 5-04.3(4).

Place the HMA backfill in lifts not to exceed 0.35-foot compacted depth. Thoroughly compact each lift by a mechanical tamper or a roller.

**5-04.3(5) Producing/Stockpiling Aggregates, RAP, & RAS**

Produce aggregate in compliance with Section 3-01. Comply with Section 3-02 for preparing stockpile sites, stockpiling, and removing from stockpile each of the following: aggregates, RAP, and RAS. Provide sufficient storage space for each size of aggregate, RAP and RAS. Fine aggregate or RAP may be uniformly blended with the RAS as a method of preventing the agglomeration of RAS particles. Remove the aggregates, RAP and RAS from stockpile(s) in a manner that ensures minimal segregation when being moved to the HMA plant for processing into the final mixture. Keep different aggregate sizes separated until they have been delivered to the HMA plant.

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**5-04.3(5)A Stockpiling RAP or RAS for High RAP/Any RAS Mixes**

Do not place any RAP or RAS into a stockpile which has been sequestered for a High RAP/Any RAS mix design. Do not incorporate any RAP or RAS into a High RAP/Any RAS mixture from any source other than the stockpile which was sequestered for approval of that particular High RAP/Any RAS mix design.

RAP that is used in a Low RAP/No RAS mix is not required to come from a sequestered stockpile.

**5-04.3(6) Mixing**

The asphalt supplier shall introduce anti-stripping additive, in the amount designated on the QPL for the mix design, into the asphalt binder prior to shipment to the asphalt mixing plant.

Anti-strip is not required for temporary work that will be removed prior to Physical Completion.

Use asphalt binder of the grade, and from the supplier, in the approved mix design.

Prior to introducing reclaimed materials into the asphalt plant, remove wire, nails, and other foreign material. Discontinue use of the reclaimed material if the Engineer, in their sole discretion, determines the wire, nails, or other foreign material to be excessive.

Size RAP and RAS prior to entering the mixer to provide uniform and thoroughly mixed HMA. If there is evidence of the RAP or RAS not breaking down during the heating and mixing of the HMA, immediately suspend the use of the RAP or RAS until changes have been approved by the Engineer.

After the required amount of mineral materials, RAP, RAS, new asphalt binder and recycling agent have been introduced into the mixer, mix the HMA until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials, RAP and RAS is ensured.

Upon discharge from the mixer, ensure that the temperature of the HMA does not exceed the optimum mixing temperature shown on the approved Mix Design Report by more than 25°F, or as approved by the Engineer. When a WMA additive is included in the manufacture of HMA, do not heat the WMA additive (at any stage of production including in binder storage tanks) to a temperature higher than the maximum recommended by the manufacturer of the WMA additive.

A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, reduce the moisture content.

During the daily operation, HMA may be temporarily held in approved storage facilities. Do not incorporate HMA into the Work that has been held for more

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than 24 hours after mixing. Provide an easily readable, low bin-level indicator on the storage facility that indicates the amount of material in storage. Waste the HMA in storage when the top level of HMA drops below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift. Dispose of rejected or waste HMA at no expense to the Contracting Agency.

**5-04.3(7) Spreading and Finishing**

Do not exceed the maximum nominal compacted depth of any layer in any course, as shown in Table 6, unless approved by the Engineer:

Table 6

Maximum Nominal Compacted Depth of Any Layer		
HMA Class	Wearing Course	Other than Wearing Course
1 inch	0.35 feet	0.35 feet
¾ and ½ inch	0.30 feet	0.35 feet
⅜ inch	0.15 feet	0.15 feet

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Use HMA pavers complying with Section 5-04.3(3) to distribute the mix. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, place the material produced for each JMF with separate spreading and compacting equipment. Do not intermingle HMA produced from more than one JMF. Each strip of HMA placed during a work shift shall conform to a single JMF established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

**5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA**

Sample aggregate for meeting the requirements of Section 3-04 prior to being incorporated into HMA. (The acceptance data generated for the Section 3-04 acceptance analysis will not be commingled with the acceptance data generated for the Section 5-04.3(9) acceptance analysis.) Aggregate acceptance samples shall be taken as described in Section 3-04. Aggregate acceptance testing will be performed by the Contracting Agency. Aggregate contributed from RAP and/or RAS will not be evaluated under Section 3-04.

For aggregate that will be used in HMA mixture which will be accepted by Statistical Evaluation, the Contracting Agency's acceptance of the aggregate will be based on:

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1. Samples taken prior to mixing with asphalt binder, RAP, or RAS;
2. Testing for the materials properties of fracture, uncompacted void content, and sand equivalent;
3. Evaluation by the Contracting Agency in accordance with Section 3-04, including price adjustments as described therein.

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For aggregate that will be used in HMA which will be accepted by Visual Evaluation, evaluation in accordance with items 1, 2, and 3 above is at the discretion of the Engineer.

**5-04.3(9) HMA Mixture Acceptance**

The Contracting Agency will evaluate HMA mixture for acceptance by one of three methods as determined from the criteria in Table 7.

Table 7

<b>Basis of Acceptance for HMA Mixture</b>			
	<b>Visual Evaluation</b>		<b>Statistical Evaluation</b>
<b>Criteria for Selecting the Evaluation Method</b>	<ul style="list-style-type: none"> <li>• Commercial HMA placed at any location</li> <li>• Any HMA placed in:               <ul style="list-style-type: none"> <li>○ sidewalks</li> <li>○ road approaches</li> <li>○ ditches</li> <li>○ slopes</li> <li>○ paths</li> <li>○ trails</li> <li>○ gores</li> <li>○ prelevel</li> <li>○ temporary pavement<sup>1</sup></li> <li>○ pavement repair</li> </ul> </li> <li>• Other nonstructural applications of HMA as approved by the Engineer</li> </ul>	•	• All HMA mixture other than that accepted by Visual Evaluation

<sup>1</sup> Temporary pavement is HMA that will be removed before Physical Completion of the Contract.

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**5-04.3(9)A Test Sections**

This Section applies to HMA mixture accepted by Statistical Evaluation. A test section is not allowed for HMA accepted by Visual Evaluation.

