



Janet T. Mills
GOVERNOR

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

Bruce A. Van Note
COMMISSIONER

July 3, 2019
Subject: Large Culvert Replacement
State WIN: 022930.00
Location: **Monson**
Amendment No. 2

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

REMOVE pages 17 – 20, Proposal Schedule of Items, 4 pages, dated 6/10/2019, and **REPLACE** with the attached, revised Proposal Schedule of Items, 4 pages, dated 7/3/2019.

REMOVE pages 79 - 80, SPECIAL PROVISION – SECTION 403 – HOT MIX ASPHALT, 2 pages, dated June 17, 2019, and **REPLACE** with the attached, revised SPECIAL PROVISION – SECTION 403 – HOT MIX ASPHALT, 2 pages, dated July 1, 2019.

ADD the attached SPECIAL PROVISION – SECTION 462 – GAP-GRADED HMA – (Ultra-Thin Bonded Wearing Course), 7 pages, dated January 30, 2019.

In the Plan Set:

On SHEET NUMBER 2 OF 19 – GENERAL NOTES, CONSTRUCTION NOTES AND TYPICAL SECTION, **CHANGE** “4.5” HMA” to read “**4.75” HMA**”. Make this change in pen and ink.

On SHEET NUMBER 6 OF 19 – PLAN/PROFILE, **CHANGE** “4.5” HMA” to read “**4.75” HMA**”. Make this change in pen and ink.

On SHEET NUMBER 6 OF 19 – PLAN/PROFILE, **CHANGE** “1.5” WEARING COURSE” to read “**0.75” WEARING COURSE**”. Make this change in pen and ink.

On SHEET NUMBER 7 OF 19 – PLAN/PROFILE, **CHANGE** “1.5” WEARING COURSE” to read “**0.75” WEARING COURSE**”. Make this change in pen and ink.

On SHEET NUMBER 9 OF 19 – CROSS SECTIONS, **CHANGE** “1.5” WEARING COURSE” to read “**0.75” WEARING COURSE**”. Make this change in pen and ink.

On SHEET NUMBER 14 OF 19 – CROSS SECTIONS, **CHANGE** “1.5” WEARING COURSE” to read
“**0.75” WEARING COURSE**”. Make this change in pen and ink.

Consider these changes and information prior to submitting your bid on **July 10, 2019**.

Sincerely,



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

7/3/2019

Maine Department of Transportation

Proposal Schedule of Items

Page 1 of 4

Proposal ID: 022930.00

Project(s): 022930.00

SECTION: 1 Large Culvert Work

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	202.203 PAVEMENT BUTT JOINTS	170.000 SY	_____	_____	_____	_____
0020	203.20 COMMON EXCAVATION	960.000 CY	_____	_____	_____	_____
0030	203.25 GRANULAR BORROW	250.000 CY	_____	_____	_____	_____
0040	206.07 STRUCTURAL ROCK EXCAVATION - DRAINAGE AND MINOR STRUCTURES	20.000 CY	_____	_____	_____	_____
0050	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	840.000 CY	_____	_____	_____	_____
0060	403.213 HOT MIX ASPHALT 12.5 MM BASE	445.000 T	_____	_____	_____	_____
0070	409.15 BITUMINOUS TACK COAT - APPLIED	120.000 G	_____	_____	_____	_____
0080	462.30 ULTRATHIN BONDED WEARING COURSE	2,360.000 SY	_____	_____	_____	_____
0090	508.13 SHEET WATERPROOFING MEMBRANE	LUMP SUM	LUMP SUM		_____	_____
0100	511.07 COFFERDAM: DOWNSTREAM	LUMP SUM	LUMP SUM		_____	_____
0110	511.07 COFFERDAM: UPSTREAM	LUMP SUM	LUMP SUM		_____	_____
0120	534.7101 PRECAST CONCRETE BOX CULVERT - STATE SUPPLIED	LUMP SUM	LUMP SUM		_____	_____

