

DESCRIPTION

This work shall consist of developing a Rubber-Modified HMA mixture and constructing it in accordance with the contract documents and as directed by the Engineer. This mixture requires the use of *Tack Coat for 6.3-mm Polymer-Modified HMA*, as the tack coat.

MATERIALS

The materials and composition for Rubber-Modified mixtures shall meet the requirements specified in §401-2 Materials, except as noted herein.

Produce Rubber-Modified HMA in accordance with the procedures outlined in this specification and Material Method 5.16, Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures, except as modified below:

Formulate and submit to the Regional Materials Engineer a Rubber-Modified HMA design, which satisfies design criteria outlined in this specification. The minimum PG Binder content shall not be less than 6.0%.

6.3-mm Rubber-Modified HMA Design Control Points		
Standard Sieves (mm)	Percent Passing Criteria	
	Maximum	Minimum
9.5		100
6.30	100	90
4.75	90	---
2.36	70	37
0.075	10	2

6.3-mm Rubber-Modified HMA Mixture Additional Aggregate Criteria			
Coarse Aggregate Angularity (Percent), minimum	Uncompacted Void Content of Fine Aggregate (Percent), minimum	Flat-and-elongated Particles (Percent), maximum	Sand Equivalent (Percent), minimum
95/90	43	10	45

6.3-mm Polymer-Modified HMA Volumetric Design Criteria					
% Gmm @ N_{Initial}	% Gmm @ N_{Design}	% Gmm @ N_{Max}	% Voids Filled with Binder		% Voids in the Mineral Aggregate, minimum
			minimum	maximum	
< 89.0	96.0	≤ 98.0	70	78	16

6.3-mm Polymer-Modified HMA Design Number of Gyration			
Compactive Effort	N_{Initial}	N_{Design}	N_{Maximum}
Number of Gyration	7	75	115

ITEM 402.06720102 6.3-mm F2 RUBBER-MODIFIED HMA, 70 SERIES COMPACTION
ITEM 402.06721102 PLANT PRODUCTION QUALITY ADJUSTMENT TO 402.06720102

6.3-mm Rubber-Modified HMA Production Gradation Tolerances									
Sieve Size (mm)	9.5	6.3	4.75	2.36	1.18	0.600	0.300	0.150	0.075
Tolerance	± 4	± 4	± 3	± 3	± 3	± 2	± 2	± 2	± 2

Coarse Aggregate Type F2 Conditions

1. Limestone, dolomite, or a blend of the two having an acid insoluble residue content of not less than 20.0%.
2. Sandstone, granite, chert, traprock, ore tailings, slag, or other similar noncarbonated materials.
3. Use gravel or blend two or more of: gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, or other similar materials to produce a final blend of which the noncarbonate plus 2.36-mm particles must comprise at least 10.0% of the total aggregate. In addition, at least 20.0% of the plus 4.75-mm particles must be noncarbonate.

PG Binder. Use a terminal-blend tire-rubber modified Performance Graded (PG) Binder PG 64-22 during the production of Superpave Hot Mix Asphalt (HMA) mixtures for the locations noted in the proposal on this project. The PG Binder shall meet the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder and Elastic Recovery requirements as shown in the table below:

TEST ON THE ROLLING THIN FILM OVEN (RTFO) BINDER SAMPLE

Test	Requirements
Elastic Recovery using ASTM D6084-04, Testing Procedure A, at 25°C	60% minimum

1. Section 5.5 of AASHTO M320 is waived for this PG Binder

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited. This prohibition also applies to the use of PPA as a cross-linking agent for modification.

Reclaimed Asphalt Pavement (RAP). The maximum RAP blend portion is 20% by mass of the total mixture.

CONSTRUCTION DETAILS

The provisions of §401-3 and §402-3, Construction Details, will apply except as modified herein.

Use *Tack Coat for 6.3-mm Polymer-Modified HMA*, as a tack coat.

Report the air void test values to the nearest 0.01 of a percent and aggregate gradation test values to the nearest 0.1 of a percent. When determining test result acceptability, the air void test value is referenced to the mix design median of 4.00 percent and the gradation test value is referenced to the Job Mix Formula (JMF) target value.

METHOD OF MEASUREMENT

The provisions of §401-4 and §402-4, Method of Measurement, shall apply except as modified herein.

When any material with plant air voids of less than 2% or greater than 6% which results in daily QAF of 0.85, the Engineer will evaluate the subject material to determine if it will be left in place. The considerations for determining whether the material in question is left in place are, but not limited to:

- Type of material produced.
- The layer in which the material was placed.
- The location of the project.

Use the Air Voids in Plant Mixture table to determine the Quality Adjustment Factor (QAF) in accordance with §401-4, Method of Measurement.

AIR VOIDS IN PLANT MIXTURE (Volumetric Designs)	
Average Absolute Value (Test Value - 4.0)	Quality Adjustment Factor (QAF)
0.00 - 0.17	1.05
0.18 - 0.33	1.04
0.34 - 0.50	1.03
0.51 - 0.67	1.02
0.68 - 0.83	1.01
0.84 - 1.00	1.00
1.01 - 1.10	0.99
1.11 - 1.20	0.98
1.21 - 1.30	0.97
1.31 - 1.40	0.96
1.41 - 1.50	0.95
1.51 - 1.60	0.94
1.61 - 1.70	0.93
1.71 - 1.80	0.92
1.81 - 1.90	0.91
1.91 - 2.00	0.90
over 2.00	0.85

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Delivery Ticket Mix Coding ²								
Mix Type	Code	Code ¹	Design ESAL	Code	Consensus Properties	Code	PG Binder Type	Code
6.3-mm	06	F1	<3.0 million	2	<100 mm	Y	PG 64-22	B
----	----	F2	----	----	----	----	PG 76-22	E
----	----	F3	----	----	----	----	----	----

Notes:

1. Friction Aggregate Classification Codes
2. Delivery Ticket Mix Coding Example: 6.3-mm, Type F2 friction requirements, PG 64-22 with a minimum of 60% Elastic Recovery - Mix Coding on Delivery Ticket: **06F22YB**.

BASIS OF PAYMENT

The provisions of §402-5 Basis of Payment shall apply.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
402.06720102	6.3-mm F2 Rubber-Modified HMA, 70 Series Compaction	Metric Ton
402.06721102	Plant Production Quality Adjustment to 402.06720102	Quality Unit