The purpose of a test section is to determine whether or not the Contractor's mix design and production processes will produce HMA meeting the Contract requirements related to mixture. Construct HMA mixture test sections at the beginning of paving, using at least 600 tons and a maximum of 1,000 tons or as specified by the Engineer. Each test section shall be constructed in one continuous operation.

**5-04.3(9)A1 Test Section – When Required, When to Stop**

Use Tables 8 and 9 to determine when a test section is required, optional, or not allowed, and to determine when performing test sections may end. Each mix design will be evaluated independently for the test section requirements. If more than one test section is required, each test section shall be evaluated separately by the criteria in table 8 and 9.

Table 8

<b>Criteria for Conducting and Evaluating HMA Mixture Test Sections</b> (For HMA Mixture Accepted by Statistical Evaluation)		
	<b>High RAP/Any RAS</b>	<b>Low RAP/No RAS</b>
Is Mixture Test Section Optional or Mandatory?	Mandatory <sup>1</sup>	At Contractor's Option
Waiting period after paving the test section.	4 calendar days <sup>2</sup>	4 calendar days <sup>2</sup>
What Must Happen to Stop Performing Test Sections?	Meet "Results Required to Stop Performing Test Sections" in Table 9 for High RAP/Any RAS.	Provide samples and respond to WSDOT test results required by Table 9 for Low RAP/No RAS.

<sup>1</sup>If a mix design has produced an acceptable test section on a previous contract (paved in the same calendar year, from the same plant, using the same JMF) the test section may be waived if approved by the Engineer.

<sup>2</sup>This is to provide time needed by the Contracting Agency to complete testing and the Contractor to adjust the mixture in response to those test results. Paving may resume when this is done.

Table 9

<b>Results Required to Stop Performing HMA Mixture Test Sections<sup>1</sup></b> (For HMA Mixture Accepted by Statistical Evaluation)		
<b>Test Property</b>	<b>Type of HMA</b>	
	<b>High RAP/Any RAS</b>	<b>Low RAP/No RAS</b>
Gradation	Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>	None <sup>4</sup>
Asphalt Binder	Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>	None <sup>4</sup>
$V_a$	Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>	None <sup>4</sup>
Hamburg Wheel Track Indirect Tensile Strength	Meet requirements of Section 9-03.8(2). <sup>3</sup>	These tests will not be done as part of Test Section.

Aggregates Sand Equivalent Uncompacted Void Content Fracture	Nonstatistical Evaluation in accordance with the requirements of Section 3-04 <sup>3</sup>	None <sup>3</sup>
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<sup>1</sup>In addition to the requirements of this table, acceptance of the HMA mixture used in each test section is subject to the acceptance criteria and price adjustments for Statistical Evaluation (see Table 9a).

<sup>2</sup>Divide the test section lot into three sublots, approximately equal in size. Take one sample from each subplot, and test each sample for the property in the first column.

<sup>3</sup>Take one sample for each test section lot. Test the sample for the properties in the first column.

<sup>4</sup>Divide the test section lot into three sublots, approximately equal in size. Take one sample from each subplot, and test each sample for the property in the first column. There are no criteria for discontinuing test sections for these mixes; however, the contractor must comply with Section 5-04.3(11)F before resuming paving.

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**5-04.3(9)A2 Test Section – Evaluating the HMA Mixture in a Test Section**

The Engineer will evaluate the HMA mixture in each test section for rejection, acceptance, and price adjustments based on the criteria in Table 9a using the data generated from the testing required by Table 9. Each test section shall be considered a separate lot.

Table 9a

<b>Acceptance Criteria for HMA Mixture Placed in a Test Section (For HMA Mixture Accepted by Statistical Evaluation)</b>		
<b>Test Property</b>	<b>Type of HMA</b>	
	<b>High RAP/Any RAS</b>	<b>Low RAP/No RAS</b>
Gradation Asphalt Binder $V_a$	Statistical Evaluation	Statistical Evaluation
Hamburg Wheel Track Indirect Tensile Strength	Pass/Fail for the requirements of Section 9-03.8(2) <sup>1</sup>	N/A
HMA Aggregate Sand Equivalent Uncompacted Void Content	Nonstatistical Evaluation in accordance with the requirements of Section 3-04	Nonstatistical Evaluation in accordance with the requirements of Section 3-04

<sup>1</sup>Failure to meet the specifications for Hamburg and/or IDT will cause the mixture in the test section to be rejected. Refer to Section 5-04.3(11).

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**5-04.3(9)B Mixture Acceptance – Statistical Evaluation**

**5-04.3(9)B1 Mixture Statistical Evaluation – Lots and Sublots**

HMA mixture which is accepted by Statistical Evaluation will be evaluated by the Contracting Agency dividing that HMA tonnage into mixture lots, and each mixture lot will be evaluated using stratified random sampling by the Contracting Agency sub-dividing each mixture lot into mixture sublots. All mixture in a mixture lot shall be of the same mix design. The mixture sublots will be numbered in the order in which the mixture (of a particular mix design) is paved.

Each mixture lot comprises a maximum of 15 mixture sublots, except:

- The final mixture lot of each mix design on the Contract will comprise a maximum of 25 sublots.
- A mixture lot for a test section will consist of three sublots.

Each mixture subplot shall be approximately uniform in size with the maximum mixture subplot size as specified in Table 10. The quantity of material represented by the final mixture subplot of the project, for each mix design on the project, may be increased to a maximum of two times the mixture subplot quantity calculated.

Table 10

<b>Maximum HMA Mixture Sublot Size For HMA Accepted by Statistical Evaluation</b>	
<b>HMA Original Plan Quantity (tons)<sup>1</sup></b>	<b>Maximum Sublot Size (tons)<sup>2</sup></b>
< 20,000	1,000
20,000 to 30,000	1,500
>30,000	2,000

<sup>1</sup> "Plan quantity" means the plan quantity of all HMA of the same class and binder grade which is accepted by Statistical Evaluation.

<sup>2</sup> The maximum subplot size for each combination of HMA class and binder grade shall be calculated separately.

