

6.3 MM POLYMER-MODIFIED BITUMINOUS CONCRETE PAVEMENT

**\*\*Note: This specification requires the inclusion of the EMULSIFIED ASPHALT specification under Section 900.**

**\*\*From Bethel-Brookfield IM SURF(54)**

- xx. DESCRIPTION. This work shall consist of constructing one or more courses of bituminous mixture on a prepared foundation in accordance with these specifications and the specific requirements of the type of surface being placed, and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the Plans or established by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 490 of the Standard Specifications, except as modified below.

- xx. MATERIALS. The grade of the base Performance-Graded (PG) asphalt binder shall be PG 58-28.

Emulsified asphalt shall meet the requirements of EMULSIFIED ASPHALT of Section 900.

Aggregate shall meet the requirements of Subsection 704.10(b), except as modified herein.

The SBR latex polymer shall be a cold polymerized unvulcanized styrene butadiene rubber in latex form. It shall be specially compounded for addition at the Contractor's hot mix plant to obtain optimum dispersion in the asphalt paving mixture when added in a batch type pug mill mixer or a drum mixer. Prior to the start of production of the Polymer-Modified Bituminous Concrete Pavement, the SBR latex supplier shall provide to the Engineer a Type D certification in accordance with Subsection 700.02 certifying test results showing the SBR Latex conforms to the following:

Type of Latex:	Anionic SBR
Color:	White
Styrene/Butadiene Ratio:	24±2/76±2
Total Polymer Solids, % by weight:	60-72
Residual Styrene, % by weight:	0.1 max
Ash, % total rubber solids by weight:	3.5 max
pH:	9-11
Viscosity, Brookfield Units:	1500 max
(Model RVF, spindle No.2, @ 20rpm @ 25°C)	

The SBS copolymer shall be a solid, 99+% polymer, and shall be pre-blended with the specified PG asphalt at a terminal. Prior to the start of production of the Polymer-Modified Bituminous Concrete Pavement, the SBS copolymer modified PG asphalt supplier shall provide to the Engineer a Type D certification in accordance with Subsection 700.02 certifying test results showing the SBS copolymer conforms to the following:

Type of Polymer:	SBS
Color:	White Pellets
Styrene/Butadiene Ratio:	30±3/70±3
Total Polymer Solids, % by weight:	>99%
Ash, % dusting agent:	<0.5%
pH:	Neutral
Specific Gravity:	0.94

- xx. COMPOSITION OF MIXTURE. The combined PG asphalt binder and SBR latex or SBS copolymer content shall meet the approved mix design requirements. The quantities of PG asphalt binder and SBR latex or SBS copolymer shall be as required to produce a composition of 97±0.3 percent asphalt binder to 3±0.3 percent SBR latex polymer or SBS copolymer solids by weight.

The minimum asphalt binder content for the mixture shall be 6.0 percent.

The furnished mixture shall not contain recycled asphalt pavement (RAP).

TABLE 1 - 6.3 MM POLYMER-MODIFIED BCP DESIGN CONTROL POINTS

Standard Sieve	Percent Passing Criteria	
	Minimum	Maximum
9.5 mm (3/8 inch)	100	-
6.30 (1/4 inch)	90	100
4.75 (No. 4)	-	90
2.36 (No. 8)	37	70
0.075 (No. 200)	2	10

TABLE 2 - 6.3 MM POLYMER-MODIFIED BCP MIXTURE ADDITIONAL AGGREGATE CRITERIA

Coarse Aggregate Angularity (Percent) Minimum	Uncompacted Void Content of Fine Aggregate (Percent) Minimum	Flat-and-elongated Particles (Percent) Maximum	Sand Equivalent (Percent) Minimum
95/90	45	10	45

TABLE 3 - 6.3 MM POLYMER-MODIFIED BCP VOLUMETRIC DESIGN CRITERIA

% Air Voids	% Voids Filled with Binder		% Voids in Mineral Aggregate, Minimum
	Minimum	Maximum	
4.0	70	78	16

