

SECTION 321723 TRAFFIC PATTERNS® – DECORATIVE INTERCONNECTED PAVEMENT MARKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

- 1. Section [321216] - "Asphalt Paving" for new asphalt pavement.
- 2. Section {321223} – Decorative Pavement Markings

1.3 SUMMARY

- A. Decorative interconnected pavement marking shall consist of a durable aggregate reinforced preformed thermoplastic pavement marking system (herein "System") that provides a textured, aesthetically attractive and durable topical treatment to the surface of the asphalt or concrete pavement.
- B. The System is intended for use on asphalt or concrete pavements to create traffic calming solutions for decorative crosswalks, medians, intersections, logos and signage. It is applied over pavement to create functional decorative crosswalks, intersections, medians and roundabouts as shown on the Contract Drawings.
- C. All System materials shall be produced under a quality system as specified in this section and designed to provide durability, load carrying capacity and architectural compatibility with the location. All raw materials shall be graded for consistency and quality to obtain the required standards.
- D. The System shall be installed to the existing substrate.
- E. Only accredited or qualified decorative interconnected system installers authorized by the applicable manufacturer of the decorative interconnected product may perform this work.

1.4 UNIT PRICES

- A. Work under this Section is based on labor and materials per project.
- B. Method of Measurement: The work will be measured by the installed area of square feet, measured and accepted in place. No deduction will be made for the area(s) occupied by manholes, inlets, drainage structures, bollards or by any public utility appurtenances within the area.

- C. Basis of Payment: This work will be paid for at the Contract unit price per square foot for “Decorative Interconnected Pavement Marking” and accepted in place. Price shall include all materials, equipment, tools and labor incidental thereto. There will be no separate payment for surface preparation; but the cost of this work shall be considered as included in the general cost of the work.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site (Insert location)**.
- B. Conference shall consist of **Owner, Owners Representative, Engineer, Landscape Architect, Accredited or Qualified Installer, manufacturer’s representative**.

1.6 DEFINITIONS

- A. “HMA pavement” is Hot Mix Asphalt pavement.
- B. “PCC pavement” is Portland Cement Concrete pavement.
- C. “Owner” means the Owner and refers to the representative person of the Owner who has decision making authority for the Work. The “owner” typically references the city, county, or government entity agreeing to the project’s purchase.
- D. “Accredited or Qualified Installer” refers to a contractor authorized by the System manufacturer to install the decorative interconnected pavement marking (system).

1.7 SUBMITTALS

- A. Product Data: For each type of product per manufacturer’s offering.
- B. Manufacturer Data: System type and product type
- C. Samples for Initial Selection: For each type of product requiring color selection.
Samples for Verification: For each pattern and color in manufacturer's standard sizes.
- D. The Accredited or Qualified Installer shall provide written proof of their accreditation.
- E. The Accredited or Qualified Installer shall gain confirmation of correct decorative interconnected pattern(s) and colors from the **[Owner, Owners Representative, Engineer, Landscape Architect** prior to starting the Work.
- F. The Accredited or Qualified Installer shall supply three references of work of a similar nature provided to a **[Owner, Owners Representative, Engineer, Landscape Architect]** <insert other> within the State of <insert state>.
- G. Construction of mock-up (shall be a minimum of a 6’x6’ section for each color and stamp pattern specified).

H. The System manufacturer must be ISO 9001:2015 certified for design, development and manufacturing of preformed thermoplastic, and provide proof of current certification.

I. Shop Drawings:

Indicate decorative interconnected pavement marking patterns, colors, and dimensions to adjacent work.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Accredited or Qualified Installer required for this Project.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of <Insert applicable standards> of <Insert name of state or local DOT> for decorative interconnected pavement marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Proceed with decorative interconnected pavement marking only when air temperature is at least 45 deg F (7.2 deg C) and rising. Proceed only if no precipitation is expected. Ensure there is no moisture in the substrate prior to application. Surface should not have any frost or moisture present. High winds could also affect the installation of the material.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturer -

Basis of Design – Ennis-Flint, Inc. TrafficScapes® - TrafficPatterns® interconnected surface system

1. Contact www.ennisflint.com

B. DECORATIVE INTERCONNECTED PAVEMENT MARKING MATERIAL

1. Preformed Thermoplastic Material: Must be composed of an ester modified rosin, impervious to degradation by motor fuels and lubricants, in conjunction with aggregates, pigments, binders, and anti-skid/anti-slip elements. Pigments and anti-skid/anti-slip elements must be uniformly distributed throughout the material. The material conforms to AASHTO designation M249, except for relevant differences due to the material being supplied in a preformed state, being non-reflective, and potentially being of a color different from white or yellow.