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Proposal Schedule of Items

Page 2 of 4

Proposal ID: 022930.00

Project(s): 022930.00

SECTION: 1 Large Culvert Work

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0130	606.1301 31" W-BM GR, MID-WAY SPLICE-SGL FACED	662.500 LF	_____	_____	_____	_____
0140	606.1305 31" W-BM GR, MID-WAY SPLICE FLARED TERMINAL	3.000 EA	_____	_____	_____	_____
0150	606.1306 31" W-BM GR, MID-WAY SPLICE TANGENT TERMINAL	1.000 EA	_____	_____	_____	_____
0160	606.353 REFLECTORIZED FLEXIBLE GUARDRAIL MARKER	8.000 EA	_____	_____	_____	_____
0170	606.754 WIDEN SHOULDER FOR GUARDRAIL 350 FLARED TERMINAL	1.000 EA	_____	_____	_____	_____
0180	610.08 PLAIN RIPRAP	40.000 CY	_____	_____	_____	_____
0190	613.319 EROSION CONTROL BLANKET	100.000 SY	_____	_____	_____	_____
0200	615.10 DIRTY BORROW	100.000 CY	_____	_____	_____	_____
0210	618.14 SEEDING METHOD NUMBER 2	16.000 UN	_____	_____	_____	_____
0220	619.12 MULCH	18.000 UN	_____	_____	_____	_____
0230	619.14 EROSION CONTROL MIX	75.000 CY	_____	_____	_____	_____
0240	620.54 STABILIZATION/REINFORCEMENT GEOTEXTILE	230.000 SY	_____	_____	_____	_____

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Proposal Schedule of Items

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Proposal ID: 022930.00

Project(s): 022930.00

SECTION: 1 Large Culvert Work

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0250	627.733 4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	1,800.000 LF	_____	 _____	_____	 _____
0260	629.05 HAND LABOR, STRAIGHT TIME	20.000 HR	_____	 _____	_____	 _____
0270	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	10.000 HR	_____	 _____	_____	 _____
0280	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	20.000 HR	_____	 _____	_____	 _____
0290	639.19 FIELD OFFICE TYPE B	1.000 EA	_____	 _____	_____	 _____
0300	643.72 TEMPORARY TRAFFIC SIGNAL @ Rte.6	LUMP SUM	LUMP SUM		_____	 _____
0310	652.33 DRUM	35.000 EA	_____	 _____	_____	 _____
0320	652.34 CONE	75.000 EA	_____	 _____	_____	 _____
0330	652.35 CONSTRUCTION SIGNS	180.000 SF	_____	 _____	_____	 _____
0340	652.36 MAINTENANCE OF TRAFFIC CONTROL DEVICES	36.000 CD	_____	 _____	_____	 _____
0350	652.38 FLAGGER	250.000 HR	_____	 _____	_____	 _____
0360	652.61 STAGED CONSTRUCTION AND TRAFFIC CONTROL	LUMP SUM	LUMP SUM		_____	 _____

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Maine Department of Transportation

Proposal Schedule of Items

Page 4 of 4

Proposal ID: 022930.00

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Alt Set ID: Alt Mbr ID:

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0370	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP SUM	LUMP	SUM	_____	_____
0380	659.10 MOBILIZATION	LUMP SUM	LUMP	SUM	_____	_____
Section: 1			Total:		_____	_____
			Total Bid:		_____	_____

SPECIAL PROVISION
SECTION 403
HOT MIX ASPHALT

Desc. Of Course	Grad Design	Item Number	Total Thick	No. Of Layers	Comp. Notes
<u>4" HMA Overlay Area – Full Construction Areas</u>					
<u>Mainline Travelway & Shoulders (As Indicated by Typical)</u>					
Base	12.5 mm	403.213	1 ½"	1	1,4,10,22,24
Base	12.5 mm	403.213	2 ½"	1	1,4,10,22,24
<u>Ultra-Thin Bonded Wearing Course</u>					
<u>Mainline Travelway & Shoulders (As Indicated in Typical)</u>					
Wearing	Type C	462.30	¾"	1	1,10,27

