



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Janet T. Mills
GOVERNOR

Bruce A. Van Note
COMMISSIONER

February 17, 2021
Subject: Pavement Milling, Asphalt
Rubber Gap-Graded Overlay, with
Drainage & Safety Improvements
State WINs: 022420.00
Location: **Portland & South Portland
Amendment No. 2**

Dear Sir/Ms.:

Please make the following changes to The Bid Documents:

In the Bid Book:

CHANGE on page 14, NOTICE TO CONTRACTORS, the bid opening dated from "February 17, 2021", to read "**February 24, 2021**". Make this change in pen and ink.

REMOVE page 82, SPECIAL PROVISION – SECTION 105 – GENERAL SCOPE OF WORK – (Limitations of Operations), 1 page, dated January 5, 2021, and **REPLACE** with the attached, revised SPECIAL PROVISION – SECTION 105 – GENERAL SCOPE OF WORK – (Limitations of Operations), 1 page, dated February 12, 2021.

REMOVE from Amendment No. 1, SPECIAL PROVISION – SECTION 401 - HOT MIX ASPHALT PAVEMENTS – (HMA – Asphalt Rubber Gap-Graded), 5 pages, dated February 11, 2021 and **REPLACE** with the attached, revised SPECIAL PROVISION – SECTION 401 - HOT MIX ASPHALT PAVEMENTS – (HMA – Asphalt Rubber Gap-Graded), 5 pages, dated February 12, 2021.

Consider these changes and information prior to submitting your bid on **February 24, 2021**.

Sincerely,

George M. A. Macdougall P.E.
Contracts & Specifications Engineer

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(LIMITATIONS OF OPERATIONS)

1. Interstate Crossovers shall not be allowed to be utilized to change direction. Existing Crossovers shall be closed, throughout the entire length of the project, utilizing drums during construction activities. Crossovers may not be used for storage areas. The contractor will not be allowed to park vehicles in crossovers at any time. These crossovers will be opened at the end of activities for the shift.
2. The maximum length of lane closure is 2.0 miles in length.
3. The Contractor may utilize multiple milling/paving crews as long as applicable sections of Special Provision 652 are met, provided the Resident is given 72 hours notice.
4. All pipe and rental items shall be completed in an area prior to the contractor commencing placement of HMA surface in a given area. Daytime travel lane shoulder closures will be allowed provided there is no infringement upon mainline traffic. This work shall require approval from the Resident. Shoulder closures will not be permitted while any opposite lane is closed.
5. Milling and or paving shall be matched up prior to the weekend or holidays.
6. All reduced work zone speeds shall be covered or removed when lane closures are removed, or no work is present.

SPECIAL PROVISION
SECTION 401
HOT MIX ASPHALT PAVEMENTS
(HMA – Asphalt Rubber Gap-Graded)

The Special Provision 400 – Pavements; Section 401 – Hot Mix Asphalt Pavements; the following subsections have been modified with the following:

Description The Contractor shall furnish and place one or more courses of HMA – Asphalt Rubber Gap-Graded (HMA-ARGG) pavement on an approved base in accordance with the contract documents and in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established. The Department will accept this work under Quality Assurance provisions, in accordance with these specifications and the requirements of Section 106 – Quality, the provisions of AASHTO M 323 except where otherwise noted in sections 401 and 703 of these specifications, and the MaineDOT Policies and Procedures for HMA Sampling and Testing. The Asphalt Rubber Gap-Graded HMA shall meet all of the Materials, Seasonal Limitations, Equipment, and Construction requirements of Special Provision Section 401, with the following additions and changes.