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- For a mixture lot in progress with a mixture CPF less than 0.75, a new mixture lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced. See also Section 5-04.3(11)F.
- If, before completing a mixture lot, the Contractor requests a change to the JMF which is approved by the Engineer, the mixture produced in that lot after the approved change will be evaluated on the basis of the changed JMF, and the mixture produced in that lot before the approved change will be evaluated on the basis of the unchanged JMF; however, the mixture before and after the change will be evaluated in the same lot. Acceptance of subsequent mixture lots will be evaluated on the basis of the changed JMF.

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**5-04.3(9)B2 Mixture Statistical Evaluation – Sampling**

Comply with Section 1-06.2(1).

Samples of HMA mixture which is accepted by Statistical Evaluation will be randomly selected from within each subplot, with one sample per subplot. The Engineer will determine the random sample location using WSDOT Test Method T 716. The Contractor shall obtain the sample when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with FOP for WAQTC T 168.

**5-04.3(9)B3 Mixture Statistical Evaluation – Acceptance Testing**

Comply with Section 1-06.2(1).

The Contracting Agency will test the mixture sample from each subplot (including sublots in a test section) for the properties shown in Table 11.

Table 11

Testing Required for each HMA Mixture Sublot		
Test	Procedure	Performed by
V <sub>a</sub>	WSDOT SOP 731	Engineer
Asphalt Binder Content	FOP for AASHTO T 308	Engineer
Gradation: Percent Passing 1½", 1", ¾", ½", ⅜", No. 4, No. 8, No. 200	FOP for WAQTC T 27/T 11	Engineer

The mixture samples and tests taken for the purpose of determining acceptance of the test section (as described in Section 5-04.3(9)A) shall also be used as the test results for acceptance of the mixture described in 5-04.3(9)B3, 5-04.3(9)B4, 5-04.3(9)B5, and 5-04.3(9)B6.

**5-04.3(9)B4 Mixture Statistical Evaluation – Pay Factors**

Comply with Section 1-06.2(2).

The Contracting Agency will determine a pay factor (PF<sub>i</sub>) for each of the properties in Table 11, for each mixture lot, using the quality level analysis in Section 1-06.2(2)D. For Gradation, a pay factor will be calculated for each of the sieve sizes listed in Table 11 which is equal to or smaller than the maximum allowable aggregate size (100 percent passing sieve) of the HMA mixture. The USL and LSL shall be calculated using the Job Mix Formula Tolerances (for Statistical Evaluation) in Section 9-03.8(7).

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

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**5-04.3(9)B5 Mixture Statistical Evaluation – Composite Pay Factors (CPF)**

Comply with Section 1-06.2(2).

In accordance with Section 1-06.2(2)D4, the Contracting Agency will determine a Composite Pay Factor (CPF) for each mixture lot from the pay factors calculated in Section 5-04.3(9)B4, using the price adjustment factors in Table 12. Unless otherwise specified, the maximum CPF for HMA mixture shall be 1.05.

Table 12

<b>HMA Mixture Price Adjustment Factors</b>	
<b>Constituent</b>	<b>Factor “f”</b>
All aggregate passing: 1½", 1", ¾", ½", ⅜" and No.4 sieves	2
All aggregate passing No. 8 sieve	15
All aggregate passing No. 200 sieve	20
Asphalt binder	40
Air Voids (V <sub>a</sub> )	20

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**5-04.3(9)B6 Mixture Statistical Evaluation – Price Adjustments**

For each HMA mixture lot, a Job Mix Compliance Price Adjustment will be determined and applied, as follows:

$$JMCPA = [0.60 \times (CPF - 1.00)] \times Q \times UP$$

Where

- JMCPA = Job Mix Compliance Price Adjustment for a given lot of mixture (\$)
- CPF = Composite Pay factor for a given lot of mixture (maximum is 1.05)
- Q = Quantity in a given lot of mixture (tons)
- UP = Unit price of the HMA in a given lot of mixture (\$/ton)

**5-04.3(9)B7 Mixture Statistical Evaluation – Retests**

The Contractor may request that a mixture subplot be retested. To request a retest, submit a written request to the Contracting Agency within 7 calendar days after the specific test results have been posted to the website or emailed to the Contractor, whichever occurs first. The Contracting Agency will send a split of the original acceptance sample for testing by the Contracting Agency to either the Region Materials Laboratory or the State Materials Laboratory as determined by the Engineer. The Contracting Agency will not test the split of the sample with the same equipment or by the same tester that ran the original acceptance test. The sample will be tested for a complete gradation analysis, asphalt binder content, and V<sub>a</sub>, and the results of the retest will be used for the acceptance of the HMA mixture in place of the original mixture subplot sample test results. The cost of testing will be deducted from any monies due or that may come due the Contractor under the Contract at the rate of \$250 per sample.

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**5-04.3(9)C Vacant**

**5-04.3(9)D Mixture Acceptance – Visual Evaluation**

Visual Evaluation of HMA mixture will be by visual inspection by the Engineer or, in the sole discretion of the Engineer, the Engineer may sample and test the mixture.

**5-04.3(9)D1 Mixture Visual Evaluation – Lots, Sampling, Testing, Price Adjustments**

HMA mixture accepted by Visual Evaluation will not be broken into lots unless the Engineer determines that testing is required. When that occurs, the Engineer will identify the limits of the questionable HMA mixture, and that questionable HMA mixture shall constitute a lot. Then, the Contractor will take samples from the truck, or the Engineer will take core samples from the roadway at a minimum of three random locations from within the lot, selected in accordance with WSDOT Test Method T 716, taken from the roadway in accordance with WSDOT SOP 734, and tested in accordance with WSDOT SOP 737. The Engineer will test one of the samples for all constituents in Section 5-04.3(9)B3. If all constituents from that test fall within the Job Mix Formula Tolerances (for Visual Evaluation) in Section 9-03.8(7), the lot will be accepted at the unit Contract price with no further evaluation.

When one or more constituents fall outside those tolerance limits, the other samples will be tested for all constituents in Section 5-04.3(9)B3, and a Job Mix Compliance Price Adjustment will be calculated in accordance with Table 13.