COMPLEMENTARY NOTES

1. The required PGAB for this mixture will meet a **PG 64-28** grading.
4. The design traffic level for mix placed shall be 0.3 to <3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **65 gyrations**.
10. Section 106.6 Acceptance, (2) Method D. The Contractor shall submit a QCP to the Department no less than 21 days prior to beginning paving operations and shall not begin paving operations until the Department approves the QCP in writing. The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement including, but not limited to, the following:
 - a. All Method D Requirements as specified in Section 401 of the Standard Specifications.
 - b. Sections a, d – k, n, o-q, and u – v of the QCP Requirements as specified in Section 401.18 of the Standard Specification.
 - c. Anticipated Compaction Temperature Zones during placement.
22. The Contractor shall supply a QCP Administrator, Process Control Technician (PCT), and a Quality Control Technician (QCT) with the requirements as specified in Section 401.18 of the Standard Specifications. Prior to placing any mix, the Department and the Contractor shall hold a Pre-paving Conference to discuss the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, project lots and traffic control. All personnel of the Department and the Contractor who have significant information relevant to the paving items shall attend, including the responsible onsite paving supervisor for the Contractor. The Resident will prepare minutes of the conference and distribute them to all attendees. Any requests to revise the minutes must be made to the Resident within 7 Days of Receipt. These minutes will constitute the final record of the Pre-paving conference.
24. Summaries of each day's results, including a daily paving report, summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and number of roller passes, shall be recorded and signed by the QCT and presented to the Department's representative by the end of the working day.
27. See Special Provision 462 – Ultra Thin Bonded Wearing Course for project specifics.

Tack Coat

A tack coat of emulsified asphalt, RS-1, RS-1h, CRS-1 or CRS-1h, Item 409.15 shall be applied to any existing pavement at a rate of approximately 0.030 gal/yd², and on milled pavement approximately 0.05 gal/yd² prior to placing a new course. A fog coat of emulsified asphalt shall be applied between shim /base courses and surface course as well as to any bridge membrane prior to the placement of HMA layers at a rate not to exceed 0.030 gal/yd². Tack used will be paid for at the contract unit price for Item 409.15 Bituminous Tack Coat.

SPECIAL PROVISION
SECTION 462
GAP-GRADED HMA
(Ultra-Thin Bonded Wearing Course)

The following subsections of the most current version of Specification 401 – Hot Mix Asphalt Pavements have been revised and modified by the following:

Description This work shall be constructed in accordance with the applicable referenced sections of Division 400 – Pavements; Section 401 – Hot Mix Asphalt Pavement, and the requirements of Section 106 – Quality. All sections not revised by this Special Provision shall be as outlined in the Special Provision 400 Pavements, Section 401 – Hot Mix Asphalt Pavement. References to Standard Specifications, Special Provisions, or other documents, shall be determined as the most current version available at the time of bid, or as amended. The Ultra-Thin Bonded Wearing Course consists of a warm polymer modified asphalt emulsion tack coat followed immediately with an Ultra-Thin hot mix asphalt wearing course. The tack coat is spray applied immediately prior to the application of the wearing course to produce a durable wearing surface that can be opened to traffic. The finished surface treatment has a nominal thickness of $\frac{1}{2}$ ", for Type A, $\frac{5}{8}$ " for Type B, and $\frac{3}{4}$ " for Type C.

MATERIALS

The Contractor shall formulate and submit to the Department, a job mix formula (JMF) that satisfies the design general limits listed in Table 1 – Mixture requirements. The JMF aims shall not fall outside the general design limits.

