

**ITEM 03403.2210 M - PAVER PLACED SURFACE TREATMENT
ULTRATHIN HOT MIX ASPHALT WEARING CURSE, TYPE A**
**ITEM 03403.2220 M - PAVER PLACED SURFACE TREATMENT
ULTRATHIN HOT MIX ASPHALT WEARING CURSE, TYPE B**
**ITEM 03403.2230 M - PAVER PLACED SURFACE TREATMENT
ULTRATHIN HOT MIX ASPHALT WEARING CURSE, TYPE C**

DESCRIPTION. This specification cover the requirements for the placement of The Paver Placed Surface Treatment/Ultrathin Hot Mix Asphalt Concrete Wearing Course and shall consist of a warm polymer modified asphalt emulsion tack coat followed immediately with an ultrathin overlay of hot asphalt concrete. The tack coat shall be sprayed immediately prior to the application of the hot asphalt concrete overlay so as to produce a homogeneous wearing surface that can be opened to traffic immediately upon sufficient cooling. The finished wearing course shall have a minimum thickness of 12.5 mm for Type A and 16 mm for Type B and Type C.

MATERIALS.

The requirements of Section 401- Plant Mix Pavements - General for shall apply except as noted herein. The Marshall requirements of subsection 401-2.02 will not apply to this mix. The contractor shall formulate and submit to the Regional Director, a job mix formula that satisfies the design general limits listed in Table 1- Mixture Requirements. The production tolerances in Table 1 will be permitted to exceed the design general limits.

Table 1 - Mixture Requirements

Screen Size	Type A (6.3 mm)		Type B (9.5 mm)		Type C (12.5 mm)	
	Design ¹ General Limits % Passing	Production Tol. %	Design ¹ General Limits % Passing	Production Tol. %	Design ¹ General Limits % Passing	Production Tol. %
19.0 mm					100	--
12.5 mm			100	--	90-100	--
9.5 mm	100	--	75-100	±5	70-90	±5
6.3 mm	75-100	±5	30-45	±5	30-50	±5
4.75 mm	40-60	±4	24-37	±4	24-40	±4
2.36 mm	20-24	±4	21-26	±4	21-32	±4
1.18 mm	15-20	±3	15-23	±3	16-26	±3
600 µm	10-15	±3	12-15	±3	12-20	±3
300 µm	8-12	±3	8-14	±3	8-16	±3
150 µm	7-10	±2	5-10	±2	5-10	±2
75 µm	5-7	±2	4-7	±2	4-7	±2
% Asphalt	4.75-5.20	--	4.75 - 5.20	--	4.75 - 5.20	--
AC Grade No.	702-500	--	702-500	--	702-500	--

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NOTE 1: All aggregate percentages are based on total weight of the aggregate.

COARSE AGGREGATE. The single size, coarse aggregate shall be nominal 6.3 mm, 9.5 mm or 12.5 mm, meeting the following requirements.

TABLE 2 - Coarse Aggregate - Gradations

Screen Size	Total % Passing by Weight		
	Type A (6.3mm)	Type B (9.5mm)	Type C (12.5mm)
#19.0 mm		100	100
#12.5 mm		100	100
#9.5 mm	100	85 - 100	25 - 50
#6.3 mm	85 - 100	0 - 15	0 - 15
#4.75 mm	25 - 50	0 - 3	0 - 3
#2.36 mm	0 - 3	0	0
#1.18 mm	0	--	--

Coarse aggregates used shall be from approved sources and shall meet one of the following requirements:

1. Coarse aggregates shall be crushed limestone having an acid insoluble residue content of not less than 20%, excluding particles of chert and similar siliceous rocks.
2. Coarse aggregates shall be crushed dolomite having an acid insoluble residue content of not less than 17%, excluding particles of chert and similar siliceous rocks.
3. Coarse aggregates shall be crushed gravel or blends of two or more of the following types of materials; crushed gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, slag or other similar materials. These aggregates must meet the following requirements: For Paver Placed Surface Treatment/Ultrathin Hot Mix Asphalt Concrete Wearing Course mixes - not less than 20% (by weight with adjustments to equivalent volume for materials of different specific gravities) of the total coarse aggregate particles (plus 3.2 mm material) shall be non-carbonate. Non-carbonate particles are defined as those having an acid insoluble residue content not less than 80%.

Where coarse aggregates for these mixes are from more than one source or of more than one type of material, they shall be proportioned and blended to provide a uniform mixture.

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Table 3 - Coarse Aggregate - Properties

TEST	METHOD	VALUE
LA Abrasion Coefficient Max. % loss	ASTM C131	25
Water Absorption %	ASTM C127	2
Flakiness Index	NFP 18-561	20
Flakiness Coefficient (G/E)*		1.58
Crushing Ration, %		1.00
Cleanliness (% passing #600µm),%	ASTM D142	2
Resistance to stripping**%	ASTM D3625	95

*Where "G" is the smallest square opening through which the particle can pass and "E" is the smallest slot through which the particle can pass.

**Anti-Stripping agents may be required to provide resistance to stripping.

FINE AGGREGATE. The fine aggregate shall have a minimum sand equivalent of 60 (ASTM D2419). The fine aggregate shall be 100% crushed, and shall meet the following gradation:

Table 4 - Fine Aggregate Gradation

Screen Size	% Passing
#4.75 mm	100
#2.36 mm	90-100
#1.18 mm	60-80
#600 µm	45-60
#300 µm	30-40
#150 µm	20-30
#75 µm	15-25

MINERAL FILLER. Hydrated lime, fly ash, baghouse fines and cement are acceptable as mineral filler.

