

## HIGH PERFORMANCE PAVEMENT TEXTURING SPECIFICATION

### PART 1 – GENERAL

#### 1.1 DESCRIPTION

- A. **StreetPrint**® is a proprietary asphalt pavement texturing system that is highly suitable for a wide variety of decorative pavement applications. Paved entranceways, parking lots, residential driveways, sidewalks, plazas, medians, and cross-walks are some examples of successful applications of **StreetPrint**®.
- B. The **StreetPrint**® system is executed by elevating the surface temperature of the asphalt pavement and then pressing a metal template into the asphalt pavement to replicate, in relief, the grout depressions common to hand-laid brick or cobblestone, or any other design as shown on the drawings or described in the specifications. The imprinted asphalt pavement surface is then coated using one or more of the **StreetBond** coatings.
- C. The proprietary nature of the **StreetBond** coatings and equipment combined with the dedicated focus on quality by the **Accredited StreetPrint Applicator** ensures the **StreetPrint**® Work is genuine; there is no other equal asphalt pavement texturing system on the market anywhere.
- D. **StreetBond** coatings are specifically formulated for application to asphalt pavement and have been confirmed by a certified testing facility to possess a balance of performance properties for a durable and color-fast finish.
- E. A variety of template designs and **StreetBond** coating colors are available. Please refer to [www.integratedpaving/streetprint.com](http://www.integratedpaving/streetprint.com) to view these. Custom template designs and colors are available upon request.
- F. Certain colors of the **StreetBond** coatings have been independently verified to have an SRI greater than 29 and therefore can help projects qualify for points in the LEED program under Heat Island Effect: Non-Roof. Please refer to [www.integratedpaving/streetprint.com](http://www.integratedpaving/streetprint.com) for further information.
- G. Qualifications. Only **Accredited StreetPrint**® applicators may bid for and perform this work. Please refer to **Section 1.4 DEFINITIONS**.
- H. **StreetPrint**® is a registered Trademark product. U.S. patent number 5,215,402.

#### 1.2 REFERENCES

- A. ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester.
- B. ASTM D-4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
- C. ASTM D-2697 Standard Test Method for Volume of Nonvolatile Matter in Clear or Pigmented Coatings.
- D. ASTM D522-93A Standard Test Method for Mandrel Bend Test of Attached Organic Coatings.

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- E. ASTM D1653 Standard test method for water vapor transmission or organic film coatings.
- F. ASTM G-154 QUV Accelerated Weathering Environment. Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
- G. ASTM D 2369 Weight Solids Standard test method for Volatile Content of Coatings.
- H. ASTM D 1475 Standard Test method for Density of Paint, Varnish, Lacquer, Other related products.
- I. ASTM D-2240 (2000) Standard Test Method for Rubber property – Durometer hardness.
- J. ASTM D-5895 Standard Test Method of drying or curing during film formation of organic coatings using mechanical recorders.
- K. ASTM D-570 Standard Test Method for water absorption of plastics.

### 1.3 DEFINITIONS

- A. “**Accredited StreetPrint® Applicator**” is a licensed **StreetPrint®** applicator who has a certificate of accreditation as offered by Integrated Paving Concepts, Inc. (Tel. 800-688-5652). **StreetPrint®** applicators are reviewed on an annual basis and certificates are valid only for the calendar year. All **Accredited StreetPrint® Applicators** have been qualified by Integrated Paving Concepts, Inc to perform the Work.
- B. “**Owner**” means the Owner and refers to the representative person who has decision making authority for the Work.
- C. “**Textured asphalt pavement**” is asphalt pavement that has been subjected to imprinting or stamping in a specific pattern.
- D. “**Non-textured asphalt pavement**” is asphalt pavement that is unstamped and is sometimes referred to as “flatwork”.
- E. The “**Work**” is the asphalt pavement texturing work contemplated in this bid submission and specification.
- F. “**Scuffing**” is a “tear” of the asphalt pavement caused by an external force. Stationary vehicle tires turning on the pavement surface is a typical cause.

### 1.4 SUBMITTALS

A copy of the current year Accreditation certificate as provided by Integrated Paving Concepts, Inc. to the **Accredited StreetPrint® Applicator** is a required submittal.

## PART 2 – PRODUCTS

### 2.1 MATERIALS – STREETBOND COATINGS

**Cem-Base 150** and **SP-150E** are **StreetBond** coatings which have been scientifically formulated to provide the optimal balance of performance properties

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for a durable, long lasting color and texture finish to asphalt pavement surfaces. Some of these key properties include wear and crack resistance, color retention, adhesion, minimal water absorption and increased friction properties.

