StreetBond® Substrate Guide

Revised: June 2016

Content

Key substrate properties for StreetBond®

1. Stable base and sub-grade
2. Proper HMA mix design
3. Correct HMA installation

Assessing an existing asphalt substrate for StreetBond®

1. Age of asphalt
2. Finishing detail
3. Polishing
4. Surface texture
5. Rutting and shoving
6. Raveling and potholes
7. Bleeding and flushing
8. Utility Repairs
9. Surface contaminants
10. Settlement and cracking

Assessing an existing concrete cement substrate for StreetBond®

1. Age of concrete
2. Curing compounds
2. Surface contaminants
3. Spalling and laitance
4. Surface preparation

StreetBond® is only as good as the surface that it is placed on.

Key Substrate Properties

1. Stable Base and Sub-grade

A stable base and sub-grade underneath the HMA (Hot Mix Asphalt) surface are necessary for proper HMA pavement performance.

Sub-grade: Sub-grade is the layer of natural earth on which the pavement is built. Sub-grade needs to be removed to a stable layer that can be prepped and compacted. Proper moisture content is important for compaction; if the sub-grade is too moist, or too dry, it will not compact properly and can result in settlement issues. Settlement can cause cracking in the asphalt, aesthetically lowering the decorative value of StreetBond®.

Base: Base refers to the aggregates that are placed on top of the sub-grade to build the pavement to the correct height. Typically made up of crushed aggregates, this layer is graded and compacted to form the foundation for the asphalt layer. Thickness and compaction of the base course is important to avoid settlement.

2. Proper HMA Mix Design (for the intended use)

HMA is engineered / designed for specific use by modifying ingredients such as aggregate particle size and AC (asphalt cement) content and grade.

- The specific way HMA ingredients are combined may affect the stability, durability and workability of the pavement, HMA may be designed for specific uses ranging from driveways to highways. Each mix design has been developed for the best performance for the intended use. Since StreetBond® is a topical treatment for asphalt, it is extremely important that the appropriate mix designed for the intended traffic use is installed; otherwise, common asphalt issues like scuffing, shoving, and rutting can affect the StreetBond® coating.
- For example, if a smooth and sandy mix design, engineered for pedestrian use, is used in a traffic environment because a smooth StreetBond® finish is preferred, the mix may be unstable, causing the asphalt to rut, shove and/or scuff. This can affect StreetBond®.
- Always ensure a stable mix design, engineered for the intended traffic use, is used with StreetBond®.

3. Correct HMA installation

The proper installation of HMA is important because it can affect aesthetics and performance of the StreetBond® coating if it is installed incorrectly. The key installation factors that most affect StreetBond® are:

Compaction – HMA needs to be compacted at a specified temperature, using a specified weight. The appropriate temperature will vary with mix design. Generally, if an asphalt is compacted at too low of a temperature the AC is too tacky and resists compaction. If the temperature at compaction is too hot, the AC will shove during compaction. In the correct temperature range, the AC acts as a lubricant and allows all materials to compact together. If the asphalt is not properly compacted, it may not be stable and can cause adverse effects, such as scuffing/shoving/rutting, on the StreetBond® surface. Ensure that the HMA is compacted at the proper temperature using the proper compaction equipment.

Segregation – Segregation refers to an inconsistent surface texture of the asphalt, usually caused by large aggregates brought to the surface during hand work (raking). These areas can stand out more when coating is applied. Remove large aggregates from the surface when hand working the asphalt (rather than broadcasting them on top of the surface). This will produce a more consistent surface texture.

Finishing detail – The detail of workmanship around things like curbs, manhole covers and edges can affect how StreetBond® coatings look. Care should be taken to ensure that asphalt finishing into a curb or landscaping is done so in a clean, consistent way. Straight, clean and level finishing should be done with aesthetics in mind.