401.03 Composition of Mixtures The specimens shall be prepared in accordance with AASHTO M323 and R35. The Contractor may not use RAP in the HMA-ARGG mixture at any percentage. The HMA-ARGG mix shall conform to the gradation requirements detailed in Table 1:

TABLE 1: HMA-ARGG MIX GRADATION REQUIREMENTS

Sieve Designation	Percent Passing
19.0 mm (3/4")	100
12.5 mm (1/2")	90-100
9.5 mm (3/8")	83-87
4.75 mm (#4)	28-42
2.36 mm (#8)	14-24
0.075 mm (#200)	0.0-6.0

The mix design will satisfy the following criteria:

TABLE 2: HMA-ARGG VOLUMETRIC DESIGN CRITERIA

Property	Criteria
Air Voids	4.5% +/-1.5%
Voids in Mineral Aggregates (VMA)	18.0 % minimum
Draindown	0.3 % maximum
% Binder content	7.6 % minimum
<u>HWT, Rut Depth (20,000 passes) @ 50°C</u>	<u>12.5mm maximum</u>
<u>HWT, Stripping Inflection Point (SIP)</u>	<u>15,000 minimum</u>

401.031 Hamburg Wheel Tracker (HWT) Before the start of paving, the Contractor shall provide the Department with **four boxes** of the proposed plant or lab produced asphalt mixture for HWT approval. The mixture will be tested for rutting and moisture sensitivity in the Hamburg Wheel Tracker according to AASHTO T324, “Hamburg Wheel-Track Testing of Hot Mix Asphalt (HMA).” If the sample meets the requirements of Table 2, an approved JMF will be forwarded to the Contractor with a comment referencing the passing HWT reference number. The Department will have five business days from receipt of the sample at the Central Laboratory to process, test, and report the Hamburg Wheel Tracker sample. The first day’s

production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement.

401.032 Warm Mix Technology The HMA-ARGG shall be modified using an approved Warm-Mix Asphalt (WMA) additive that may reduce compactive effort and emissions. No WMA foaming technology will be permitted which requires the mechanical injection of steam or water into the liquid asphalt. The WMA additive must be compatible with polyphosphoric acid modified and polymer modified asphalts. The WMA additive shall be introduced in accordance with the Manufacturer's dosing rates and approved blending methods.

401.04 Temperature Requirements After the JMF is established, the temperatures of the mixture shall conform to the following tolerances unless otherwise authorized by the Department:

In the truck at the mixing plant – allowable range 290° to 340°F

At the Paver – allowable range 290° to 340°F

401.05 Performance Graded Asphalt Binder The base Performance Graded Asphalt Binder (PGAB) shall have a PG Grading of **PG 58-28**. The supplier may substitute **PG 64-28** where needed to meet the requirements of ASTM D 6114 (type II). The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. All Performance Graded Asphalt Binder shall conform to the requirements of AASHTO M 320.

The physical requirements for the asphalt-rubber binder shall conform to ASTM D 6114 type II specifications. The minimum percentage of granulated rubber by weight of total asphalt-rubber binder is 15%. The reclaimed vulcanized rubber shall be produced primarily from the processing of automobile and truck tires. The rubber shall be produced by ambient temperature grinding processes only. The specific gravity of reclaimed vulcanized ground rubber shall be not less than 1.10 nor greater than 1.20. Rubber for use in asphalt-rubber binder shall be free of loose fabric, wire and other contaminants except that up to 4 percent (by weight of rubber) calcium carbonate or talc may be added to prevent caking or sticking of the particles together. The rubber shall be sufficiently dry to be free flowing and not produce foaming when blended with the hot paving asphalt.

At least three weeks before its intended use, the Contractor shall furnish samples of the asphalt-rubber binder proposed for use on the project. The samples shall consist of 4 one-quart size cans of the asphalt-rubber binder, together with the formulation and the PG binder used. The method and equipment for combining the rubber and PG binder shall be so designed and accessible that the Inspector can readily determine the percentage by weight for each material being incorporated into the mixture. Equipment utilized in the production and proportioning of asphalt-rubber binder shall include the following:

- An asphalt heating tank with hot oil heat transfer to heat the paving asphalt to the necessary temperature before blending with the granulated rubber. This unit shall be equipped with a thermostatic heat control device.
- A mechanical blender for proper proportioning and thorough mixing of the PG binder and rubber. This unit shall have both an asphalt totalizing meter (gallons or liters) and a flow rate meter (gallons per minute or liters per minute).
- An asphalt-rubber binder storage tank equipped with a heating system to maintain the proper temperature of the binder and an internal mixing unit capable of maintaining a homogeneous mixture of asphalt and rubber.

