

## Proposed Special Provision for Porous Hot Mix Asphalt

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### Porous Hot Mix Asphalt

#### Description

Section 5-04.1 is supplemented with the following:

This Work shall consist of providing and placing one or more layers of plant-mixed porous hot mix asphalt (PHMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans or established by the Engineer. The manufacture of PHMA may include porous warm mix asphalt (PWMA) processes in accordance with these Specifications. PWMA processes include organic additives, chemical additives, and foaming. PHMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

Work shall also include preparation and protection of subgrade, subbase and leveling course specific to PHMA.

#### Materials

Section 5-04.2 is supplemented with the following:

The aggregate for PHMA shall conform to the following gradation:

Sieve Size	Percent Passing
¾" square	100
½" square	90 - 100
3/8" square	55 - 90
U.S. No. 4	10 - 40
U.S. No. 8	0 - 20
U.S. No. 40	0 - 13
U.S. No. 200	0 - 5

The aggregate should consist of crushed stone with a percent fracture greater than 90% on two faces on the No. 4 sieve and above, when tested in accordance with the field operating procedures for AASHTO T 335.

Recycled asphalt pavement shall not be used in PHMA.

1 Mix Designs for PHMA shall be submitted to the Project Engineer on Washington State DOT  
2 Form 350-042 with the additional PHMA test data required by this specification provided as a  
3 one page supplemental attachment.

4  
5 The anti-stripping requirements for PHMA shall be equivalent to the anti-stripping requirement  
6 for same maximum nominal aggregate class of dense graded HMA design from the same  
7 aggregate materials source.

#### 8 9 **Construction Requirements**

10 Section 5-04.3 is supplemented with the following:

#### 11 12 **5-04.3(1) HOT MIX ASPHALT MIXING PLANT**

13 This section is supplemented with the following:

14 Plants used for preparation of HMA and PHMA shall conform to the following requirements:

#### 15 16 **Fiber Supply System**

17 When fiber stabilizing additives are used for PHMA (if needed to achieve the drain down  
18 specification), a separate feed system that meets the following will be required:  
19 Accurately proportions by weight the required quantity into the mixture in such a manner that  
20 uniform distribution will be obtained.

21  
22 The fibers shall be uniformly distributed prior to the injection of the asphalt binder into the  
23 mixture.

24  
25 When a continuous or drier-drum type plant is used, the fiber shall be added to the aggregate  
26 and uniformly dispersed prior to the injection of asphalt binder.

#### 27 28 **Surge and Storage Systems**

29 The storage time for PHMA mixtures not hauled immediately to the project shall be no more  
30 than four (4) hours for non-insulated silos or eight (8) hours for insulated silos. Placement  
31 temperature specifications shall still be met regardless of silo storage time.

#### 32 33 **5-04.3(2) Hauling Equipment**

34 The temperature of the mix at the time of discharge from the haul vehicle shall be within the  
35 temperature range identified in the approved PHMA.

#### 36 37 **5-04.3(7)A Mix Design**

38 Section 5-04.3(7)A is supplemented with the following for Porous HMA:

39  
40 The asphalt binder for PHMA shall be PG 70-22ER polymer modified or higher grade. Binder  
41 content shall be between 6.0% and 7.0% by total weight of the mix, and will be the highest  
42 percentage that passes both the drain down and void requirements tests at  $N_{design} = 75$  gyrations.  
43 The binder content tolerance shall be  $\pm 0.3\%$  during production/ placement of the PHMA. The  
44 contractor shall adjust the aggregate to meet the maximum drain down test requirements within  
45 the ranges provided in section 9-03.8.

- 46 • Drain down shall be 0.3 %, maximum, according to ASTM D6390-05.
- 47 • Void ratio shall be 16% to 25% per ASTM D3203 at  $N_{design} = 75$  gyrations.
- 48

**Note to Engineer:** A typical Temperature Range would be  
250-275°F for Warm Mix Asphalt (WMA)  
275-300°F for Hot Mix Asphalt (HMA)

1 The contractor shall include in the submittal letter from the polymer-modified asphalt supplier the  
2 recommended mixing, delivery, and compaction temperatures.