Table 13

<b>Visual Evaluation – Out of Tolerance Procedures</b>	
Comply with the Following	
Pay Factors <sup>1</sup>	Section 5-04.3(9)B4
Composite Pay Factors <sup>2</sup>	Section 5-04.3(9)B5
Price Adjustments	Section 5-04.3(9)B6

<sup>1</sup>The Visual Evaluation tolerance limits in Section 9-03.8(7) will be used in the calculation of the PF<sub>i</sub>.

<sup>2</sup>The maximum CPF shall be 1.00.

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**5-04.3(9)E Mixture Acceptance – Notification of Acceptance Test Results**

The results of all mixture acceptance testing and the Composite Pay Factor (CPF) of the lot after three sublots have been tested will be available to the Contractor through The Contracting Agency’s website.

The Contracting Agency will endeavor to provide written notification (via email to the Contractor’s designee) of acceptance test results through its web-based materials testing system Statistical Analysis of Materials (SAM) within 24 hours of the sample being made available to the Contracting Agency. However, the Contractor agrees:

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1. Quality control, defined as the system used by the Contractor to monitor, assess, and adjust its production processes to ensure that the final HMA mixture will meet the specified level of quality, is the sole responsibility of the Contractor.
2. The Contractor has no right to rely on any testing performed by the Contracting Agency, nor does the Contractor have any right to rely on timely notification by the Contracting Agency of the Contracting Agency’s test results (or statistical analysis thereof), for any part of quality control and/or for making changes or correction to any aspect of the HMA mixture.
3. The Contractor shall make no claim for untimely notification by the Contracting Agency of the Contracting Agency’s test results or statistical analysis.

**5-04.3(10) HMA Compaction Acceptance**

For all HMA, the Contractor shall comply with the General Compaction Requirements in Section 5-04.3(10)A. The Contracting Agency will evaluate all HMA for compaction compliance with one of the following - Statistical Evaluation, Visual Evaluation, or Test Point Evaluation - determined by the criteria in Table 14:

Table 14

<b>Criteria for Determining Method of Evaluation for HMA Compaction<sup>1</sup></b>		
<b>Statistical Evaluation of HMA Compaction is Required For:</b>	<b>Visual Evaluation of HMA Compaction is Required For:</b>	<b>Test Point Evaluation of HMA Compaction is Required For:</b>
<ul style="list-style-type: none"> <li>• Any HMA for which the specified course thickness is greater than 0.10 feet, and the HMA is in:               <ul style="list-style-type: none"> <li>○ traffic lanes, including but not limited to:                   <ul style="list-style-type: none"> <li>• ramp lanes</li> <li>• truck climbing lanes</li> <li>• weaving lanes</li> <li>• speed change lanes</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• “HMA for Preleveling...”</li> <li>• “HMA for Pavement Repair...”</li> </ul>	<ul style="list-style-type: none"> <li>• Any HMA not meeting the criteria for Statistical Evaluation or Visual Evaluation</li> </ul>

<sup>1</sup>This table applies to all HMA, and shall be the sole basis for determining the acceptance method for compaction.

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The Contracting Agency may, at its sole discretion, evaluate any HMA for compliance with the Cyclic Density requirements of Section 5-04.3(10)B.

**5-04.3(10)A HMA Compaction – General Compaction Requirements**

Immediately after the HMA has been spread and struck off, and after surface irregularities have been adjusted, thoroughly and uniformly

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compact the mix. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, and irregularities and shall conform to the line, grade, and cross-section shown in the Plans. If necessary, alter the JMF in accordance with Section 9-03.8(7) to achieve desired results.

Compact the mix when it is in the proper condition so that no undue displacement, cracking, or shoving occurs. Compact areas inaccessible to large compaction equipment by mechanical or hand tampers. Remove HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective. Replace the removed material with new HMA, and compact it immediately to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. An exception shall be that pneumatic tired rollers shall be used for compaction of the wearing course beginning October 1<sup>st</sup> of any year through March 31<sup>st</sup> of the following year. Coverage with a steel wheel roller may precede pneumatic tired rolling. Unless otherwise approved by the Engineer, operate rollers in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, do not operate a roller in a mode that results in checking or cracking of the mat.

On bridge decks and on the five feet of roadway approach immediately adjacent to the end of bridge/back of pavement seat, operate rollers in static mode only.

**5-04.3(10)B HMA Compaction – Cyclic Density**

Low cyclic density areas are defined as spots or streaks in the pavement that are less than 90 percent of the theoretical maximum density. At the Engineer's discretion, the Engineer may evaluate the HMA pavement for low cyclic density, and when doing so will follow WSDOT SOP 733. A \$500 Cyclic Density Price Adjustment will be assessed for any 500-foot section with two or more density readings below 90 percent of the theoretical maximum density.

**5-04.3(10)C HMA Compaction Acceptance – Statistical Evaluation**

HMA compaction which is accepted by Statistical Evaluation will be based on acceptance testing performed by the Contracting Agency, and statistical analysis of those acceptance tests results. This will result in a Compaction Price Adjustment.

**5-04.3(10)C1 HMA Compaction Statistical Evaluation – Lots and Sublots**

HMA compaction which is accepted by Statistical Evaluation will be evaluated by the Contracting Agency dividing the project into compaction lots, and each compaction lot will be evaluated using stratified random sampling by the Contracting Agency sub-dividing each compaction lot into compaction sublots. All mixture in any individual compaction lot shall be of the same mix design. The

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compaction sublots will be numbered in the order in which the mixture (of a particular mix design) is paved.

Each compaction lot comprises a maximum of 15 compaction sublots, except for the final compaction lot of each mix design on the Contract, which comprises a maximum of 25 sublots.

Each compaction subplot shall be uniform in size as shown in Table 15, except that the last compaction subplot of each day may be increased to a maximum of two times the compaction subplot quantity calculated. Minor variations in the size of any subplot shall not be cause to invalidate the associated test result.

Table 15

<b>HMA Compaction Sublot Size</b>	
HMA Original Plan Quantity (tons) <sup>1</sup>	Compaction Sublot Size (tons)
<20,000	100
20,000 to 30,000	150
>30,000	200

<sup>1</sup> In determining the plan quantity tonnage, do not include any tons accepted by test point evaluation.