TABLE 1: COMPOSITE GRADATION

AASHTO Standard Sieve Size	Total % Passing by Weight		
	Type A - $\frac{1}{4}$ "	Type B - $\frac{3}{8}$ "	Type C - $\frac{1}{2}$ "
19 mm ($\frac{3}{4}$ "	-	-	100
12.5 mm ($\frac{1}{2}$ "	-	100	85-100
9.5 mm ($\frac{3}{8}$ "	97-100	85-100	45-85
4.75 mm (#4)	40-60	24-41	24-41
2.36 mm (#8)	21-33	21-33	21-33
1.18 mm (#16)	15-26	15-26	15-26
0.60 mm (#30)	11-20	11-20	11-20
0.30 mm (#50)	8-16	8-16	7-16
0.15 mm (#100)	5-10	5-10	5-10
0.075 mm (#200)	4.0-7.0	4.0-7.0	4.0-7.0
Minimum % PGAB	5.1	5.0	5.0

*All aggregate percentages are based on the total weight of the aggregate. The composite gradation for each individual type of mixture shall meet the gradation requirements of Table 1.

The estimated PG binder film thickness shall be calculated for the submitted mix design. Designs with estimated film thickness less than 10 microns may be approved pending successful placement in the field. The estimated film thickness of asphalt shall be calculated using the effective asphalt content in conjunction with the surface area for the aggregates in the JMF according to the following formula and the factors in Table 2:

$$FT = \frac{AC \cdot 1000}{SA \cdot SG}$$

where: *FT* = film thickness (microns)
AC = asphalt content of mix design (%)
SA = total surface area of aggregate (SM/Kg)*
SG = specific gravity of asphalt

* Surface area is calculated by multiplying the percent passing for the design by the factors in the table below for each sieve size and summing the resultant values.

TABLE 2: SURFACE AREA FACTORS

AASHTO Standard Sieve Size	Surface Area Factors (SM/Kg)		
	Type A - ¼"	Type B - ⅜"	Type C - ½"
19 mm (¾")	-	-	0.41
12.5 mm (½")	-	0.41	0
9.5 mm (⅜")	0.41	0	0
4.75 mm (#4)	0.41	0.41	0.41
2.36 mm (#8)	0.82	0.82	0.82
1.18 mm (#16)	1.64	1.64	1.64
0.60 mm (#30)	2.87	2.87	2.87
0.30 mm (#50)	6.14	6.14	6.14
0.15 mm (#100)	12.29	12.29	12.29
0.075 mm (#200)	32.77	32.77	32.77

Aggregates used shall be from an approved source and shall meet the requirements of section 703.07 for 3.0 to < 10 million ESALs, and as modified by items 1 through 7 listed below.

1. Individual coarse aggregates sources shall meet a Micro-Deval (AASHTO T 327) value of 18 or less.
2. Individual coarse aggregates sources shall have a maximum LA Abrasion (AASHTO T96) of 30.
3. Absorption by AASHTO T 84 shall be less than 2.0% for fine aggregate blends.
4. Absorption by AASHTO T 85 shall be less than 2.0% for coarse aggregate blends.
5. Aggregates shall have a minimum sand equivalent of 45, (AASHTO T 176), and the fine aggregate shall be 100% crushed.
6. 95 % of the aggregate shall have at least a single face crushed and 85% shall have 2 or more crushed.
7. Percent by weight of Flat and Elongated particles shall be (5:1 ratio) with 10% maximum.
8. Coarse aggregates, when measured in any dimension, shall not contain particles larger than the lift being placed or ¾ inch, whichever is less.

The Contractor shall test all materials and provide copies of all test results to the Department for materials utilized in the completion of the work. The Contractors' test results shall be submitted to the Department along with the mix design submittal in accordance with the MaineDOT HMA Policy and Procedures Manual.

Performance Graded Asphalt Binder Unless otherwise shown in the contract bid items or noted in Special Provision 403 - Hot Bituminous Pavement, all asphalt binders shall meet a 64-28 PGAB grade. The Contractor may use an approved chemical or wax based warm mix additive when producing UTBWC mixtures using modified PGAB such as 64E-28.

Emulsified Tack Coat Tack Coat shall be modified with latex, natural or synthetic, and shall be certified as meeting the requirements of ASTM D2397 except as modified in Table 3 – Tack Coat Material Properties. It is required that the latex be co-milled at the bulk emulsion facility, to ensure complete and balanced blending. CRS-1P asphalt grade emulsions shall have a minimum asphalt content ratio of 63%.