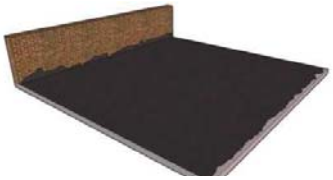
ATTENTION:

Generally, all new HMA projects (regardless of mix design) will produce black tire tracking between the new and old surface until the fresh asphalt cement has had time to fully cure. New asphalt tracks will be especially noticeable on lighter colored StreetBond® coatings. Please reference the "StreetBond® Care, Maintenance, and Repair Guide" for recommended cleaning options.

Assessing an Existing ASPHALT Substrate

1. **Age of Asphalt:** If the pavement is more than 5 years old, it may not be suitable to print. UV rays oxidize the AC found in asphalt. Those asphalts may be difficult to print and may inhibit adhesion of StreetBond® coatings. Asphalt pavement over 5 years in age should be carefully considered. Extra products and steps may be for StreetBond® installations on asphalt pavement older than 5 years.

2. **Finishing Detail:** If asphalt installation is sloppy around walls, edges, curbs and manholes, it will affect the aesthetics of the finished product.



3. **Polishing of Aggregates:** Polishing occurs when traffic volumes cause the aggregates in the asphalt to wear smooth or polish. Aggregate polishing may suggest that traffic volumes may be too great for StreetBond® Coating and that more layers or a different type of coating will be required. Use StreetBond® Adhesion Promoter Concentrate on polished surfaces before application of the StreetBond® coating.

4. **Surface Texture:** Patch repairs, segregation and raveling can all affect the finished look of StreetBond® coatings as they can create inconsistent textures in the surface. Surface texture may also affect coating coverage rates.

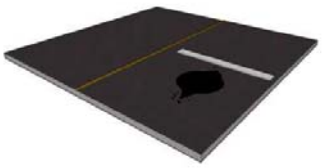
5. **Rutting and Shoving:** Rutting and Shoving is a depression or ripple of the pavement in the wheel path. It is a structural failure due to excessive loading of that pavement. Rutting and shoving is a sign of an unstable asphalt pavement experiencing plastic flow. The pavement's internal structure is not strong enough to bear the weight of vehicle tires.

6. **Raveling and Potholes:** Raveling is a loss of aggregate from the surface as a result of poor installation and/or lack of AC in the mix. It will appear as a different texture on the pavement surface. StreetBond® coating can reduce the amount of raveling and further degradation. Severe pavement fatigue cracking which results in a total loss of asphalt pavement in a localized area can create a pothole in the road. Asphalt will need to be replaced or refilled in the pothole.

7. **Bleeding / Flushing:** Consistent impact of vehicle tires on asphalt can cause heat and migration of excessive AC to the surface. If surface texture of asphalt becomes filled with liquid AC, it can create a weakened bond for the StreetBond® coatings.

8. **Utility Repairs:** Asphalt is often patched after repair of underground utilities. Most repairs are not installed to meet the asphalt stability requirements needed for their traffic conditions. This can lead to distortion and cracking of StreetBond® coatings along saw cuts. Ensure that utility repairs are carefully done with aesthetics and performance in mind.

9. **Surface Contaminants:** There are many types of surface contaminants that may affect the performance and aesthetics of StreetBond® coatings. Contaminants prevent the coatings from adhering to the asphalt, which can affect adhesion. The most common surface contaminants are:

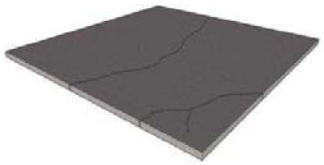


- ***Vehicle Fluids*** – Oil, fuel and grease can affect the bond of StreetBond® coatings to the asphalt. These contaminants need to be removed using an environmentally friendly degreaser and power washing. If the fluids have soaked in to the surface and cannot be washed away, then the pavement must be removed and replaced.

- ***Traffic Markings*** – Areas that have traffic markings should be avoided. Traffic markings like road paint and thermoplastic may remain visible through the coating and possibly cause adhesion issues. Removing traffic markings creates a different surface texture that will be noticeable after application of the StreetBond® coating.