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The following will cause one compaction lot to end prematurely and a new compaction lot to begin:

- For a compaction lot in progress with a compaction CPF less than 0.75, a new compaction lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced. See also Section 5-04.3(11)F.

All HMA which is paved on a bridge and accepted for compaction by Statistical Evaluation will compose a bridge compaction lot. If the contract includes such HMA on more than one bridge, compaction will be evaluated on each bridge individually, as separate bridge compaction lots.

Bridge compaction sublots will be determined by the Engineer subject to the following:

- All sublots on a given bridge will be approximately the same size.
- Sublots will be stratified from the lot.
- In no case will there be less than 3 sublots in each bridge compaction lot.
- No subplot will exceed 50 tons.

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- Compaction test locations will be determined by the Engineer in accordance with WSDOT FOP for AASHTO T166.

**5-04.3(10)C2 HMA Compaction Statistical Evaluation – Acceptance Testing**

Comply with Section 1-06.2(1).

The location of HMA compaction acceptance tests will be randomly selected by the Contracting Agency from within each subplot, with one test per subplot. The Contracting Agency will determine the random sample location using WSDOT Test Method T 716.

Use Table 16 to determine compaction acceptance test procedures and to allocate compaction acceptance sampling and testing responsibilities between the Contractor and the Contracting Agency. HMA cores shall be taken or nuclear density testing shall occur after completion of the finish rolling, prior to opening to traffic, and on the same day that the mix is placed.

Table 16

<b>HMA Compaction Acceptance Testing Procedures and Responsibilities</b>			
	When Contract Includes Bid Item “HMA Core – Roadway” or “HMA Core – Bridge” <sup>4</sup>	When Contract Does Not Include Bid Item “HMA Core – Roadway” or “HMA Core – Bridge” <sup>4</sup>	
Basis for Test:	Cores	Cores <sup>3</sup>	Nuclear Density Gauge <sup>3</sup>
In-Place Density Determined by:	Contractor shall take cores <sup>1</sup> using WSDOT SOP 734 <sup>2</sup> <hr/> Contracting Agency will determine core density using FOP for AASHTO T 166	Contracting Agency will take cores <sup>1</sup> using WSDOT SOP 734 <hr/> Contracting Agency will determine core density using FOP for AASHTO T 166	Contracting Agency, using WSDOT FOP for AASHTO T 355
Theoretical Maximum Density Determined by:	Contracting Agency, using FOP for AASHTO T 209		
Rolling Average of Theoretical Maximum	Contracting Agency, using WSDOT SOP 729		

Densities Determined by:			
Percent Compaction in Each Sublot Determined by:	Contracting Agency, using WSDOT SOP 736	Contracting Agency, using WSDOT SOP 736	Contracting Agency, using WSDOT FOP for AASHTO T 355

<sup>1</sup>The core diameter shall be 4-inches unless otherwise approved by the Engineer.

<sup>2</sup>The Contractor shall take the core samples in the presence of the Engineer, at locations designated by the Engineer, and deliver the core samples to the Contracting Agency.

<sup>3</sup>The Contracting Agency will determine, in its sole discretion, whether it will take cores or use the nuclear density gauge to determine in-place density. Exclusive reliance on cores for density acceptance is generally intended for small paving projects and is not intended as a replacement for nuclear gauge density testing on typical projects.

<sup>4</sup>The basis for test of all compaction sublots in a bridge compaction lot shall be cores. These cores shall be taken by the Contractor when the Proposal includes the bid item "HMA Cores – Bridge". When there is no bid item for "HMA Cores – Bridge", the Engineer will be responsible for taking HMA cores for all compaction sublots in a bridge compaction lot. In either case, the Engineer will determine core location, in-place density of the core, theoretical maximum density, rolling average of theoretical maximum density, and percent compaction using the procedure called for in this Section.

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When using the nuclear density gauge for acceptance testing of pavement density, the Engineer will follow WSDOT SOP 730 for correlating the nuclear gauge with HMA cores. When cores are required for the correlation, coring and testing will be by the Contracting Agency. When a core is taken for gauge correlation at the location of a subplot, the relative density of the core will be used for the subplot test result and is exempt from retesting.

**5-04.3(10)C3 HMA Statistical Compaction – Price Adjustments**

For each HMA compaction lot (that is accepted by Statistical Evaluation) which has less than three compaction sublots, for which all compaction sublots attain a minimum of 91 percent compaction determined in accordance with WSDOT FOP for AASHTO T 355 (or WSDOT SOP 736 when provided by the Contract), the HMA will be accepted at the unit Contract price with no further evaluation.

For each HMA compaction lot (that is accepted by Statistical Evaluation) which does not meet the criteria in the preceding paragraph, the compaction lot shall be evaluated in accordance with Section 1-06.2(2) to determine the appropriate Compaction Price Adjustment (CPA). All of the test results obtained from the acceptance samples from a given compaction lot shall be evaluated collectively. Additional testing by either a nuclear density gauge or cores will be completed as required to provide a minimum of three tests for evaluation.

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For the statistical analysis in Section 1-06.2, use the following values:

x = Percent compaction of each subplot  
USL = 100  
LSL = 91

Each CPA will be determined as follows:

$$CPA = [0.40 \times (CPF - 1.00)] \times Q \times UP$$

Where

CPA = Compaction Price Adjustment for the compaction lot (\$)  
CPF = Composite Pay Factor for the compaction lot (maximum is 1.05)  
Q = Quantity in the compaction lot (tons)  
UP = Unit price of the HMA in the compaction lot (\$/ton)

#### **5-04.3(10)C4 HMA Statistical Compaction – Requests for Retesting**

For a compaction subplot that has been tested with a nuclear density gauge that did not meet the minimum of 91 percent of the theoretical maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core, taken at the same location as the nuclear density test, be used for determination of the relative density of the compaction subplot. The relative density of the core will replace the relative density determined by the nuclear density gauge for the compaction subplot and will be used for calculation of the CPF and acceptance of HMA compaction lot. When cores are taken by the Contracting Agency at the request of the Contractor, they shall be requested by noon of the next workday after the test results for the compaction subplot have been provided or made available to the Contractor. Traffic control shall be provided by the Contractor as requested by the Engineer. Failure by the Contractor to provide the requested traffic control will result in forfeiture of the request for retesting. When the CPF for the compaction lot based on the results of the cores is less than 1.00, the Contracting Agency will deduct the cost for the coring from any monies due or that may become due the Contractor under the Contract at the rate of \$200 per core and the Contractor shall pay for the cost of the traffic control.