3  
4 The Contractor shall determine anti-strip requirements for PHMA and provide data for anti-  
5 stripping. The asphaltic mix shall be tested for its resistance to stripping by water in accordance  
6 with ASTM D-3625. If the estimated coating area is not above 95 percent, anti-stripping agents  
7 shall be added to the asphalt. Contractor shall be responsible for conducting the anti-stripping  
8 evaluation and providing a report to the Engineer.  
9

#### 10 **5-04.3(8)A Acceptance Sampling and Testing – HMA Mixture**

11 Section 5-04.3(8)A is supplemented with the following:

12 Commercial evaluation will be the basis for acceptance of PHMA.

#### 13 **Spreading and Finishing**

14 Section 5-04.3(9) is supplemented with the following:

15 Placement temperature of the mixture shall be within the temperature range identified in the  
16 approved PHMA submittal.

#### 17 **Compaction**

18 Section 5-04.3(10)A is supplemented with the following for PHMA:

19 Pneumatic tire rollers shall not be used.

20 The Contractor will develop a roller pattern that will initially consolidate the pavement  
21 structure as well as target 15% to 18% final air voids (82% to 85% of maximum theoretical  
22 (Rice) density). The Contractor shall monitor compaction during placement of PHMA with  
23 a pavement density gage.

#### 24 **5-04.3(21) Porous Asphalt (PHMA) Acceptance Infiltration Test**

25 Section 5-04.3(10)A is added:

26 Contractor shall conduct infiltration tests on the finished PHMA per ASTM C1701 at locations  
27 chosen by the Engineer. Newly-placed PHMA should be able to accommodate a minimum  
28 infiltration rate of 100 inches/hour. It is anticipated that infiltration tests be completed every 150  
29 linear feet of roadway and conducted in accordance with ASTM C1701.

30 If the measured infiltration rate is less than 100 inches /hour, conduct additional four additional  
31 tests as follows in line with the paver direction of travel. Two tests upstream and two tests  
32 downstream of the initial test locations shall be taken at distances of 20 feet and 40 feet. Results  
33 of the additional tests should be averaged. Conduct additional testing upstream and downstream  
34 to identify area to be removed. If the average infiltration rate is less than required remove and  
35 replace at the direction of the Engineer and at no cost to the Owner.

#### 36 **Measurement**

37 Section 5-04.4 is supplemented with the following:

38 PHMA PG 70-22 ER (or higher) shall be measured by the ton in accordance with Section 1-09.2,  
39 with no deduction being made for the weight of asphalt binder, blending sand, mineral filler, or any  
40

**Note to Engineer:** Typical Range  
225-250° F for Warm Mix Asphalt (WMA)  
250-275° F for Hot Mix Asphalt (HMA)

**Note to Engineer:**  
Prior Successful projects have incorporated two initial low  
amplitude roller passes followed by static rolling to create a  
final surface without roller marks.

1 other component of the HMA. If the contractor elects to remove and replace mix as allowed in  
2 Section 5-04.3(11), the material removed will not be measured.

3

4 **Payment**

5 Section 5-04.5 is supplemented with the following:

6

7 "Porous HMA CL. 1/2" In. PG 70-22ER", per ton

8

9 The unit Contract price per ton for "Porous HMA CL. 1/2 In. PG 70-22ER" shall be full compensation  
10 for all costs, including anti-stripping additive, incurred to carry out requirements of Section 5-04  
11 except for those costs included in other items which are included in this subsection and which are  
12 included in the proposal.

This is a proposed special provision for porous hot mix asphalt. This specification is currently being finalized.

Please email Tim Horton at [THorton@Skillings.com](mailto:THorton@Skillings.com) for the most current special provision.

**Porous Asphalt Pavement Design Data Summary**

<b>HMA Mix Design Data</b>					
HMA Properties	Primary Asphalt Binder				
Percent Binder (Pb), by total mix wt	<b>6.0%</b>	<b>6.2%</b>	<b>6.4%%</b>		
% VA					
Gmm (RICE)					
Gmb					
Draindown %, ASTM D6390-05 at anticipated production Temp. (305 F)					
Draindown %, ASTM D6390-05 15 °C above anticipated production Temp. (320 F)					

**Contractor Mix Design Proposal**

HMA Properties	Primary Asphalt Binder Target *	Requirements
Percent Binder (Pb), by total mix wt		6.0% min. but as great as draindown will allow
% VA		16.0 min.
Gmm (RICE)		
Gmb		
Draindown %, ASTM D6390-05 at anticipated production Temp. (305 F)		0.3.% max.
Draindown %, ASTM D6390-05 15 °C above anticipated production Temp. (320 F)		0.3.% max.

Remarks:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Laboratory Manager  
Title

\_\_\_\_\_  
Date