Typical acceptable gradation: 100% passing #600 µm
 75-100% passing #75 µm

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A. Tack Coat - The tack coat shall be a cationic asphalt emulsion, modified by the addition of an approved polymer, using either a natural or synthetic latex. The cationic asphalt emulsion shall be obtained from a storage facility that has been approved by the Director, Materials Bureau, New York State Department of Transportation within the current calendar year prior to the start of work. The modified emulsion shall meet the provisions of Item 702-4101, Grade CRS-2 with the following additions and exceptions.

Table 5 - Tack Coat Material Properties

Property	Method	Value	
		Min.	Max.
Polymer Content, % Mass of Total Distillation Residue		3.0	--
Viscosity, 25°C, (Sec.)	ASTM D244	20	100
Setting Time, Minutes		3	7
Demulsibility, 0.8% Sodium Dioctyl Sulfosuccinate 35 ml, % by wt of Residue	ASTM D244	40	--

CONSTRUCTION DETAILS.

A. Equipment - The Contractor shall use a self-priming paver, designed and built for the purpose of applying the Paver Placed Surface Treatment/Ultrathin Hot Mix Asphalt Concrete Wearing Course appearing on the current Materials Bureau Approved List. Requests for approval of equipment not currently on the Approved List shall be made to the Director, Materials Bureau, prior to the start of any work. All other equipment and tools shall be approved by the Engineer. All equipment and tools shall be maintained in satisfactory working condition at all times.

B. Application - The Paver Placed Surface Treatment/Ultrathin Hot Mix Asphalt Concrete Wearing Course shall not be placed on a wet pavement. The pavement surface temperature shall be not less than 10°C at the time of placement. A damp pavement surface is acceptable for placement if it is free of standing water and favorable weather conditions are to follow.

The tack coat shall be sprayed by a metered mechanical pressure spray bar at a temperature of 60-80°C. The sprayer shall accurately and continuously monitor the rate of spray and provide a uniform application across the entire width to be overlaid. The rate of spray shall be 0.68-1.13 l/m².

No wheel or other part of the paving machine shall come in contact with the tack/seal coat before the hot mix asphalt concrete wearing course is applied.

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The hot mix asphalt concrete shall be applied at a temperature of 150-165°C and shall be spread over the tack coat immediately after the application of the tack coat. The hot asphalt concrete wearing course shall be placed over the full width of the tack coat with a heated, ironing type screed.

Because of the minimal depth of the hot mix asphalt concrete being placed, it may be damaged if opened to traffic too quickly. Therefore, the new pavement shall not be opened to traffic until the rolling operation is complete and the material has cooled sufficiently to resist damage. The cooling time will be brief due to the minimal depth of the mat.

C. Surface Preparation - The following items will be performed prior to the commencement of paving operations and paid for under the appropriate item numbers

1. Manhole covers, water boxes, catch basins and other such utility structures shall be protected and covered with plastic or building felt prior to paving and also shall be clearly referenced for location and adjustment after paving.
2. Thermoplastic traffic markings shall be removed.
3. Pavement cracks and joints greater than 6.3 mm wide shall be cleaned and flush filled with a material approved by the Engineer. No over banding will be permitted.
4. Surface irregularities greater than 25 mm deep shall be filled with a material approved by the Engineer.
5. The entire pavement surface to be overlaid shall be thoroughly cleaned, giving specific attention to accumulated mud and debris. Pressurized water and/or vacuum systems may be required to insure a clean surface.

D. Paving Equipment - The self-priming paving machine shall be capable of spraying the tack coat, applying the hot asphalt concrete overlay and smoothing the surface of the mat in one pass at the rate of 10 - 30 m/minute. The self-priming paving machine shall incorporate a receiving hopper, feed conveyor, insulated storage tank for emulsion, tack coat spray bar and a variable width, heated, ironing type screed. The screed shall have the ability to be crowned at the center both positively and negatively and have vertically adjustable extensions to accommodate the desired pavement profile.

E. Compaction - Compaction of the wearing course shall consist of a minimum of two passes with a steel double drum asphalt roller of minimum weight of 10 metric tons, before the material temperature has fallen below 85°C. At no time shall the roller or rollers be allowed to remain stationary on the freshly placed asphalt concrete. Compaction shall immediately follow the placement of the Paver Placed Surface Treatment/Ultrathin Hot Mix Asphalt Concrete Wearing Course with an approved asphalt roller(s). Roller(s) shall be well maintained and be in reliable operating condition, weight not less than 10 metric tons, be equipped with functioning water system

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and scrappers to prevent adhesion of the fresh mix onto the roller drums. Adequate roller units shall be supplied so the compaction will be accomplished promptly following placement of the material. A release agent (added to the water system) may be required to prevent adhesion of the fresh mix to the roller drums and wheels.

METHOD OF MEASUREMENT

The Paver Placed Surface Treatment/Ultrathin Hot Asphalt Concrete Wearing Course shall be measured by the number of metric tons of pavement surfaced in accordance with this specification.

BASIS OF PAYMENT. The unit price bid per metric ton shall include all labor, materials and equipment necessary to complete the work.

Payment will be made under:

Item No.

03403.2210M

Paver Placed Surface Treatment Ultrathin Hot Mix
Asphalt Wearing Course , Type A

Pay Unit

Metric Ton

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Paver Placed Surface Treatment Ultrathin Hot Mix
Asphalt Wearing Course , Type B

Metric Ton

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Paver Placed Surface Treatment Ultrathin Hot Mix
Asphalt Wearing Course , Type C

Metric Ton