TABLE 3: TACK COAT MATERIAL PROPERTIES

Property	Method	Minimum	Maximum
Latex Content, % Mass of Total Residue		3.0	
Viscosity at 25°C, (Sec.)	ASTM D244	20	100
Setting Time, Minutes	Observation	3	7
Demulsibility, % by wt. Residue	ASTM D244	40	
Penetration, 25°C (77°F)	T 49	60	150

Deliveries of the emulsified tack coat shall be accompanied by a loading invoice, delivery ticket, or slip, as required under Section 108.1.3 f in addition to the Certificate of Analysis. The emulsified tack coat loading invoice/delivery ticket and Certificate of Analysis shall be provided to the Resident. In the event an intermediate hauler of the asphalt material is involved, a copy of their own delivery slip shall be furnished, as well as a copy of the supplier's loading invoice. The hauler's delivery slip and the supplier's loading invoice shall be cross-referenced by use of their respective serial numbers.

EQUIPMENT

Spray Pavers The spray paver shall be configured to spray tack at the specified rate, and apply hot mix asphalt seconds later. The spray bar shall be located just ahead of the paver's auger, and distribute the liquid through computer-controlled, self-cleaning valves. An onboard microprocessor shall be capable of precisely controlling the rate of flow interlocked to the paver speed. Spray valves shall also be controlled manually if needed. The paver shall have a receiving hopper with sufficient capacity for a uniform spreading operation and a mixture distribution system to place the mixture uniformly, without segregation. The screed assembly shall produce a finished surface of the uniform texture without tearing, shoving, or gouging the mixture.

The self-priming spray paver must be capable of spraying the tack coat, applying the hot asphalt overlay and smoothing the surface of the mat being paved in one pass, at the rate of 33-98 feet per minute. The self-priming spray paver must incorporate a receiving hopper, feed conveyor, heated or insulated storage tank for emulsion, metered tack coat spray bar and a variable width, heated, ironing type screed. The self-priming spray paver shall be a track or rubber tire mounted highway class paver with a minimum combined tractor and screed weight of 44,000 pounds, and a minimum main screed

width of 8 feet. All paver screeds shall be outfitted with auger and tunnel extensions as required to distribute the mix within two feet of the end gate. All pavers shall have power extendible, activated, and heated screed extensions designed by the manufacturer for highway paving. Screeds shall be configured to place mixtures to the required width, crown, and breakpoints as directed by the Department. The paver must have a material receiving hopper size capable of accepting haul trucks, and be of sufficient size and weight to maintain the required rate of placement, line of travel, depth, and cross section while engaged with a loaded tri-axle or trailer haul unit. The screed must be sized to place the mixture over the entire lane width being paved in one pass. It shall also have the ability to be positively crowned at the center of lane and have adjustable extensions to accommodate the desired pavement width and cross sectional profile. The Contractor shall operate the paver in such a manner as to produce a visually uniform surface texture. Any UTBWC that becomes visually unacceptable due to mixture cooling, checking, segregation or deformation as a result of an interruption in mix delivery, or excessive delays in re-charging the emulsion tanks shall be removed and replaced with material that meets contract specifications at no cost to the Department.

Rollers The Contractor shall use 7 foot wide double drum steel wheeled rollers weighing at least 8 to 10 ton, that are equipped with functioning water systems and scrapers to prevent the fresh mix from adhering to the roller drums. If the rollers narrower than 7 foot are to be used, the Contractor will be required to use additional rollers or slow placement speed of the paver to ensure full mat coverage is made immediately behind the spray paver.

CONSTRUCTION DETAILS

Weather and Seasonal Limitations All work shall be in accordance with Section 401 – Hot Mix Asphalt Pavement , subsection 401.06 - Weather and Seasonal Limitations.

Surface Preparation The Contractor shall remove painted striping, mill the existing pavement surface as described in the contract documents, crack seal as required by the contract documents, and sweep the roadway as needed prior to the surface treatment. Stripe removal, milling and crack seal will be paid for under the appropriate contract items.

