**SECTION 636 – POLYMER CEMENT SURFACING FOR ASPHALT AND CONCRETE SURFACES**

**DESCRIPTION**

**636.01 Description**

This work consists of installing a polymer cement surface system (PCSS) (colored or base color) on a prepared substrate in accordance with these specifications and with the plans established by the engineer. The resulting surface may be patterned or monolithic as required by the design plans. The work shall be performed utilizing the products, processes, equipment, and certifications of Endurablend™ Systems, or an approved equal. Materials shall have proven in-place history over asphalt and/or concrete and should meet all the material properties and be installed in accordance with this specification.

**MATERIAL**

**636.02 Materials**

The PCSS material used shall meet the requirements of Sections 636.02.01.

**636.02.01 PCSS Material Properties**

The polymer cement surface, or approved equal shall provide a skid and abrasion resistant surface and meet or exceed the requirements in Table 636.2.1, which are included in the specifications or specified by the engineer.

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| **Table 636.2.1. Polymer Cement Material Properties** |
| **Description** | **Test Method** | **Value** |
| Compressive Strength, (at 28 days) 2” Cube **1** | ASTM C-109 | > 3,100 PSI |
| Tensile Strength **1** | ASTM C-190 | > 700 PSI |
| Bond Strength with Asphalt **1, 2** | ASTM C-1583 | > 250 PSI |
| Bond Strength with Concrete**1** | ASTM C-1583-13 | > 250 PSI |
| Skid Resistance (at 60km/hr) | ASTM E-1911ASTM E-274 | > 40> 40 |
| Length Change **1**  | ASTM C-157 | < 0.024%  |
| Solar Reflectivity Index **3, 4** | ASTM C-1549ASTM E-1980 | > 29 |
| Flexibility **5** | ½” Thick Beam under Static Load – Max. Deflection | ≥ ½” |

**1**) The data shown is representative of laboratory test 28 day cured samples at 50% humidity.

**2**) Test sample must be prepared by overlaying ¼” (6mm) of product on 12.5mm HMA sample.

**3**) A SRI of greater than 29 can be obtained by using pigments or changing the color index of the aggregate. It is not applicable where color pigments are requested.

**4**) Only applicable for projects where a LEED certification credit is a requirement of the surfacing or where a reflective surfacing is specified.

**5**) Use the same loading rate as for the ASTM C-109 test above.

♣) Quality assurance tests for site

**636.02.02** **Admixtures AND Pigments**

Any chemical admixtures and/or color pigments used, the dosage rates and the conditions for use in the PCSS shall be approved by the manufacturer.

Red brick application must be 5% by weight crushed red granite.

**636.02.03** **Sealer**

PCSS must be sealed after curing using Euclid Chemical EverClear or approved pure acrylic sealer compatible with the PCSS.

Sealer must be placed and cured in accordance with manufacturer’s recommendation prior to opening the corridor to traffic.

**636.02.04 WARRANTY**

Warranty all polymer cement surfacing material against manufacturing and installation defects for a period of two years after the date of substantial completion.

**CONSTRUCTION**

**636.03.01 Delivery, Storage, and Handling**

The material shall be delivered to site in weatherproof containers and stored in a covered and ventilated location.

**636.03.02 Equipment**

The equipment to be used shall be approved by the manufacturer or an approved installer. The installer shall demonstrate that the equipment shall be capable of handling materials, performing the work, maintaining proper material temperature, maintaining the minimum level of required productivity, and producing a product of the specified quality and be maintained in good mechanical condition. The contractor shall also provide sufficient equipment to enable the prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

**636.03.03 Material Handling Equipment**

The equipment shall be capable of handling and transferring the dry materials and liquids to the approved mixer without causing spillage, segregation, or contamination.

**636.03.04 Weather Limitations**

A. Required Conditions

PCSS shall only be placed when all of the following conditions are met:

* The pavement surface is dry.
* Ambient and substrate temperatures are 50° F (10° C) and rising and expected to remain above 50° F (10° C) for 6 hours
* There is no forecast of temperatures below 35° F (2° C) within 24 hours from the time of placement.
* The weather is not foggy or rainy. When rain appears imminent, all placement operations shall cease and the work shall not be resumed until the threat of rain has passed.

B. Cold Weather Requirements

When the ambient temperature is below 50° F (10° C), but will remain above 40° F (5° C) during paving and the substrate temperatures are 50° F (10° C) and rising, the PCSS can be placed only when manufacturer approved accelerators are added to the mix and approval of the Engineer is obtained.