**StreetBond** coatings are environmentally safe and meet EPA requirements for Volatile Organic Compounds (VOC).

- A. StreetBond CemBase 150** is a high-performance cementitious, epoxy modified, acrylic based, waterborne surfacing product designed for application on textured asphalt pavements only. **CemBase 150** fortifies asphalt pavement and as shown in Section 3.6 Table 3 of this specification, is used as a base coat for **StreetBond SP150E**. **CemBase 150** is not to be used on non-textured asphalt pavement.
- B. StreetBond SP150E** is an epoxy modified, acrylic, waterborne coating specifically designed for application on asphalt pavements. It has a balance of properties to ensure good adhesion and movement on flexible pavement, while providing good durability. **StreetBond SP150E** is durable in both dry and wet environments and can be directly applied to asphalt pavement or used as a top coat over **CemBase 150**.
- C. StreetBond Colorant** is a highly concentrated, high quality, UV stable pigment blend designed to add color to **StreetBond SP150E** and **CemBase 150** coatings. The same **StreetBond Colorant** shall be used in each coating layer applied to the pavement surface. One pint of colorant shall be used with one pail of **StreetBond** coating material.
- D. StreetBond Primer** is formulated to enhance the adhesion of **StreetBond** coatings to existing asphalt pavement surfaces (especially those with exposed polished stone aggregates) and/or previously coated asphalt pavements. The **Accredited StreetPrint® Applicator** can determine if **StreetBond Primer** is necessary or not for the application. **StreetBond Primer** is not required for new asphalt pavement.

### 2.1.1 Properties of StreetBond coatings

The following tables outline the physical and performance properties of the **StreetBond** coatings as determined by an independent testing laboratory.

**TABLE 1: Physical Properties of “StreetBond Water-borne coatings”**

Characteristic	Test Specification	Typical Requirement for Coating	
		CEMBase 150	SP150E
Solids by Volume	ASTM D-2697	60.27%	55%
Solids by Weight	ASTM D-2369	73.94%	68.9%
Density	ASTM D-1475	14.19 lbs/gal (1.70 kg/l)	13.34 lbs/gal (1.599 kg/l)

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**TABLE 2: Performance Properties of “StreetBond Water-borne Coatings”**

Characteristic	Test Specification	Typical Requirement for Coating	
		CEMBASE 150	SP150E
Dry time (To re-coat)	ASTM D-5895 23°C; 37% RH	45 min	35 min
Taber Wear Abrasion Wet H-10/ 1000g	ASTM D-4060 g/1000 cycles 7 days cure	6.92	3.4
QUV E Accel. Weathering environment.	ASTM G-154 Delta E 1,500 hours	9.16	0.53
Hydrophobicity Water absorption	ASTM D-570	10.2% (7 days immersion)	8.3% (9 days immersion)
Shore hardness	ASTM D-2240	33 Type D	63 Type D
Mandrel Bend	ASTM D522- 93A	3/8" @ 21°C	1/4" @ 21°C
Permeance	ASTM D1653	13.43g/m <sup>2</sup> /24hr/mm Hg (55mils)	3.45 g/m <sup>2</sup> /hr (52 mils)
Adhesion to Asphalt	ASTM D-4541	Substrate Failure	Substrate Failure
Friction Wet	ASTM E-303 British Pendulum Tester	WP* coated	64
		WP* uncoated	57
		AC** coated	73
		AC** uncoated	60

\*WP – test conducted on asphalt in wheel path

\*\*AC – test conducted on asphalt adjacent to curb.

Certificates of Analysis are available upon request for each of these properties.

### 2.2 EQUIPMENT

The following equipment is proprietary and is an integral part of the proper execution of the **StreetPrint®** process. This equipment is available only from Integrated Paving Concepts Inc. and can only be used by **Accredited StreetPrint® applicators** that have been properly trained to use this equipment. Substituting with other pavement re-heat and/or coating application equipment is expressly forbidden.