#### **5-04.3(10)D HMA Compaction – Visual Evaluation**

Visual Evaluation will be the basis of acceptance for compaction of the Bid items “HMA for Pavement Repair Cl. \_\_\_ PG \_\_\_” and “HMA for Prelevelling Class \_\_\_ PG \_\_\_”. This HMA shall be thoroughly compacted to the satisfaction of the Engineer. HMA that is used to prelevel wheel ruts shall be compacted with a pneumatic tire roller.

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**5-04.3(10)E HMA Compaction – Test Point Evaluation**

When compaction acceptance is by Test Point Evaluation, compact HMA based on a test point evaluation of the compaction train. Perform the test point evaluation in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

**5-04.3(10)F HMA Compaction Acceptance – Notification of Acceptance Test Results**

The obligations and responsibilities for notifying the Contractor of compaction acceptance test results are the same as for mixture acceptance test results. See Section 5-04.3(9)E.

**5-04.3(11) Reject Work**

This Section applies to HMA and all requirements related to HMA (except aggregates prior to being incorporated into HMA). For rejection of aggregate prior to its incorporation into HMA refer to Section 3-04.

**5-04.3(11)A Reject Work – General**

Work that is defective or does not conform to Contract requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer.

**5-04.3(11)B Rejection by Contractor**

The Contractor may, prior to acceptance sampling and testing, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance.

**5-04.3(11)C Rejection Without Testing (Mixture or Compaction)**

The Engineer may, without sampling, reject any batch, load, or section of Roadway that appears defective. Material rejected before placement shall not be incorporated into the pavement.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests the rejected material to be tested. If the Contractor requests testing, acceptance will be by Statistical Evaluation, and a minimum of three samples will be obtained and tested. When uncompacted material is required for testing but not available, the Engineer will determine random sample locations on the roadway in accordance with WSDOT Test Method T 716, take cores in accordance with WSDOT SOP 734, and test the cores in accordance with WSDOT SOP 737.

If the CPF for the rejected material is less than 0.75, no payment will be made for the rejected material; in addition, the cost of sampling and testing shall be borne by the Contractor. If the CPF is greater than or equal to 0.75, the cost of sampling and testing will be borne by the Contracting Agency. If the material is rejected before placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at a CPF of 0.75. If rejection occurs after placement and

1 the CPF is greater than or equal to 0.75, compensation for the rejected  
2 material will be at the calculated CPF with an addition of 25 percent of the  
3 unit Contract price added for the cost of removal and disposal.  
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5 **5-04.3(11)D Rejection – A Partial Sublot (Mixture or Compaction)**

6 In addition to the random acceptance sampling and testing, the Engineer  
7 may also isolate from a mixture or compaction sublot any material that is  
8 suspected of being defective in relative density, gradation or asphalt  
9 binder content. Such isolated material will not include an original sample  
10 location. The Contracting Agency will obtain a minimum of three random  
11 samples of the suspect material and perform the testing. When  
12 uncompacted material is required for testing but is not available, the  
13 Engineer will select random sample locations on the roadway in  
14 accordance with WSDOT Test Method T 716, take cores samples in  
15 accordance with WSDOT SOP 734, and test the material in accordance  
16 with WSDOT SOP 737. The material will then be statistically evaluated as  
17 an independent lot in accordance with Section 1-06.2(2).  
18

19 **5-04.3(11)E Rejection – An Entire Sublot (Mixture or Compaction)**

20 An entire mixture or compaction sublot that is suspected of being defective  
21 may be rejected. When this occurs, a minimum of two additional random  
22 samples from this sublot will be obtained. When uncompacted material is  
23 required for the additional samples but the material has been compacted,  
24 the Contracting Agency will take and test cores from the roadway as  
25 described in Section 5-04.3(11)D. The additional samples and the original  
26 sublot will be evaluated as an independent lot in accordance with Section  
27 1-06.2(2).  
28

29 **5-04.3(11)F Rejection - A Lot in Progress (Mixture or Compaction)**

30 The Contractor shall shut down operations and shall not resume HMA  
31 placement until such time as the Engineer is satisfied that material  
32 conforming to the Specifications can be produced when:  
33

- 34 1. the Composite Pay Factor (CPF) of a mixture or compaction lot  
35 in progress drops below 1.00 and the Contractor is taking no  
36 corrective action, or  
37
- 38 2. the Pay Factor (PF<sub>i</sub>) for any constituent of a mixture or  
39 compaction lot in progress drops below 0.95 and the Contractor  
40 is taking no corrective action, or  
41
- 42 3. either the PF<sub>i</sub> for any constituent (or the CPF) of a mixture or  
43 compaction lot in progress is less than 0.75.  
44

45 **5-04.3(11)G Rejection – An Entire Lot (Mixture or Compaction)**

46 An entire lot with a CPF of less than 0.75 will be rejected.  
47

48 **5-04.3(12) Joints**

49 **5-04.3(12)A HMA Joints**

50 **5-04.3(12)A1 Transverse Joints**

51 Conduct operations such that placement of the top or wearing course  
52 is a continuous operation or as close to continuous as possible.

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Unscheduled transverse joints will be allowed, but the roller may pass over the unprotected end of the freshly laid HMA only when the placement of the course is discontinued for such a length of time that the HMA will cool below compaction temperature. When the Work is resumed, cut back the previously compacted HMA to produce a slightly beveled edge for the full thickness of the course.

Construct a temporary wedge of HMA on a 50H:1V where a transverse joint as a result of paving or planing is open to traffic. Separate the HMA in the temporary wedge from the permanent HMA upon which it is placed by strips of heavy wrapping paper or other methods approved by the Engineer. Remove the wrapping paper and trim the joint to a slightly beveled edge for the full thickness of the course prior to resumption of paving.