C. Hot Weather Requirements

Care should be taken when placing the PCSS when the substrate temperature exceeds 130° F (50° C). Application temperatures of the substrate above 130° F (50° C) should be closely monitored for performance during the course of application. Any observable defects occurring as a result of extreme temperature should be cause for immediate halting of placement operations.

Where the ambient paving air temperature is going to exceed 90° F (32° C) then the use of cold water and ice should be considered for the blending operation. Where the provision of cold water or replacing the part of the water requirement with ice is not possible, then the use of a retarder should be used with the mix.

**636.03.05 Surface Preparation**

The substrate that is to receive the PCSS system shall be cleaned of sand, dirt, dust, rock, or any other debris that could prevent proper adhesion. Cleaning shall be accomplished by power broom, scraping, blowing, washing, or other approved methods necessary to assure bonding between the PCSS surface course and the substrate. PCSS operations shall not be started until the surface is in a condition as recommended by the manufacturer.

**636.03.06 Damaged Substrate**

All substrate receiving PCSS shall be free of potholes, spalling, or other areas of structural deterioration. If identified in the plans, or directed by the Engineer, all such areas shall be excavated to a depth where the substrate is structurally sound and repaired with an approved pothole repair method. Structurally deficient areas not identified for repair in the plans shall be reported to the Engineer.

**636.03.07 Mixing**

The measuring and mixing operation shall be capable of producing a consistent homogeneous mix sufficient to maintain the production levels required for the work. The water and dry blend shall be charged into the mixer and blended to the desired consistency while maintaining effective temperatures to prevent flashing of the mix. **Hand mixing in pails is not permissible.**

**636.03.08 Placing**

1. PCSS shall not be applied within 14 days after laying and rolling bituminous asphalt pavement or concrete pavement.
2. Joints between both similar and different substrates, must be perpetuated. Surface shall be prepared to allow for joint perpetuation prior to installation of the PCSS system.
3. PCSS shall be uniformly deposited on the substrate by roto-stator spray equipment. The spray apparatus shall be a device approved by the manufacturer and have the capability of mixing the materials at a rate to insure continuous spray operations. With the stenciled design the base coat may be placed with a squeegee.
4. Stenciled Pavement

This design requires a base coat of the material to be applied by squeegee or spray on top of asphalt or concrete pavement. Concrete pavement may require shot blasting to roughen the surface to ensure proper bonding. The base coat provides a grout line color plus seals the surface. Once the base coat has cured, apply the specified stencil pattern and spray the top coat. Remove stencil when the top coat has reached the proper consistency and allow coating to cure. Cure to traffic time is approximately 2 hours at 70 degrees. The total cured thickness should be between 1/8” and 3/16”.

The stencils should be a plastic or paper pattern consistent with the design of the crosswalks.

1. Non-Patterned Application

This design uses a colored or base color coating without a decorative pattern. Apply the material to the asphalt or concrete pavement using roto-stator spray apparatus. Concrete pavement may require shot blasting to roughen the surface to ensure proper bonding. A smooth or textured surface can be created. A textured surface is achieved by adding aggregate to the mix or distributing a fine aggregate to the surface after application as specified in the plans. Cure to traffic time is approximately 2 hours at 70 degrees. The total cured thickness should be between 1/8” and 3/16”.

**636.03.09 Curing and Opening to Traffic**

Care shall be taken by the contractor to protect the PCSS surface course from traffic until the area is sufficiently cured. Curing time will vary depending on ambient and surface temperatures. The PCSS shall not be opened to traffic until it has reached sufficient compressive strength that the surface will not be damaged by vehicular traffic and the area has been approved for opening by a representative of the manufacturer, the installer, or the Engineer.

**METHOD OF MEASUREMENT**

**636.04.01 Measurement**

The quantity of DECORATIVE CROSS WALK MARKINGS - (INTERSECTION) will be measured per square foot.

**BASIS OF PAYMENT**

**636.05.01 BASIS OF PAYMENT**

The accepted quantity of DECORATIVE CROSS WALK MARKINGS - (INTERSECTION) will be paid for at the contract price per square foot and shall include all materials, equipment, labor and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer

Payment will be made under:

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| --- | --- | --- |
| **ITEM NO.** | **ITEM DESCRIPTION** | **UOM** |
| 636.0010 | DECORATIVE CROSS WALK MARKINGS | SF |

**END OF SECTION 636**