

**ITEM 05403.221212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE A F2**

**ITEM 05403.222212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE B F2**

**ITEM 05403.223212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE C F2**

This
Specification

has been

Disapproved
as a result of the
issuance of

EI 01-011

DESCRIPTION

The Paver Placed Surface Treatment consists of a warm-polymer modified asphalt emulsion coat followed immediately with an ultra thin hot mix asphalt wearing course. All necessary pavement repairs, crack sealing, joint sealing, pavement marking removal, utility adjustments and milling of rebates will be paid for under the appropriate items. This specification is for use on highways of all traffic volumes in the Upstate area, as defined in Chapter three of the Highway Design Manual. Quality Adjustment Factors do not apply for this item.

MATERIALS

A. Hot Mix Asphalt Wearing Course. The requirements of Section 401- Plant Mix Pavements - General and Section 402 - Quality Control Asphalt Concrete - General apply, except as modified herein. The Marshall Mix Property Criteria in §401-2.02 do not apply. Formulate a job mix formula that satisfies the design limits listed in Table 1- Mixture Requirements and submit it to the Regional Director for approval.

§402-4 Method of Measurement does not apply. If a test value for the 0.075 mm sieve, or any sieve larger than 1.18 mm varies from the target value by more than 1.5 times the production tolerance given in Table 1, the Regional Materials Engineer will evaluate the material represented by that test to determine acceptability. If for any sieve, the average absolute difference of [Test Value - Target Value] for a lot exceeds the production tolerance, the Regional Materials Engineer will evaluate the material to determine acceptability.

Table 1 - Mixture Requirements¹

Sieve Sizes (mm)	Type A		Type B		Type C	
	Design Limits % Passing	Production Tolerance %	Design Limits % Passing	Production Tolerance %	Design Limits % Passing	Production Tolerance %
19.0					100	
12.5			100		85 - 100	±4
9.5	100		85 - 100	±4	60 - 90	±4
6.3	85 - 100	±4	30 - 50	±4	30 - 50	±4
4.75	40 - 60	±3	24 - 40	±3	24 - 40	±3
2.36	21 - 32	±3	21 - 32	±3	21 - 32	±3
1.18	16 - 26	±3	16 - 26	±3	16 - 26	±3
0.600	12 - 20	±2	12 - 20	±2	12 - 20	±2
0.300	8 - 16	±2	8 - 16	±2	8-16	±2
0.150	5 - 10	±2	5 - 10	±2	5 - 10	±2
0.075	5 - 7	±2	5 - 7	±2	5 - 7	±2

**ITEM 05403.221212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE A F2**

**ITEM 05403.222212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE B F2**

**ITEM 05403.223212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
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% PGB	4.9 - 5.3	4.8 - 5.2	4.8 - 5.2 ²
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(1) All aggregate percentages are based on total mass of aggregate.

(2) The Director, Materials Bureau, will evaluate Type C designs with asphalt binder percentages between 5.2% and 5.4% at the Contractor's request.

1. **Asphalt Binder.** Use the appropriate performance graded binder for the project's location.

2. **Coarse Aggregate.** §703-02 - Coarse Aggregate, with the following additions. If the coarse aggregates are from more than one source or of more than one type of material, proportion and blend all constituents to provide a uniform mixture. Use 100% crushed stone from an approved source and meet one of the following requirements.

- a. Limestone having an acid insoluble residue content of not less than 20.0%, excluding particles of chert and similar siliceous rocks.
- b. Dolomite having an acid insoluble residue content of not less than 17.0%, excluding particles of chert and similar siliceous rocks.
- c. Sandstone, granite, chert, traprock, ore tailings, slag or other similar non-carbonate materials. Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.
- d. Gravel, or a natural or manufactured blend of the following types of materials: limestone, dolomite (excluding Wappinger dolomite, as defined by the Department), gravel, sandstone, granite, chert, traprock, ore tailings, slag or other similar materials, meeting the following requirements:

Type C Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 9.5 mm particles must be non-carbonate.

Type B Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 6.3 mm particles must be non-carbonate.

Type A Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 4.75 mm particles must be non-carbonate.

**ITEM 05403.221212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE A F2**

**ITEM 05403.222212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE B F2**

**ITEM 05403.223212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE C F2**

This
Specification

Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.

- e. Manufactured blend of Wappinger dolomite (as defined by the Department) and the following types of materials: gravel, sandstone, granite, chert, traprock, ore tailings, slag, or other similar materials meeting the following requirements:

Type C Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 30.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 95.0% of plus 9.5 mm particles must be non-carbonate.

Type B Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 30.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 95.0% of plus 6.3 mm particles must be non-carbonate.

Type A Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 30.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 95.0% of plus 4.75 mm particles must be non-carbonate.

Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.

Table 2 - Coarse Aggregate Properties

Property	Method	Requirement
LA Abrasion Coefficient, maximum % loss	AASHTO T96	25
Maximum Flakiness Index	NFP 18-561	20
Maximum Flakiness Coefficient (G/E) ¹	NFP 18-561	1.58
Maximum percent passing #600µm, %	AASHTO T11, T27	2

(1) Where G is the smallest square opening the particle can pass through and E is the smallest slot the particle can pass through.