Crack sealing, if required in the contract, will be paid under the appropriate crack seal item. The Contractor shall crack seal transverse and longitudinal cracks as considered appropriate. Unless otherwise directed cracks shall be flush filled with minimal over-banding, and the material type and shall conform to ASTM D-6690, Type II or AASHTO M 324, and paid under the appropriate Type II crack seal item.

Spot shims or leveling course, if required by the Department, shall be paid for under the appropriate 403.211 - 9.5mm shim unit price included in the contract. Sweeping will not be paid for directly, but shall be included in the 462.30 or 462.301 - Ultra-Thin Bonded Wearing Course contract price.

Application The screed on the paver shall be heated to a temperature between 275°F-335°F before placing Ultra-Thin Bonded Wearing Course on the roadway. Apply the tack coat meeting the requirements of Table 3 at a temperature of 120° - 180° F. The application of tack coat shall be uniform across the entire width to be overlaid, at a rate of 0.20 - 0.25 gallons per square yard, depending upon the existing surface texture. Field adjustments to the target application rate of tack coat shall be determined based upon the existing surface condition of the pavement. The tack coat application rate may be adjusted to 0.17-0.25 gallons per square yard if used over newly placed HMA

levelling course. Adjustments to the tack coat target application rate shall be approved by the Department. All changes to the emulsified tack coat application shall be located with station references, recorded, and included in the daily QC report.

The Contractor shall make all efforts to minimize walking on the unrolled mat. Displacement, marring, or depressions that result from walking on or across the mat will require immediate repair before rolling. Repeated incidences of irreparable surface defects may result in work stoppage until the issue is resolved.

A tack coat of CRS-1P shall be applied to the vertical transverse joint surface and the underlying roadway at each transverse joint takeoff. Should the spray paver be unable to apply tack coat to the vertical transverse joint when paving a tack coat of CRS-1P or RS-1 shall be applied to the vertical joint and adjacent surfaces for at least the first 10 feet. The application rate shall be a minimum of 0.05 gal/s.y. for the tack application at transverse joints. The Contractor shall continuously monitor the rate of spray. No equipment shall come in contact with the tack coat before the hot mix asphalt wearing course is applied. Immediately after applying the tack coat, the contractor shall apply the hot mix asphalt overlay across the full width of the tack coat at a temperature of 290° - 335° F.

Compaction The Contractor shall begin compaction immediately behind the spray paver after the application of wearing course. The roller(s) shall make a minimum of two passes. The roller(s) will not be allowed to stop on the freshly placed wearing course. The Contractor shall use an adequate number of rollers to complete compaction and aggregate seating before the pavement surface temperature falls below 185° F for 64-28 PGABs, or below 210° F for PG 64E-28. The Contractor shall provide an additional roller if the Contractor elects to pave travelway and adjacent shoulder concurrently and the adjacent shoulder exceeds four feet in width. The Contractor shall protect the wearing course from traffic until the rolling operation is complete and the material has cooled sufficiently to resist damage.

UTBWC Documentation The Contractor and the Department shall agree on the amount of UTBWC, measured in square yards, that has been placed each day. The Contractor and the Department shall agree on the amount of emulsified tack coat (in gallons) and HMA (in tons) that have been placed each day. All delivery slips shall conform to the requirements of 401.073.

Quality Control All work shall be in accordance with Division 400 – Pavements; Section 401 – Hot Mix Asphalt Pavement , subsection 401.18- Quality Control Method A, B & C, with the exception of the following revisions;

The Contractor shall sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with the following minimum frequencies per each approved mix design:

TABLE 4: 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	-
Emulsified tack coat application rate & yield*	1 per 10,000 SY (minimum of 2 per day)	-
Gradation	1 per 500 ton	AASHTO T30
PGAB content	1 per 500 ton	AASHTO T164 or T308
Rice Specific Gravity	1 per 500 ton	AASHTO T209
Coarse Aggregate Angularity	1 per 5000 ton	ASTM D5821
Flat and Elongated Particles	1 Per 5000 ton	ASTM D4791
Fine Aggregate Angularity	1 Per 5000 ton	AASHTO T304

* Emulsified tack coat application rate and yield shall be verified independent of the rate displayed on the paver

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 5 below.