TABLE 4 - 6.3 MM POLYMER-MODIFIED BCP DESIGN NUMBER OF GYRATIONS

Compactive Effort	N-Initial	N-Design	N-Maximum
Number of Gyrations	7	65	115

TABLE 5 - 6.3 MM POLYMER-MODIFIED BCP PRODUCTION GRADATION  
TOLERANCES

Sieve Size	9.5 mm (3/8 inch)	6.3 mm (1/4 inch)	4.75 mm (No. 4)	2.36 mm (No. 8)	1.18 mm (No. 16)	0.600 mm (No. 30)	0.300 mm (No. 50)	0.150 mm (No. 100)	0.075 mm (No. 200)
Tolerance	-	± 4	± 3	± 3	± 3	± 2	± 2	± 2	± 1

- xx. MIXING. For SBR latex polymer-modified mixtures, the aggregate shall be mixed dry prior to adding the PG asphalt binder. The PG asphalt binder shall then be added and mixing continued until all of the aggregate is completely coated. The SBR latex shall then be added to the coated aggregate and mixing continued for not less than 30 seconds. These mixing times shall be specified on the approved mix design.

The equipment for adding the SBR latex shall be capable of monitoring and printed output to report actual usage of the material. The following printed output shall be made available to the Engineer for each batch slip containing the following information:

- (a) Equipment Unit number.
- (b) Time (nearest minute) and date stamp.
- (c) Sequential batch number.
- (d) Batch Gallons delivered.
- (e) Total gallons used.

The original printed output shall become the property of the Agency.

The temperature of the mixture when discharged from the plant shall be within the range specified in the approved mix design to provide good workability.

- xx. CONDITIONING OF EXISTING SURFACE. All surfaces shall be cleaned and sprayed with an asphalt emulsion meeting the requirements of these provisions before placing any bituminous mixture, unless otherwise ordered by the Engineer. The emulsion shall be applied at a rate of 0.08 gal/yd<sup>2</sup> (+/- 0.01 gal/yd<sup>2</sup>). The application shall be made just prior to the placement of the bituminous concrete mixture and shall progress sufficiently ahead of the paving so that the emulsion application has had the opportunity to break. Equipment used to apply the emulsion shall meet the requirements for distributors specified in Subsection 404.04.

Prior to paving, bridge decks shall be treated as detailed on the Plans.

All surface preparation shall take place prior to paving as specified on the Plans.

Contact surfaces such as curbing, gutters, and manholes shall be painted with a thin, uniform coat of emulsified asphalt meeting the requirements of these provisions before the bituminous mixture is placed against them.

Where existing pavement surfaces contain irregularities, depressions, or waves, such deficiencies shall be eliminated by the use of extra bituminous material for spot leveling to bring the existing surface to uniform section and grade before placing the new wearing surface.

- xx. COMPACTION. Compaction shall meet the requirements of Subsection 490.14, with the following exceptions:

Pneumatic rubber tired rollers shall not be used to compact 6.3 MM Polymer-Modified Bituminous Concrete Pavement.

The recommended number of passes by the compaction train shall be two vibratory passes followed by two static passes. All passes shall be completed before the mat temperature falls below 120°C (250°F). The Engineer may change the number of passes in order to obtain acceptable results.

If the Engineer determines that unsatisfactory compaction is being obtained, unacceptable surface distortion is occurring, or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment.

- xx. METHOD OF MEASUREMENT. The quantity of Special Provision (6.3 MM Polymer-Modified Bituminous Concrete Pavement) to be measured for payment will be the number of metric tons (tons) for a lot of mixture complete in place in the accepted work as determined from the weigh tickets.

The quantity of Air Voids Pay Adjustment will be determined as specified in Subsection 490.18.

- xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (6.3 MM Polymer-Modified Bituminous Concrete Pavement) will be paid for at the Contract unit price per metric ton (ton). Payment will be full compensation for furnishing, mixing, hauling, and placing the material specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for Pay Adjustments shall be debited or credited against the Contract prices (Lump Units) bid for the applicable Pay Adjustment items.

The costs of furnishing testing facilities and supplies at the plant will be considered included in the Contract unit price bid for Special Provision (6.3 MM Polymer-Modified Bituminous Concrete Pavement).

The costs of obtaining, furnishing, transporting, and providing the straightedges required by Subsection 490.16 will be paid for

under the appropriate Section 631 pay item included in the Contract.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.680 Special Provision (6.3 MM Polymer-Modified Bituminous Concrete Pavement) (SBR or SBS Polymer)	Metric Ton (Ton)