2. The System shall utilize an aggregate reinforced preformed thermoplastic product which contains a minimum of thirty percent (30%) intermixed anti-skid/anti-slip elements and

where the top surface contains anti- skid/anti-slip elements. These anti-skid/anti-slip elements must have a minimum hardness of 8 (Mohs scale).

3. The System must be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, and hydraulic fluids.
 4. Pigments:
 - a. White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.
 - b. Other Colors: The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200, in amounts exceeding permissible limits as specified in relevant Federal Regulations.
 5. Skid Resistance: The surface of the material shall contain factory applied anti-skid/anti-slip elements with a minimum hardness of 8 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.
 6. Slip Resistance: The surface of the preformed thermoplastic material shall contain factory applied anti-skid material with a minimum hardness of 8 (Mohs scale). Upon application the material shall provide a minimum static friction of coefficient of 0.6 when tested according to ASTM C 1028 (wet and dry), and a minimum static coefficient of friction of 0.6 when tested according to ASTM D 2047.
 7. Thickness: The material must be supplied at a minimum thickness of 125 mil (3.2mm).
 8. Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.
 9. Interconnected: The material must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each material segment, typically 24 in. (61 cm) by 36 in. (91 cm), must be factory assembled and interconnected with a compatible material so that in the field it is not necessary to assemble the individual pieces within a material segment.
- C. HEATING EQUIPMENT: Infrared heating equipment is designed specifically to elevate the temperature of the preformed thermoplastic material and asphalt or concrete pavement without adversely affecting it and System manufacturer-approved infrared heating equipment must be used for application. For small areas requiring additional heat, a manufacturer approved torch may be used.
- D. MATERIALS SEALER: A two-part epoxy sealer specified and distributed by the System manufacturer must be applied to the substrate prior to material application to ensure proper adhesion, and to provide reinforcement for larger areas of material.
- E. MATERIALS AGGREGATE: Supplemental anti-skid/anti-slip elements to be applied to the surface of the molten preformed thermoplastic as needed, if the factory applied anti-skid/anti-slip

elements embed too deeply into the surface of the molten preformed thermoplastic material during the heating process. (Embedded aggregate is exposed upon wear for extended skid resistance.) The aggregate is distributed by the System manufacturer.

F. PATTERNS & COLORS

1. Patterns and colors are described below:
 - a. Decorative interconnected pavement marking - **Type A <insert use and/or location on drawings>**
Pattern: insert pattern design or custom design>
Color: (Standard/Premium) <insert color>
 - b. **<insert other color or design if required>**
2. Contractor shall verify all colors and patterns with owner's representative prior to placement.

- G. **SHELF LIFE AND STORAGE** The shelf life of decorative interconnected pavement marking materials is two years provided it is protected from the weather, specifically UV degradation and rain. The materials are to be stored in their original packaging and kept dry under cover and or as per manufacturer's specifications

PART 3- EXECUTION

3.1 EXAMINATION

- A. Verify that pavement is dry and in suitable condition to begin the installation process according to manufacturer's written instructions.
- B. Proceed with asphalt or concrete installation only after unsatisfactory conditions have been corrected.
- C. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt or concrete surface has been completed and that asphalt or concrete surface has been repaired flush with adjacent asphalt or concrete prior to beginning installation of the decorative interconnected pavement marking.

3.2 DECORATIVE INTERCONNECTED PAVEMENT MARKING SUBSTRATE

- A. General: Decorative interconnected pavement marking may be applied to both asphalt and concrete according to manufacturer's written instructions, using manufacturer's recommended equipment.
- B. PRE-CONDITIONS: Decorative interconnected pavement marking shall be installed over asphalt or concrete substrates that are firm, stable and in excellent condition; it must be free from defects such as cracks, settlement, visible seams, ruts, bird baths and spalling.
 1. Cracking, settlement and other deficiencies of the substrate will likely reflect through the decorative preformed thermoplastic. Good and proper construction procedures for the installation of the substrate must be followed in order to mitigate cracking of decorative preformed thermoplastic.

