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GOVERNOR

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

Bruce A. Van Note  
COMMISSIONER

February 20, 2020  
Subject: Pavement Milling,  
HMA Overlay, with Drainage &  
Safety Improvements  
State WINS: 023685.00 & 024467.00  
Location: **Jackman, Moose River,  
Dennistown Plantation &  
Sandy Bay Township  
Amendment No. 1**

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

**REMOVE** page 131, SPECIAL PROVISION - SECTION 401 – HOT MIX ASPHALT PAVEMENT - (HMA with Fine Micro-Deval Requirement), 1 page, dated January 19, 2017, and **REPLACE** with the attached, revised SPECIAL PROVISION - SECTION 401 - HOT MIX ASPHALT PAVEMENT - (HMA with Fine Micro-Deval Requirement), 1 page, dated January 25, 2020.

**REMOVE** pages 145 - 151, SPECIAL PROVISION - SECTION 462 -\_GAP-GRADED HMA - (Ultra-Thin Bonded Wearing Course), 7 pages, dated January 7, 2020, and **REPLACE** with the attached, revised SPECIAL PROVISION - SECTION 462 -\_GAP-GRADED HMA - (Ultra-Thin Bonded Wearing Course) 7 pages, dated January 27, 2020.

The following questions have been received:

**Question:** Will the DOT allow the use of Sanitite HP Triplewall HP for the 48" slipline pipe?

**Response:** Yes, the Department will allow the use of Sanitite HP Triplewall HP for the 48 inch slipline pipe.

**Question:** Will the DOT allow the use of Sanitite HP Triplewall as an alternate to the 60" RCP class III pipe on the project?

**Response:** No. Polypropylene pipe is allowed on HCP 2s, however not with less than 3.5 feet cover or greater than 15 feet deep. In this case we have only 3 feet of cover, so an RCP is required.

**Question:** Do you want 7' or 8' guardrail posts?

**Response:** 2,375 feet of guardrail is 8 foot posts, and 5,125 feet of guard rail is 7 foot posts. Specific locations will be provided at the preconstruction meeting.

**Question:** Notes for 403.21041 Thin Lift Surface Treatment Station 51+25- 775+15 (LT) only? Should it be LT & RT?

**Response:** Yes, it should be LT & RT.

**Question:** Shim item 403.211 For the UTBW section, does the Department have a quantity expected? If used will a full roller train be required?

**Response:** The quantity of shim required on the UTBWC section will be dependent upon the amount of rut that remains or delamination that occurs after milling the existing pavement surface. The full roller train with two steel rollers and pneumatic roller would be required for longer areas with rutting or delamination, while shorter areas may only require a single steel and pneumatic. Each situation would dictate the type and number of rollers to be utilized.

**Question:** Item 307.331 Would the department accept the use of a mill instead of a reclaimer?

**Response:** The use of a milling machine would be acceptable to the Department with the condition that the full depth layer is pulverized, and materials are processed to the required particle size and left in-place.

**Question:** Detail "A" on pages 38-39 shows paving to within 3" of post. Would it be acceptable to pave within 1" of face or rail or should we cost removing rail and reinstall to pave within 3" of post?

**Response:** The Departments intent is to replace all the existing guardrail. It was anticipated that a wedge device or similar apparatus could or would be used to place HMA mixes under the rail face and would be adjusted in a manner as to not require additional compaction under the rail if the new rail is installed prior to paving. This approach was commonplace prior to allowing placement of surface mixes only to the face of rail.

**Question:** Will the in-water work dates of July 15th- September 30th be enforced on the 8 cross pipes located by wetlands and streams as listed on page 85 of bid book?

**Response:** No, the SP 105 states that in-water work is allowed anytime.

**Question:** Is the intention for the Cold In Place to match the proposed slope sheets or will the shimming operation be utilized?

**Response:** It is the Department's understanding that the CIPR process can correct some cross-slope deficiency and has reviewed the slope data and has designed proposed slopes to be within 1.5% of existing conditions. It is intended to correct cross slope to the best ability possible with the CIPR operation, and any remaining areas of concern would be identified and corrected by shimming. The existing centerline grade can be adjusted +/- 1.5 inches to accommodate slope corrections utilizing CIPR.