401.07 Hot Mix Asphalt Plant The asphalt-rubber binder shall be reacted for a minimum of 45 minutes prior to its metering into the mixing chamber of the asphalt concrete production plant at the percentage determined

by the Engineer. When batch type asphalt concrete plants are used to produce the rubberized asphalt concrete, the asphalt-rubber binder and mineral aggregate shall be proportioned by weight. When continuous mixing type HMA plants are used to produce the rubberized asphalt concrete, the asphalt-rubber binder shall be proportioned by an asphalt meter of the mass flow, coriolis effect type.

401.19 Quality Control - Method A, B, C & D The Contractor shall have a testing lab at the plant site, equipped with all testing equipment necessary to complete the tests in Table 3. The Contractor shall locate an approved Gyratory Compactor at the plant testing lab. The Contractor shall generate QC sampling random numbers for each approved mix design. A copy of the random numbers shall be emailed to the QC.mainedot@maine.gov email address and remain on-file (in print) and be available for inspection at the QC laboratory. The Contractor shall sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with the following minimum frequencies per each approved mix design:

TABLE 3: MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Temperature of mix	6 per day at street and plant	-
Temperature of mat	4 per day	-
%TMD (Surface)	1 per 125 ton	AASHTO T 355 or AASHTO T 343
%TMD (Base)	1 per 250 ton	AASHTO T 355 or AASHTO T 343
Fines / Effective Binder	1 per 500 ton	AASHTO T 312
Gradation	1 per 500 ton	AASHTO T 30
PGAB content	1 per 500 ton	AASHTO T164 or AASHTO T 308
Voids at N_{design}	1 per 500 ton	AASHTO T 312
Voids in Mineral Aggregate at N_{design}	1 per 500 ton	AASHTO T 312
Rice Specific Gravity	1 per 500 ton	AASHTO T 209
Coarse Aggregate Angularity	1 per 5,000 ton	ASTM D5821
Flat and Elongated Particles	1 Per 5,000 ton	ASTM D4791
Fine Aggregate Angularity	1 Per 5,000 ton	AASHTO T 304
<u>Hamburg Wheel Tracker</u>	<u>1 Per 4,000 ton and at least once per Acceptance Lot</u>	<u>AASHTO T 324</u>

The Contractor shall monitor plant production on each approved mix design using running average of three control charts as specified in Section 106 - Quality. Control limits shall be as noted in Table 4 below. The UCL and LCL, shall not exceed the allowable gradation control points for the particular type of mixture as outlined in Table 1 of Section 703.0

Hamburg Wheel Tracker (HWT) The project specific QCP shall address the sampling, transport, and testing of Hamburg Wheel Tracker QC samples and what potential steps will be taken if QC samples do not meet the requirements in Table 2. The project specific QCP shall also contain a sample Hamburg Wheel Tracker test report for approval. The Contractor shall sample and test HMA Pavement in the Hamburg Wheel Tracker according to AASHTO T324 in accordance with the minimum frequencies listed in Table 3.

The Contractor shall sample the HMA on the first day of production and test the sample in the Hamburg Wheel Tracker according to AASHTO T324. This sample will not count towards the minimum quality control frequency specified in Table 3. The Contractor shall submit all Hamburg Wheel Tracker test reports in writing, signed by the appropriate technician and present them to the Department within ten working days

of initial sampling, except when otherwise noted in the project specific QCP due to local restrictions. The Contractor shall make the raw Hamburg Wheel Tracker data from QC samples available to the Department upon request. If a QC sample fails to meet the criteria in Table 2, the Contractor will be required to submit a corrective action letter to the Resident, Materials Engineer, Pavement Quality Manager, and Pavement Quality Engineer by the end of the following working day with the proposed changes to bring the mixture back into compliance. The Department will respond and either accept or reject the Contractor's proposed corrective action by the end of the following working day from when the letter was received.

401.20 Acceptance Method The Contractor shall cease paving operations whenever the following occurs on a lot in progress:

- a. The Pay Factor for VMA, Voids @ Nd, Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance tests for the current lot is less than 0.85.
- b. The Pay Factor for Percent PGAB, percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, percent passing 0.075 mm sieve or density using all Acceptance tests for the current lot is less than 0.85.
- c. The Acceptance Sample fails to meet the Hamburg Wheel Tracker requirements from Table 2.