TABLE 5: CONTROL LIMITS

Property	UCL and LCL
Passing NMA sieve	Target +/-4.0 [∇]
Passing 4.75 mm and larger sieves	Target +/-4.0
Passing 2.36 mm sieve	Target +/-2.5
Passing 0.075 mm sieve	Target +/-1.0 [^]
PGAB Content*	Target +/-0.25
Theoretical Maximum Specific Gravity	JMF Target +/-0.020

[∇] The mixture shall be produced to comply with the control points outlined in Table 1.

* Based on AASHTO T 308

[^] The minimum LCL shall be 3.0% and the maximum UCL shall be 7.0%.

Acceptance Acceptance shall be in accordance with this Special Provision. 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 4,500 tons (120,000 square yards). Remaining tonnage (square yards) may be rolled into the last lot allowed up to a maximum size of 6,000 tons (160,000 square yards). Sublot sizes shall be 750 tons (20,000 square yards) for mixture properties, with unanticipated over-runs of up to one-half of the sublot rolled into the last sublot. The minimum number of sublots per Lot for mixture properties shall be five.

TABLE 6: UTBWC ACCEPTANCE CRITERIA

Property	Point of Sampling	Test Method
Gradation	Paver Hopper	AASHTO T30
PGAB Content	Paver Hopper	AASHTO T308

TABLE 7: UTBWC ACCEPTANCE LIMITS

Property	USL and LSL
Passing NMAS sieve	Target +/-5%*
Passing 4.75 mm and larger sieves	Target +/-5%
Passing 2.36 mm to 1.18 mm sieves	Target +/-3%
Passing 0.60 mm	Target +/-3%
Passing 0.30 mm to 0.15 mm sieve	Target +/-2%
Passing 0.075 mm sieve	Target +/-2%^
PGAB Content	Target +/-0.3%

* The mixture shall be produced to comply with the control points outlined in Table 1.

^ The minimum LSL shall be 3.0% and the maximum USL shall be 7.0%.

Pay Adjustment The Department will sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with Section 106 - Quality and Section 401.20 - Acceptance, of Division 400 – Pavements, and this Special Provision.

The Department will use Performance Graded Asphalt Binder content, and the screen sizes listed in this specification for the type of mixture represented in the JMF. If any pay factor for any single property falls below 0.85, the Contractor shall cease production at the HMA plant. If the percent passing the nominal maximum sieve, the 2.36 mm sieve, the 0.300 mm sieve or the 0.075 mm sieve falls below 0.80, then the composite pay factor for the four sieves shall be 0.55.

PGAB Content and Gradation The Department will determine a pay factor for each square yard using Table 7: Acceptance Limits. The Department will calculate the price adjustment for Mixture Properties as follows:

$$PA = 0.70[(\% \text{ Passing Nom. Max PF}-1.0)(Q)(P)X0.05+(\% \text{ passing 2.36 mm PF}-1.0)(Q)(P)X0.05+(\% \text{ passing 0.30 mm PF}-1.0)(Q)(P)X0.05+(\% \text{ passing 0.075 mm PF}-1.0)(Q)(P)X0.10+(PGAB \text{ PF}-1.0)(Q)(P)X0.25]$$

Dispute Resolution All work shall be in accordance with Division 400 – Pavements; Section 401 – Hot Mix Asphalt Pavement, subsection 401.223 Process for Dispute Resolution.

Method of Measurement The Ultra-Thin Bonded Wearing Course shall be measured by the square yard.

Basis of Payment The accepted quantity of Ultra-Thin Bonded Wearing Course will be paid for at the contract unit price per square yard, complete in-place which price will be full compensation for furnishing all equipment, material, labor, and all incidentals necessary to complete the work. Pay adjustments may be made as outlined in this specification.

Payments will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
462.30 Ultra-Thin Bonded Wearing Course	Square Yard
462.301 Polymer-Modified Ultra-Thin Bonded Wearing Course	Square Yard