Waste the material that is cut away and place new HMA against the cut. Use rollers or tamping irons to seal the joint.

#### **5-04.3(12)A2 Longitudinal Joints**

Offset the longitudinal joint in any one course from the course immediately below by not more than 6 inches nor less than 2 inches. Locate all longitudinal joints constructed in the wearing course at a lane line or an edge line of the Traveled Way. Construct a notched wedge joint along all longitudinal joints in the wearing surface of new HMA unless otherwise approved by the Engineer. The notched wedge joint shall have a vertical edge of not less than the maximum aggregate size nor more than ½ of the compacted lift thickness, and then taper down on a slope not steeper than 4H:1V. Uniformly compact the sloped portion of the HMA notched wedge joint.

On one-lane ramps a longitudinal joint may be constructed at the center of the traffic lane, subject to approval by the Engineer, if:

1. The ramp must remain open to traffic, or
2. The ramp is closed to traffic and a hot-lap joint is constructed.
  - a. Two paving machines shall be used to construct the hot-lap joint.
  - b. The pavement within 6 inches of the hot-lap joint will not be excluded from random location selection for compaction testing.
  - c. Construction equipment other than rollers shall not operate on any uncompacted HMA.

When HMA is placed adjacent to cement concrete pavement, construct longitudinal joints between the HMA and the cement concrete pavement. Saw the joint to the dimensions shown on

1 Standard Plan A-40.10 and fill with joint sealant meeting the  
2 requirements of Section 9-04.2.

3  
4 **5-04.3(12)B Bridge Paving Joint Seals**

5 **5-04.3(12)B1 HMA Sawcut and Seal**

6 Prior to placing HMA on the bridge deck, establish sawcut alignment  
7 points at both ends of the bridge paving joint sealsto be placed at the  
8 bridge ends, and at interior joints within the bridge deck when and  
9 where shown in the Plans. Establish the sawcut alignment points in a  
10 manner that they remain functional for use in aligning the sawcut after  
11 placing the HMA overlay.

12  
13 Submit a Type 1 Working Drawing consisting of the sealant  
14 manufacturer's application procedure.

15  
16 Construct the bridge paving joint seal as specified in the Plans and in  
17 accordance with the detail shown in the Standard Plans. Construct  
18 the sawcut in accordance with Section 5-05.3(8). Apply the sealant in  
19 accordance with Section 5-05.3(8)B and the manufacturer's  
20 application procedure.

21  
22 **5-04.3(12)B2 Paved Panel Joint Seal**

23 Construct the paved panel joint seal in accordance with the  
24 requirements specified in Section 5-04.3(12)B1 and the following  
25 requirement:

- 26  
27 1. Clean and seal the existing joint between concrete panels in  
28 accordance with Section 5-01.3(8) and the details shown in  
29 the Standard Plans.

30  
31 **5-04.3(13) Surface Smoothness**

32 The completed surface of all courses shall be of uniform texture, smooth,  
33 uniform as to crown and grade, and free from defects of all kinds. The  
34 completed surface of the wearing course shall not vary more than  $\frac{1}{8}$  inch from  
35 the lower edge of a 10-foot straightedge placed on the surface parallel to the  
36 centerline. The transverse slope of the completed surface of the wearing  
37 course shall vary not more than  $\frac{1}{4}$  inch in 10 feet from the rate of transverse  
38 slope shown in the Plans.

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40 When deviations in excess of the above tolerances are found that result from  
41 a high place in the HMA, correct the pavement surface by one of the  
42 following methods:

- 43  
44 1. Remove material from high places by grinding with an approved  
45 grinding machine, or  
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47 2. Remove and replace the wearing course of HMA, or  
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49 3. By other method approved by the Engineer.

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51 Correct defects until there are no deviations anywhere greater than the  
52 allowable tolerances.

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Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Engineer, will not produce satisfactory results will be accepted with a price adjustment. The Engineer shall deduct from monies due or that may become due to the Contractor the sum of \$500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

When portland cement concrete pavement is to be placed on HMA, the surface tolerance of the HMA shall be such that no surface elevation lies above the Plan grade minus the specified Plan depth of portland cement concrete pavement. Prior to placing the portland cement concrete pavement, bring any such irregularities to the required tolerance by grinding or other means approved by the Engineer.

When utility appurtenances such as manhole covers and valve boxes are located in the Traveled Way, pave the Roadway before the utility appurtenances are adjusted to the finished grade.

**5-04.3(14) Planing Bituminous Pavement**

Plane in such a manner that the underlying pavement is not torn, broken, or otherwise damaged by the planing operation. Delamination or raveling of the underlying pavement will not be construed as damage due to the Contractor's operations. Pavement outside the limits shown in the Plans or designated by the Engineer that is damaged by the Contractor's operations shall be repaired to the satisfaction of the Engineer at no additional cost to the Contracting Agency.

For mainline planing operations, use equipment with automatic controls and with sensors for either or both sides of the equipment. The controls shall be capable of sensing the grade from an outside reference line, or a mat-referencing device. The automatic controls shall have a transverse slope controller capable of maintaining the mandrel at the desired transverse slope (expressed as a percentage) within plus or minus 0.1 percent.

Remove all loose debris from the planed surface before opening the planed surface to traffic. The planings and other debris resulting from the planing operation shall become the property of the Contractor and be disposed of in accordance with Section 2-03.3(7)C, or as otherwise allowed by the Contract.

**5-04.3(15) Sealing Pavement Surfaces**

Apply a fog seal where shown in the Plans. Construct the fog seal in accordance with Section 5-02.3. Unless otherwise approved by the Engineer, apply the fog seal prior to opening to traffic.

**5-04.3(16) HMA Road Approaches**

Construct HMA approaches at the locations shown in the Plans or where staked by the Engineer, in accordance with Section 5-04.