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- A. **StreetPrint® Templates** are used to imprint the desired pattern into the asphalt pavement. Templates are manufactured by cutting and welding highly specialized flexible wire rope into the patterns as detailed on the drawings. Templates are proprietary and only available from Integrated Paving Concepts Inc.
- B. Integrated Paving Concepts Inc. offers three mobile, proprietary pieces of equipment designed specifically to elevate the temperature of the asphalt pavement without adversely affecting it. Two of these, the **SR-120 and SR-60 Reciprocating Infra-Red Heaters (SR-120, SR-60)** each employ a bank of propane-fired heaters mounted on a track device such that these can reciprocate back and forth over a designated area thereby allowing the operator to monitor the temperature of the asphalt pavement at all times during the heating process. The nominal heat area of the **SR-120** is 130SF and the nominal heat area for the **SR-60** is 60SF.
- C. The third mobile re-heat device is the **SR-20 Infrared Heater (SR-20)**. The **SR-20** is designed specifically to heat areas such as borders and narrow areas that are inaccessible to the **SR-120** and **SR-60** heaters. Similar to the **SR-120 and SR-60**, the **SR-20** allows the operator to monitor the temperature of the asphalt pavement at all times during the heating process.
- D. The **Rapid Sprayer II** is a proprietary coating sprayer supplied by Integrated Paving Concepts Inc. and is capable of applying the **StreetBond** coatings to the asphalt pavement surface in a thin, controlled film which will optimize the drying and curing time of the coating.
- E. The **StreetHeat Portable Jet Heater** is a hand-held portable heating device to be used to heat isolated areas of the asphalt pavement.
- F. The **StreetBond Coatings mixer** is a motorized mixing device designed exclusively for use with **StreetBond coatings**.
- G. Two **finishing tools** are offered to enable the applicator to finish imprinting in areas that cannot be completed when using the templates (e.g. when imprinting next to a curb or wall). The **finishing bit** is a specialized metal bit designed to be attached to a power hammer device. Alternatively, the **hand-held finishing tool** may be used for this purpose as well.
- H. Vibratory Plate Compactors shall be used for pressing the wire templates into the heated asphalt to create the specified pattern. Please note that Integrated Paving Concepts Inc. does not supply Vibratory Plate Compactors.

## PART 3 - EXECUTION

### 3.1 GENERAL

The **StreetPrint®** system shall only be installed by an **Accredited StreetPrint® Applicator** in accordance with the plans and specifications, or as directed by the Owner. In any circumstance, do not begin installation without confirmation of Applicator certification.

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### 3.2 PRE-CONDITIONS

A highly stable asphalt pavement free of defects is a pre-requisite for the installation of the **StreetPrint**® system. **Do not install StreetPrint**® over poor quality asphalt pavement.

#### 3.2.1 Pre-requisites for new asphalt pavement

A durable and stable asphalt pavement mix design installed according to best practices over a properly prepared and stable substrate is a pre-requisite for all long-lasting asphalt pavement surfaces. The application of **StreetPrint**® does not change this requirement.

**Generally, the asphalt pavement mix design for roadways as prescribed by the local jurisdiction will be sufficient for the application of StreetPrint.**

#### 3.2.2 Pre-requisites for existing asphalt pavement

Depending upon the condition and age, existing asphalt pavement may or may not be suitable for the successful application of **StreetPrint**®. Minimally, the asphalt pavement must be not have any defects including cracks, ruts or potholes nor demonstrate any flushing, raveling or like deficiencies. The **Accredited StreetPrint**® **Applicator** can advise on the suitability of the asphalt pavement.

#### 3.2.3 Pavement Marking Removal: recommended guidelines

Pavement markings may be removed by sandblasting, water-blasting, grinding, or other approved mechanical methods. The removal methods should, to the fullest extent possible, cause no significant damage to the pavement surface. The Owner shall determine if the removal of the markings is satisfactory for the application of **StreetBond** coatings. Work shall not proceed until this approval is granted.

#### 3.2.4 Surface Preparation

The asphalt pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.

### 3.3 LAYOUT

Layout of the pattern for imprinting into the surface of the asphalt pavement shall be as per the drawings and specifications and in accordance to the methods prescribed by the **Accredited StreetPrint**® **applicator** in conjunction with the **Owner**.

### 3.4 HEATING THE ASPHALT PAVEMENT

The Applicator shall follow the latest Application Procedures as issued by Integrated Paving Concepts Inc. Primary heating of the asphalt pavement

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surface is accomplished by the **Accredited StreetPrint® applicator** using the **SR-120** or **SR-60** reciprocating heaters.

- A. Pavement temperature.** The optimal pavement temperature for imprinting the template is dependent upon mix design, modifiers used in the mix, and the age of the pavement. Typically, the surface temperature of the pavement should not exceed 325°F as determined by an infra-red thermometer reading taken after the **SR-120** or **SR-60** heaters pass over the pavement surface.
- B.** In order to achieve the proper depth of imprint it is important to elevate the asphalt pavement temperature to a minimum depth of 1/2 inch (12.5mm) without burning the pavement surface.

### 3.5 SURFACE IMPRINTING

Once the asphalt pavement has reached imprinting temperature, the templates shall be placed in position and pressed into the surface using vibratory plate compactors. The top of the template is to be flush with the surrounding asphalt pavement and can then be removed. Areas that have an imprint depth less than 3/8 inch shall be re-heated and re-stamped prior to applying the coatings.