2. Surfaces with a high degree of porosity should be avoided due to the problems associated with entrapped water.
 3. Surfaces that may be subject to uncontrolled movement in either a horizontal or vertical direction shall be avoided as there may be a risk of reflective cracking through to the decorative preformed thermoplastic. Notify the engineer if these conditions are present before installing decorative preformed thermoplastic.
- D. **PREPARING OF THE SUBSTRATE:** All pavement substrates must be of high quality and stable for the installation of decorative interconnected pavement marking.

This Section is to be used as a guide to ensure a high-quality pavement substrate is provided and ready for the installation of the decorative System. It does not supersede other specifications pertaining to this Work, nor does it replace recommendations made by the engineer of record for this Work.

1. The base and sub-grade over which new pavement is installed must be firm and stable.
 2. The pavement mix must be designed for the intended use.
 3. The pavement must be installed in accordance with proper placement practices and these specifications.
 4. The asphalt or concrete pavement must cure properly before installing decorative interconnected pavement marking.
- E. **SURFACE PREPARATION:** The pavement surface shall be dry and clean: free of all dirt, debris, salts, concrete admixtures and any chemical residues.

1. Bituminous residue must be removed from new asphalt pavement surface prior to installation of decorative interconnected pavement marking.
2. Removal of contaminants may be done by brooming, compressed air, pressure washing (moisture must be removed and the surface dry as noted above) or, if necessary, light-grit blasting. Wire brush may be used to remove loose or powdery materials.

- F. **INSTALLATION OF DECORATIVE INTERCONNECTED PAVEMENT MARKING:** Decorative interconnected pavement marking System is to be installed only by an Accredited or Qualified Installer.

1. The System must be able to be applied to asphalt or concrete surfaces without pre-heating the application surface to a specific temperature.
2. The System is applied to asphalt or concrete pavement primarily using an infrared heating equipment. An approved hand-held propane heat torch distributed by the System manufacturer shall be used to heat isolated areas of the preformed thermoplastic.
3. A specialized sealer dispensing gun, handheld finishing tool and aggregate is used as part of the installation process
4. The aggregate reinforced preformed thermoplastic is typically supplied in panels measuring 2 ft. x 3 ft. [$\pm\frac{1}{8}$ in.] (.61m x .91m [± 3 mm]).
5. The System is available in a variety of standard colors and patterns.
6. The material must be able to be applied at ambient and road temperatures with a minimum temperature of 45°F (7°C) and rising.
7. A two-part epoxy sealer specified by the manufacturer must be applied to the substrate prior to preformed thermoplastic application. Immediately following sealer application, the

panels of aggregate reinforced preformed thermoplastic are positioned properly on the asphalt or concrete substrate with the aggregate side facing up. The preformed thermoplastic is then heated to the required melting temperature by use of a System manufacturer approved infrared heater. An approved hand-held propane heat torch distributed by the System manufacturer shall be used to heat isolated areas of the preformed thermoplastic. Additional aggregate may be applied to the preformed thermoplastic surface as needed following the melting process.

8. The preformed thermoplastic material is then allowed to cool thoroughly before being opened to vehicle or pedestrian traffic. (Consult the manufacturer's published application procedures for complete information.) The timing of opening traffic will be subject to exterior temperature conditions. More time may be required in hot weather. The Accredited or Qualified Installer can advise when the work is ready for traffic.

G. PACKAGING:

1. The TrafficPatterns[®] preformed thermoplastic material shall be packaged in cardboard cartons with a plastic sheet between each layer of preformed thermoplastic. The cartons in which the TrafficPatterns marking system is packed shall be non-returnable and shall not exceed 40 in. (1.02m) in length and 25 in. (0.64m) in width. The cartons shall be labeled for ease of identification. The weight of the individual carton must not exceed fifty (50) pounds (23 kg). A protective film around the carton must be applied to protect the TrafficPatterns preformed thermoplastic material from rain or premature aging.

H. TECHNICAL SERVICES:

1. The successful bidder shall provide technical services as required.

END OF SECTION 321723 TP