1 **5-04.4 Measurement**

2 HMA Cl. \_\_\_\_ PG \_\_\_\_, HMA for \_\_\_\_ Cl. \_\_\_\_ PG \_\_\_\_, and Commercial HMA will  
3 be measured by the ton in accordance with Section 1-09.2, with no deduction being  
4 made for the weight of asphalt binder, mineral filler, or any other component of the HMA.  
5 If the Contractor elects to remove and replace HMA as allowed by Section 5-04.3(11),  
6 the material removed will not be measured.

7  
8 Roadway cores will be measured per each for the number of cores taken.

9  
10 Crack Sealing-LF will be measured by the linear foot along the line of the crack.

11  
12 Soil residual herbicide will be measured by the mile for the stated width to the nearest  
13 0.01 mile or by the square yard, whichever is designated in the Proposal.

14  
15 Pavement repair excavation will be measured by the square yard of surface marked  
16 prior to excavation.

17  
18 Asphalt for fog seal will be measured by the ton, as provided in Section 5-02.4.

19  
20 Longitudinal joint seals between the HMA and cement concrete pavement will be  
21 measured by the linear foot along the line and slope of the completed joint seal.

22  
23 HMA sawcut and seal, and paved panel joint seal, will be measured by the linear foot  
24 along the line and slope of the completed joint seal.

25  
26 Planing bituminous pavement will be measured by the square yard.

27  
28 Temporary pavement marking will be measured by the linear foot as provided in Section  
29 8-23.4.

30  
31 Water will be measured by the M gallon as provided in Section 2-07.4.

32  
33 **5-04.5 Payment**

34 Payment will be made for each of the following Bid items that are included in the  
35 Proposal:

36  
37 "HMA Cl. \_\_\_\_ PG \_\_", per ton.

38 "HMA for Approach Cl. \_\_\_\_ PG \_\_", per ton.

39 "HMA for Preleveling Cl. \_\_\_\_ PG \_\_", per ton.

40 "HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_", per ton.

41 "Commercial HMA", per ton.

42 The unit Contract price per ton for "HMA Cl. \_\_\_\_ PG \_\_", "HMA for Approach Cl.  
43 \_\_\_\_ PG \_\_", "HMA for Preleveling Cl. \_\_\_\_ PG \_\_", "HMA for Pavement Repair Cl.  
44 \_\_\_\_ PG \_\_", and "Commercial HMA" shall be full compensation for all costs,  
45 including anti-stripping additive, incurred to carry out the requirements of Section 5-  
46 04 except for those costs included in other items which are included in this  
47 Subsection and which are included in the Proposal.

48  
49 "Crack Sealing-FA", by force account.

50 "Crack Sealing-FA" will be paid for by force account as specified in Section 1-09.6.  
51 For the purpose of providing a common Proposal for all Bidders, the Contracting

1 Agency has entered an amount in the Proposal to become a part of the total Bid by  
2 the Contractor.  
3  
4 “Crack Sealing-LF”, per linear foot.  
5 The unit Contract price per linear foot for “Crack Sealing-LF” shall be full payment  
6 for all costs incurred to perform the Work described in Section 5-04.3(4)A.  
7  
8 “Soil Residual Herbicide \_\_\_\_ ft. Wide”, per mile, or  
9 “Soil Residual Herbicide”, per square yard.  
10 The unit Contract price per mile or per square yard for “Soil Residual Herbicide”  
11 shall be full payment for all costs incurred to obtain, provide and install herbicide in  
12 accordance with Section 5-04.3(4)B.  
13  
14 “Pavement Repair Excavation Incl. Haul”, per square yard.  
15 The unit Contract price per square yard for “Pavement Repair Excavation Incl.  
16 Haul” shall be full payment for all costs incurred to perform the Work described in  
17 Section 5-04.3(4)C with the exception, however, that all costs involved in the  
18 placement of HMA shall be included in the unit Contract price per ton for “HMA for  
19 Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_”, per ton.  
20  
21 “Asphalt for Fog Seal”, per ton.  
22 Payment for “Asphalt for Fog Seal” is described in Section 5-02.5.  
23  
24 “Longitudinal Joint Seal”, per linear foot.  
25 The unit Contract price per linear foot for “Longitudinal Joint Seal” shall be full  
26 payment for all costs incurred to construct the longitudinal joint between HMA and  
27 cement concrete pavement, as described in Section 5-04.3(12)B.  
28  
29 “HMA Sawcut And Seal”, per linear foot.  
30 The unit Contract price per linear foot for “HMA Sawcut And Seal” shall be full  
31 payment for all costs incurred to perform the Work described in Section 5-  
32 04.3(12)B1.  
33  
34 “Paved Panel Joint Seal”, per linear foot.  
35 The unit Contract price per linear foot for “Paved Panel Joint Seal” shall be full  
36 payment for all costs incurred to perform the Work described in Section 5-  
37 04.3(12)B2.  
38  
39 “Planing Bituminous Pavement”, per square yard.  
40 The unit Contract price per square yard for “Planing Bituminous Pavement” shall be  
41 full payment for all costs incurred to perform the Work described in Section 5-  
42 04.3(14).  
43  
44 “Temporary Pavement Marking”, per linear foot.  
45 Payment for “Temporary Pavement Marking” is described in Section 8-23.5.  
46  
47 “Water”, per M gallon.  
48 Payment for “Water” is described in Section 2-07.5.  
49  
50 “Job Mix Compliance Price Adjustment”, by calculation.  
51 “Job Mix Compliance Price Adjustment” will be calculated and paid for as described  
52 in Section 5-04.3(9)B6 and 5-04.3(9)D1.

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“Compaction Price Adjustment”, by calculation.

“Compaction Price Adjustment” will be calculated and paid for as described in Section 5-04.3(10)C3.

“HMA Core – Bridge”, per each.

The unit Contract price per each for “HMA Core – Bridge” shall be full payment for all costs, including traffic control, associated with taking HMA density cores in pavement that is on a bridge deck.

“HMA Core – Roadway”, per each.

The unit Contract price per each for “HMA Core – Roadway” shall be full payment for all costs, including traffic control, associated with taking HMA density cores in pavement that is not on a bridge deck.

“Cyclic Density Price Adjustment”, by calculation.

“Cyclic Density Price Adjustment” will be calculated and paid for as described in Section 5-04.3(10)B.