In areas difficult to get at with the template, or areas that have light print, the **finishing bit** or hand held finishing tool may be used to complete the imprint process.

### 3.6 APPLICATION OF STREETBOND COATINGS

#### 3.6.1 StreetBond Coating System Options

The selection of the appropriate **StreetBond** coating or system of coatings and the required number of layers of each is dependent upon the application as outlined here in **TABLE 3**.

**TABLE 3: COATING SYSTEM OPTIONS**

APPLICATION	RECOMMENDED COATING SYSTEM FOR TEXTURED ASPHALT PAVEMENT
No vehicle traffic; Residential Driveway	1 layer of SP-150E over 2 layers Cem-Base 150 OR 3 layers of SP-150E
Vehicle traffic	<u>2</u> layers of SP-150E over 2 layers Cem-Base 150 OR 4 layers of SP-150E

**Notes:**

1. The **Accredited StreetPrint® Applicator** can make the final determination of the coating system option to be used for the project.
2. For high wear areas that will be prone to scuffing, use **Cem-base 150** overlain with **SP-150E**.

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3. Additional layers of **Cem-Base 150** or **SP-150E** may be used to provide additional build thickness in high wear areas such as wheel paths and vehicle turning areas.
4. A maintenance program may be required for applications exposed to:
  - scuffing
  - abrasive materials (such as salt and sand)
  - abrasive equipment (such as snow removal equipment)
5. Do not apply **Cem-Base 150** to non-textured asphalt pavement. Substitute with **SP-150E** to achieve recommended number of coating layers.

### 3.6.2 Coating Application Guidelines

- A. The **Accredited StreetPrint® Applicator** shall use the **Rapid Sprayer II** to apply the **StreetBond** coatings.
- B. The asphalt pavement surface shall be completely dry and thoroughly cleaned prior to application of the coatings.
- C. Subject to its age and condition, existing asphalt pavement may require **StreetBond primer**. The **Accredited StreetPrint® applicator** can assess if primer is required or not. Primer is not required for new asphalt pavement.
- D. The coating application shall proceed as soon as practical upon completion of the imprinting of the asphalt pavement.
- E. The first layer of coating shall be spray applied then broomed to work the coating material into the pavement surface. Subsequent applications shall be sprayed then broomed or rolled. Each application of coating material shall be allowed to dry to the touch before applying the next layer.
- F. The **Accredited StreetPrint® Applicator** shall apply the **StreetBond** coatings only when the air temperature is at least 50°F (10°C) and rising, and will not drop below 50°F (10°C) within 8 hours of a pplication of the coating material. There should be no precipitation expected within 2 hours after the final layer of **StreetBond SP150E** is dry to touch.

### 3.7 NON-TEXTURED HMA PAVEMENT

Only use **SP150E** and/or **StreetBond Primer** when applying **StreetBond** coatings to non-textured asphalt pavement. **CemBase 150** is designed only to be used for textured asphalt pavement.

### 3.8 COATING COVERAGE & THICKNESS

Recommended coating coverage and thickness is as outlined in **TABLE 4** below. Actual coverage may be affected by the texture of the asphalt pavement substrate and the imprint pattern selected. There will be less coverage with the first layer and higher coverage with subsequent layers.

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**TABLE 4: COATING COVERAGE AND THICKNESS**

# OF LAYERS	COVERAGE (approx.)		THICKNESS (approx.)			
	TEXTURED (Offset brick) SF/pail	NON- TEXTURED SF/pail	WET		DRY	
			mm	mil	mm	mil
3	200	225	0.65	25.7	0.36	14.1
4	150	175	0.87	34.3	0.48	18.9

### 3.9 OPENING TO TRAFFIC

Minimally, the surface coating must be 100% dry before traffic is permitted. The following table is a guide:

**TABLE 5: COATING DRY TIMES (TYPICAL)**

Air Temperature	Relative Humidity	Time to dry (approx.)
60°F (15°C)	80%	8 hours
81°F (27°C)	57%	4 hours
120°F (49°C)	5%	2 hours

Substrate temperature, wind and humidity can also affect dry times. Generally, warm and dry conditions decrease the time required for the coatings to dry.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 MEASUREMENT

The measured area is the actual area of asphalt pavement that has received the **StreetPrint®**, measured 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.

### 4.2 PAYMENT

Payment will be full compensation for all work completed as per conditions set out in the contract. For unit price contracts, the payment shall be calculated using the measured area as determined above.