**Question:** Would it be acceptable to do the Cold In Place operation before the cross pipes are done and patch with HMA in order to try to meet all seasonal deadlines?

**Response:** The intent of the Contract is to install all cross pipes prior to beginning the CIPR operation.

**Question:** Would the Department be willing to remove the culvert locations from the ride ability calculations on the project?

**Response:** The Department will not exclude pipe replacement areas from the ride quality assessment. Once the ride quality data has been collected, and areas of any poor ride quality are identified, the Department would evaluate the severity and possible causes of poor ride quality. Should a project evaluation identify areas that impact ride quality, and those areas are the result of activities or events beyond the contractor's control, the Department would remove those localized areas from the pay factor calculation for ride quality incentive / disincentive.

**Question:** Would the Department complete a ride ability for the project without all the surface completed in one season?

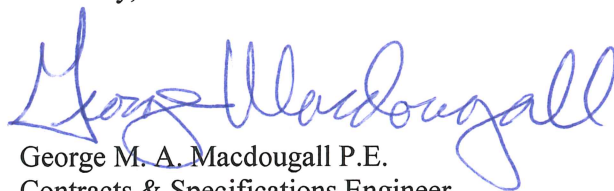
**Response:** The Contract is to be completed within one construction season. Should the Contractor be unable to complete the work in one season, the Department would consider collecting in separate segments broken out by the year collected. This would depend on the size of the segments completed by the end of the season. Regardless of the year collected, the data will be evaluated as one singular lot.

**Question:** Could the limits for the dirty borrow be shared? How far from the edge of pavement will this material be placed? Could locations be provided as well?

**Response:** Dirty borrow to be used in areas where there is not enough existing material to back up shoulders. Dirty borrow is not anticipated to extend more than 8 ft from edge of pavement.

Consider these changes and information prior to submitting your bid on **February 26, 2020**.

Sincerely,



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

**SPECIAL PROVISION**  
**SECTION 401 - HOT MIX ASPHALT PAVEMENT**  
(HMA with Fine Micro-Deval Requirement)

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

401.01 Description The Contractor shall compose Hot Mix Asphalt (HMA) Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. If denoted in Special Provision 403 - Hot Mix Asphalt Pavement, the mixtures shall meet the additional aggregate requirements of this special provision.

401.02 Materials Materials shall meet the requirements specified in Section 700 – Materials, unless otherwise revised in this special provision:

Aggregates for HMA Pavement	703.07
HMA Mixture Composition	703.09

The HMA blend, minus any RAP used, shall have a Fine Micro-Deval value of 15.0 or less as determined by weighted average of individual fine aggregate source values determined through ASTM D7428.

**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 ½”, for Type A, 5/8” for Type B, and ¾” 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 - ¼”	Type B - 3/8”	Type C - ½”
19 mm (¾”)	-	-	100
12.5 mm (½”)	-	100	85-100
9.5 mm (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 - 1/4"	Type B - 3/8"	Type C - 1/2"
19 mm (3/4")	-	-	0.41
12.5 mm (1/2")	-	0.41	0
9.5 mm (3/8")	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 3/4 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 0.22 - 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 0.17-0.22 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 401.19- 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 T 30
PGAB content	1 per 500 ton	AASHTO T 164 or T 308
Rice Specific Gravity	1 per 500 ton	AASHTO T 209
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 T 304

\* 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 NMAS sieve	Target +/-4.0 <sup>∨</sup>
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 <sup>^</sup>
PGAB Content*	Target +/-0.25
Theoretical Maximum Specific Gravity	JMF Target +/-0.020

<sup>∨</sup> The mixture shall be produced to comply with the control points outlined in Table 1.

\* Based on AASHTO T 308

<sup>^</sup> 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 T 30
PGAB Content	Paver Hopper	AASHTO T 308

TABLE 7: UTBWC ACCEPTANCE LIMITS

Property	USL and LSL
Passing NMAAS 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	LSL = Target - 0.3% USL = Target + 0.4%

\* 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:

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

Dispute Resolution All work shall be in accordance with Division 400 – Pavements; Section 401 – Hot Mix Asphalt Pavement , subsection 401.23 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