The Department shall sample the HMA on the first day of production and test the sample in the Hamburg Wheel Tracker according to AASHTO T324. This sample will not count towards the minimum quality assurance frequencies specified in Table 4A. On the first day of production, and for all QA samples identified as a HWT sample, the Department will collect four additional boxes of the HMA mixture to verify compliance with the HWT requirements, The minimum sampling shall be as specified in Table 4A.

If a verification sample fails to meet the criteria in Table 2, the Contractor will be required cease production and submit a corrective action letter to the Resident, Materials Engineer, Pavement Quality Manager, and Pavement Quality Engineer by the end of the following working day with the proposed changes to bring the mixture back into compliance.

No ceasing of paving operations shall be required for percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, or percent passing 0.075 mm sieve if the mean test value is equal to the LSL or USL and $s = 0$.

In cases where the Contractor is to cease paving operations based upon an Acceptance result or payfactor, the Contractor will submit a corrective action plan to the Department. The Department will only allow the continuation of paving operations when it is satisfied the corrective action will result in an improvement in results. The Department may require the submittal of a passing verification sample to allow further production.

401.203 Lot Size The Lot size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 tons, with unanticipated over-runs of up to 1500 ton rolled into the last lot. Sublot sizes shall be 750 ton for mixture properties, 500 ton for base or binder densities and 250 ton for surface densities. The minimum number of sublots for mixture properties shall be four, and the minimum number of sublots for density shall be five.

TABLE 4: ACCEPTANCE LIMITS

Property	USL and LSL
Passing 4.75 mm and larger sieves	Target +/-7%
Passing 2.36 mm to 1.18 mm sieves	Target +/-5%
Passing 0.60 mm	Target +/-4%
Passing 0.30 mm to 0.075 mm sieve	Target +/-2%
PGAB Content	Target +/-0.4%
Air Voids	4.5% +/-2.0%
Fines to Effective Binder	0.9 +/-0.3
Voids in the Mineral Aggregate	18.0 minimum
Voids Filled with Binder	<u>401.03 Composition of Mixtures</u> Table 1 values plus a 8% production tolerance for USL only
% TMD (In place density)	94.5% +/- 2.5%

TABLE 4A: MINIMUM HWT ACCEPTANCE FREQUENCIES

Test or Action	Frequency	Test Method
<u>Hamburg Wheel Tracker</u>	<u>1 per project (minimum)</u>	<u>AASHTO T 324</u>

The Department will determine a pay factor (PF) using Table 4: Acceptance Limits. The Department will not make price adjustments for VMA, Air Voids, VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Test Strip A minimum test strip of 60 ton placed at a nominal depth of 1 ¾ inch, full lane width, shall be required. Two samples shall be taken from the test strip tonnage, and it shall be evaluated under the 2021 Division 400, Section 401- Hot Mix Asphalt Pavement, Method B testing requirements for mix volumetrics and density. The test strip may be constructed outside the project limits, at a location agreed upon by the Contractor and Department. If the test strip is to be constructed within the project limits, it shall be constructed outside the I-295 travelway and in a location approved of by the Department. Prior to placement of the test strip, a leveling course (Item 403.211) shall be placed at the chosen location unless the area is prepared by milling of the existing pavement. A tack coat of Item 409.15, Bituminous Tack Coat, shall be applied to the level course or milled surface prior to the placement of the HMA surface course, payment to be made under the 409.15 pay item. The test strip will be excluded from the remainder of the projects' QA analysis. The Contractor shall notify the Department at least 48 hours in advance of placing the test strip. The test strip is intended to allow the Contractor to establish a method of compaction and adjust plant settings prior to mainline plant production.

403.05 Basis of Payment The accepted quantities of HMA-ARGG will be paid for at the contract unit price per ton for the mixture in place.

Payments will be made under the appropriate mixture type used:

Pay Item

403.301 12.5 mm HMA-ARGG

Pay Unit

Ton