
Appendix J: Construction Specifications



All construction items referenced in the report shall conform to the requirements of the Ohio Department of Transportation's Construction and Material Specifications and Supplemental Specifications (current versions) except for the following items.

Item Special – Mastic Surface Seal

1.0 Description

This work shall consist of mixing cationic asphalt emulsion, aggregate, water, and other additives as needed and applying the mixture on the pavement as shown on the plans or as directed by the engineer. The mastic surface seal product shall be Onyx mastic surface treatment or approved equal.

2.0 Material Requirements

2.1 Asphalt Emulsion

Bituminous material shall be an asphalt emulsion, grade CSS-1H, in accordance with the following table. The bituminous material shall show no separation after mixing. The emulsion shall be sampled in accordance with AASHTO T 40.

CSS-1H	Min.	Max.
Viscosity, Saybolt Furol at 25° C, seconds	10	90
Particle charge test	Positive+	
Sieve test, %	--	0.50#
Residue, %	57	--
Test on Residue from Distillation	Min.	Max.
Penetration, 25° C, 100 g, 5 s	30	150

* The storage stability test may be waived provided the asphalt emulsion storage tank at the mixing site has adequate provisions for circulating the entire contents of the tank, and provided satisfactory field results are obtained.

+ If the particle charge test is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

The sieve test may be waived if material applies without clogging nozzles and satisfactory field results are obtained.

2.2 Aggregate

2.2.1 The composite aggregate/mineral filler blend shall be free of cemented or conglomerated material and shall not have any detrimental material. Note: High mineral filler mixtures may require separate tests to be run on the aggregate/mineral filler components and gradation verifications accomplished the stated blend percentages.

Sieve	Percent Passing
No. 8 (2.36 mm)	100
No. 16 (1.18 mm)	95-100
No. 30 (600 mm)	85-100
No. 50 (300 mm)	40-70
No. 100 (150 mm)	30-60
No. 200 (75 mm)	25-65

2.2.2 Aggregate for sources shall be in accordance with the following aggregate requirements.

Property	Percent Maximum Limit
Absorption, AASHTO T 85, percent, max	n/a
Micro-Deval, AASHTO TP 58, percent, max	20

2.3 Water

Water shall be potable and free of harmful soluble salts.

2.4 Additives

Any other material added to the mixture or to any of the component materials to provide the required properties shall be supplied by the manufacturer.

3.0 Job Mix Formula

The manufacturer shall develop the job mix formula and shall present certified test results for the engineer's approval prior to use. Mix acceptance will be subject to satisfactory field performance. The mixture shall contain a minimum of 30% aggregate by weight of mixture following ignition oven and shall meet the following requirements.

Mix design requirements:

	Min.	Max.	Test Method
Wet-Track Abrasion Loss (3 day) Soak, g/m ²	--	80	TB 100 (ISSA) Modified
Asphalt Content by Ignition Method, percent	30	--	AASHTO T-308-08*

* This method is modified to account for a high asphalt fine aggregate mixture.

4.0 Equipment

4.1 Mixing Equipment

The mixture shall be mixed thru a central mixing plant. Aggregate, asphalt emulsion, water and additives shall be proportioned by volume or weight (mass) utilizing the mix design approved by the engineer. The tank shall be equipped with a full sweep agitator capable of producing a homogeneous mastic surface treatment mix.

4.1.1 Individual volume or weight (mass) controls for proportioning each item to be added to the mix shall be provided. Each material control device shall be calibrated and properly marked. Each device shall be accessible for ready calibration and placed such that the contractor and the engineer may determine the amount of each material used at the time.

4.2 Mobile Distribution Unit (MDU)

The MDU shall be fully self-contained and shall have a storage tank with full sweep agitation, hydraulic system, operator controls, pumping system, material filters and spray bar capable of applying a full lane width. The equipment shall have sufficient available power to operate the full spray system and the agitation system at the same time.

4.2.1 As material is delivered to the job site and applied, the proportion of the mixture shall be maintained as it was manufactured per the mix design.

4.2.2 The storage tank shall have an internal full sweep mixing system. The storage tank shall have sufficient mixing capability to assure proper suspension of fine aggregates in the surfacing mix.

4.2.3 The MDU shall be equipped with a system allowing the measurement and calculation of application rates.

4.2.4 The pumps shall provide operation resulting in high volume and low potential for cavitation. The pumps shall be engineered to allow the system to handle fine aggregate filled materials.

4.2.5 The applicator spray bar shall be sized with volumetric capacity to dampen any possible pressure ripples by providing even pressure to all spray tips. Attachments such as a spray shield and wind deflector shall be available.

5.0 Construction Requirements

5.1 Surface Preparation

The surface shall be thoroughly cleaned of all vegetation, loose material, dirt, mud, and other objectionable material immediately prior to application of the mixture.

5.2 Weather Limitations

Mixture shall not be placed when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 60°F, when it is raining, when there is a chance of temperatures below 32° Fahrenheit (0° Celsius) within 24 hours after placement, or as directed by the engineer.

5.3 Dilution

Contractor shall not dilute mixture in the field with water or any other additive except as approved by the manufacturer.

5.4 Placement

The exact rate will be shown on the plans or as directed by the engineer. The application shall be 0.10 gal/SY per pass. Placement of the mix shall be performed in two passes with a coverage of 0.20 gal/SY.

5.4.1 The mixture shall be uniform and homogeneous after applying on the existing pavement and shall not show separation of the emulsion and aggregate after setting.

5.4.2 Contractor shall provide a mat ensuring total coverage and especially free of voids and pit holes.

5.4.3 After application, the pavement shall remain closed until the surface is tack-free and capable of being open to traffic without tracking.

5.5 Method of Measurement

Measurement of mastic surface treatment will be made to the nearest gallon (gal), complete in place, and accepted by the engineer.

5.6 Basis of Payment

The accepted quantity of mastic surface treatment will be paid for at the contract unit price.

Item Special – Pressure Treated Landscape Timbers

Landscape Timbers are to be pressure treated 6" x 8" x 8' No. 2 SFS Southern Yellow Pine. All timbers are to be from heartwood with no more than twenty (20%) percent sapwood. Timbers are to be treated with safe environmentally non-toxic treatment materials that meet ODOT 712.06 for "Ground Contact Use". Minimum chemical retention shall be 0.15 pounds per cubic foot.

Double hot dipped galvanized nails and/or fasteners shall be used to secure timbers.

Any surface of the timbers which has been cut in the field, or shop, which has not been pressure treated shall be swabbed with the pressure treatment preservative noted above, prior to installation.

No existing timbers shall be salvaged from the project. All timbers required for the project shall be new and shall conform to these specifications.