It is recommended that the coarse aggregate portion (plus 2.36 mm material) meet the gradation requirements given in Table 3 - Coarse Aggregate Gradation.

ITEM 05403.221212 M - PAVER PLACED SURFACE TREATMENT UPSTATE TYPE A F2

ITEM 05403.222212 M - PAVER PLACED SURFACE TREATMENT UPSTATE TYPE B F2

ITEM 05403.223212 M - PAVER PLACED SURFACE TREATMENT UPSTATE TYPE C F2

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Specification

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Table 3 - Recommended Coarse Aggregate Gradation

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

3. **Fine Aggregate.** §703-01 Fine Aggregate, with the following additions. Use 100% crushed stone having a minimum sand equivalent of 60%, as determined by AASHTO T176, "Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test." It is recommended that the fine aggregate portion (minus 4.75 mm material) meet the gradation requirements given in Table 4 - Fine Aggregate Gradation.

Table 4 - Recommended Fine Aggregate Gradation

Sieve Size	Percent 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

4. **Mineral Filler.** §703-08 - Mineral Filler.

- B. Polymer Modified Asphalt Emulsion.** CRS-1, Item 702-4001, except as modified in Table 5 - Polymer Modified Asphalt Emulsion Material Properties. Mill or blend the polymer modifier into the asphalt emulsion base or the emulsifying agent prior to the emulsification process.

ITEM 05403.221212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE A F2

ITEM 05403.222212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE B F2

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Table 5 - Polymer Modified Asphalt Emulsion Material Properties

Property	Method	Minimum	Maximum
Polymer Content, % Mass of Total Residue	--	3.0	--
Demulsibility	ASTM D244	40	-

C. Equipment.

- 1. Paving.** Use a self-priming paver appearing on the Department's Approved List. The self-priming paver must be capable of spraying the polymer modified asphalt emulsion, applying the hot asphalt overlay and smoothing the surface of the mat in one pass at a rate of at least 10 m/minute. The self-priming paver must be equipped with a receiving hopper, feed conveyor, emulsion storage tank, metered high-pressure emulsion spray bar and a variable width, heated, ironing-type screed. The screed must have the ability to be crowned at the center both positively and negatively and have vertically adjustable extensions to accommodate the desired pavement profile. Make equipment approval requests to the Director, Materials Bureau, at least 30 days before the start of work.
- 2. Compaction.** Use steel wheeled double drum rollers weighing at least 9 metric tons, equipped with functioning water systems and scrapers to prevent material from adhering to the roller drums.

CONSTRUCTION DETAILS

A. Surface Preparation. Perform all surface preparation prior to applying the wearing course.

1. Cover all manhole covers, water boxes, catch basins and other such utility structures with plastic or building felt. Reference each for location and adjustment after paving.
2. Thoroughly clean the entire area to be overlaid.
3. Remove all debris and standing water. A damp surface is acceptable if favorable weather conditions are expected during paving operations.

B. Application. The requirements of §401-3.01 Weather and Seasonal Limitations apply, except as modified herein. Placement may begin if the surface temperature is at least 7°C and rising. The finished treatment has a minimum thickness of 12.5 mm for Type A and 16 mm for Types B and C.

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TYPE A F2**

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TYPE B F2**

**ITEM 05403.223212 M - PAVER PLACED SURFACE TREATMENT UPSTATE
TYPE C F2**

This
Specification

1. Apply the polymer modified asphalt emulsion at a temperature of 60-80°C. Provide a uniform application across the entire width to be overlaid, at a rate of 0.68-1.13 L/m². Continuously monitor the spray rate.
2. No equipment shall come in contact with the polymer modified asphalt emulsion before the hot mix asphalt wearing course is applied.
3. Immediately after applying the polymer modified asphalt emulsion, apply the hot mix asphalt overlay across the full width of the emulsion at a temperature of 150-175°C.

C. *Compaction.* Begin compaction immediately after application of the wearing course. Use a minimum of two static passes. Avoid using vibratory compaction. The roller(s) will not be allowed to stop on the freshly placed wearing course. Use an adequate number of rollers to complete compaction before the pavement temperature falls below 85°C. Protect the wearing course from traffic until the rolling operation is complete and the material has cooled sufficiently to resist damage.

METHOD OF MEASUREMENT

The Paver Placed Surface Treatment will be measured as the number of square meters of pavement surfaced. §402-4 Method of Measurement does not apply.

BASIS OF PAYMENT

The unit price bid per square meter shall include all labor, materials and equipment necessary to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
05403.221212 M	Paver Placed Surface Treatment Upstate Type A, F2	square meter
05403.222212 M	Paver Placed Surface Treatment Upstate Type B, F2	square meter
05403.223212 M	Paver Placed Surface Treatment Upstate Type C, F2	square meter