#### **SECTION S690 - PAVEMENT PATTERNING**

### S690-1 DESCRIPTION

Work consists of patterning of asphalt pavement as required in Contract Documents and as directed by Project Manager.

### S690-2 MATERIALS

### S690-2.01 General

Pattern, colors and materials to be used for patterning asphalt pavement will be as required in Contract Documents.

Individual components used to form completed system used to pattern asphalt pavement are to be congruous, supplied by same manufacturer, and designed to withstand AASHTO HS-20-44 Wheel Loading.

# S690-2.02 Inlay Thermoplastic Pavement Patterning

Inlay thermoplastic pavement patterning is to be used for imprinting or stamping decorative patterns into asphalt pavement.

Stamping template is to be 125 mils thick metal template, designed and constructed in required pattern, and must be created in machine shop using CNC or equivalent equipment to ensure quality and consistency of template shape and size.

Thermoplastic material is to be retro-reflective, provided in sheets with standard thickness of 90 mils, pre-cut by die or other pattern cutting machine into required pattern. Thermoplastic material is to consist of homogeneously mixed pigments, fillers, resins, fibers, and glass beads for retro-reflectivity. Pigments and fillers are to be uniformly dispersed in resin. Thermoplastic material is to be free from dirt and foreign objects.

Typical properties of thermoplastic material:

Characteristic	Test Specification	Minimum Results	
Water Absorption	ASTM D570	0.27%	
Binder Content	AASHTO T250	20.01% with d.o. beads	
Softening Point	ASTM D36	240°F	
Low Temperature Resistance @ 15°F	AASHTO T250	no visual cracks	
Specific Gravity	ASTM D792	2.00	
Indentation Resistance @ 110°F for 15 seconds	ASTM D2240 (after flaming)	43 (shore A)	
Impact Resistance	ASTM D256 Method A	4.9+ N-m	
Flash Point	ASTM D92	500°F	

# S690-2.03 Inlay Texturing Pavement Patterning

Inlay texturing pavement patterning system is to be used for imprinting or stamping decorative patterns into asphalt pavement, and then coating pattern with colored asphalt pavement coating material.

Stamping template is to be 3/8 inch thick metal template, manufactured from flexible woven wire rope cut, welded and pre-shaped into required pattern.

Coating material is to be designed for use with asphalt pavement, provide durable, long lasting color and texture of asphalt pavement, must be environmentally safe, and meet EPA requirements for Volatile Organic Compounds (VOC).

Minimum performance properties of coating material:

Characteristic	Test Specification	Minimum Results	
Durability: Taber Abrasion Resistance	ASTM D-4060 1 day cure, H-10 wheel: cycles (dry)	< 1.5 g/1000	
Water Sensitivity	ASTM D570 Water absorption after 9 days Remaining absorption after 1 hour of recovery	< 10% < 1.0%	
Color Stability	ASTM G-155 QUV 2,000 hours (CIE units)	brick color ΔE < 1.5	
Flexibility: Mandrel Bend	ASTM D522-93A Flexibility as measured by Mandrel bend	0.5mm thick sample passes 10 mm at 21°C 0.5mm thick sample passes 125 mm at -18°C	
Chemical Resistance	ASTM D-2486 Modified MEK scrubs 16 dry mils, number of scrubs until 50% substrate exposed	> 5000	
Adhesion to Asphalt	ASTM D-4541	substrate failure	
Friction - Wet	ASTM E-303 British Pendulum Tester	> 55	
Environmental Sensitivity	EPA 24 ASTM D3960-05 Volatile Organic Compounds	VOC < 150	

### S690-2.04 Overlay Thermoplastic Pavement Patterning

Overlay thermoplastic pavement patterning system is to be used for constructing decorative patterns on asphalt pavement surfaces.

Stamping template is to be 3/8 inch thick metal template, manufactured from flexible woven wire rope cut, welded and pre-shaped into required pattern.

Thermoplastic material is to be aggregate reinforced, retro-reflective, provided in sheets with standard thickness of 180 mils, and specifically designed to adhere to asphalt pavement surfaces. Thermoplastic material is to be highly durable, crack, fade, skid and slip resistant.

Post-stamping template is to be 1/4 inch thick metal template, manufactured from flexible woven wire rope cut, welded and pre-shaped into required pattern.

## S690-2.05 Overlay Thermoplastic Logo/Symbol Pavement Patterning and Bike Markings

Overlay thermoplastic logo/symbol pavement patterning and bike marking system is to be used for constructing decorative logos/symbols on asphalt or concrete pavement surfaces.

Thermoplastic material is to be aggregate reinforced, retro-reflective, provided in sheets with standard thickness of 180 mils, and specifically designed to adhere to asphalt or concrete pavement surfaces. Thermoplastic material is to be highly durable, crack, fade, skid and slip resistant.

# S690-2.06 Overlay Texturing Pavement Patterning

Overlay texturing pavement patterning system is to be used for constructing decorative patterns on asphalt pavement surfaces.

Overlay material is to be hot applied colored modified synthetic asphalt compound with standard thickness of 3/4 inch, and imprinted with template in required pattern. Asphalt compound is to be waterproof, consisting of graded sand and granite aggregates, and reinforced with two types of fibers.

# **S690-3 CONSTRUCTION DETAILS**

Preparation of pavement surface, equipment, materials, and method of application of patterning system, and repair of pavement texturing coating, will be as required by manufacturer.

#### S690-4 METHOD OF MEASUREMENT

### S690-4.01 Pavement Patterning

Quantity to be measured for payment will be number of square feet of patterning system constructed, and pavement texturing coating repaired.

## S690-4.02 Overlay Thermoplastic Logo/Symbol Pavement Patterning

Quantity to be measured for payment will be number of each logo/symbol constructed.

## S690-4.03 Overlay Thermoplastic Bike Markings

Quantity to be measured for payment will be number of each individual bike chevron, marking or symbol constructed. Bike markings will consist of bicycle arrow, bike chevron, bicycle symbol, bike symbol and bike yield markings.

#### S690-5 BASIS OF PAYMENT

# S690-5.01 General All Items

Unit price bid for all items includes cost of: preparation of pavement; laying out pattern; furnishing and installing pavement patterning system materials; repairing damaged or improperly installed pavement patterning system materials; protecting completed work from traffic; site cleanup; and furnishing all labor, material and equipment necessary to complete work.

Restoration of adjacent areas, and adjustment of all existing or new appurtenances will be paid for under separate bid items.

## S690-5.02 Repair Existing Pavement Patterning Coating

Unit price bid also includes cost of: removing damaged materials.

Payment will be made under:

ITEM	PAY UNIT
Inlay Thermoplastic Pavement Patterning	Square Foot
Inlay Texturing Pavement Patterning	Square Foot
Overlay Thermoplastic Pavement Patterning	Square Foot
Overlay Thermoplastic Logo/Symbol Pavement Patterning	Each
Overlay Texturing Pavement Patterning	Square Foot
Repair Existing Pavement Patterning Coating	Square Foot
Overlay Thermoplastic Bike Markings	Each
	Inlay Thermoplastic Pavement Patterning Inlay Texturing Pavement Patterning Overlay Thermoplastic Pavement Patterning Overlay Thermoplastic Logo/Symbol Pavement Patterning Overlay Texturing Pavement Patterning Repair Existing Pavement Patterning Coating

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