- ***Asphalt Sealant*** – Asphalt surfaces treated with asphalt sealant should be avoided. By placing StreetBond® coatings on top of the sealant, the sealant must bond the StreetBond® coatings to the asphalt surface. If the sealant fails, the StreetBond® coatings will fail along with it.

10. **Settlement and Cracking:** Cracking occurs due to shrinkage of the sub-grade or asphalt pavement, or excessive bending of the pavement surface. Cracks need to be addressed before coating to avoid further water penetration.



Asphalt Surface Preparation:

Dirt, debris, water and contaminants sitting on the surface will affect adhesion. Thoroughly clean the surface using a broom and backpack blower or if dirt and debris is severe, a power washer.

Areas containing chemical contaminants such as vehicle fluids need to be treated using an environmentally friendly degreasing solution. Proper removal of contaminants and degreasing solution is required.

Care should be taken to ensure that the substrate is dry before applying the coating.

Assessing an Existing CONCRETE Substrate

1. **Age and RH of the Concrete:** Newly placed concrete is designed to develop its full design strength approximately in 28 days, at which time topical coatings can be applied. Coating application cannot be applied before the concrete has cured and proper preparations have taken place. RH of concrete should 75% or less.

2. **Surface Contaminants:** There are a variety of compounds which can penetrate into the concrete surface, including free form release agents, surface hardeners, greases, oils, food by-products, chemicals, chalking (carbonation), previously applied coatings or dust and dirt. If any of these contaminants are present they MUST be removed so that they do not impede the adhesion of StreetBond ®coatings to the concrete substrate.

3. **Surface Texture:** Concrete that has been troweled smooth may inhibit adhesion of the StreetBond ®coating. These surfaces must be etched with 10% muriatic acid solution and washed generously with water.After 28 days, shotblast with steel shot to International Concrete Repair Institute CSP 4 (assessed using ICRI rubber comparators - see below). The steel shot should be S-280 (0.028 in. (0.71 mm) or S-330, 0.033 in. (0.84 mm).

4. **Spalling and Laitance:** Laitance is a residue of weak and non- durable material consisting of cement, aggregate, fines, and impurities brought to the surface of wet concrete by overworking and over-manipulating concrete at the surface while finishing. Spalling occurs when this weak surface layer releases from the main body of concrete. The concrete must be repaired or re-poured before applying the StreetBond ®coating.

Concrete Surface Preparation:

All concrete surfaces must be clean and free of any dirt, oil, grease, soapy films, surface chemicals or other foreign contaminants. New concrete should be water-cured in lieu of using a curing compound. Any form of curing compound or release agent must be completely removed, along with any laitance. If concrete is badly spalled, restore surface to a reasonable condition using cementitious patching or resurfacing compound. New concrete that has been previously cured with a curing compound, or concrete that has smooth troweled, shall be cleaned and etched with 10% Muriatic Acid solution or media blasted. Wash with a biodegradable cleaner and follow with a generous rinse of clean water.

Prior to applying a StreetBond ®WB or QS Concrete Primer, all loose material, dirt and dust must be removed by using a power vacuum, stiff-bristled broom or compressed air. Existing stable concrete must be cleaned with a biodegradable chemical cleaner and water. Rinse thoroughly with fresh water to remove all traces of the chemical cleaner. If general cleaning is not adequate, then surfaces should be cleaned and etched as recommended for new concrete.

If surfaces are highly contaminated, or if surfaces are to be subjected to unusual service conditions, consult GAF Technical Services Department for recommendations at technicalquestions@gaf.com or call 800-766-3411.

StreetBond® Substrate Primer Guide

Type Substrate (Situation)	Product Needed			
	No Primer	StreetBond® Adhesion Promoter Concentrate	StreetBond® WB Concrete Primer (Water Based)	StreetBond® QS Concrete Primer (QuickSet)
Newly Installed Stable Asphalt	✓			
Stable Aged Polished Asphalt (Vehicle traffic has exposed and polished the high points of the aggregate)		✓		
New Concrete (With proper surface preparations)			✓	✓
Spalled Concrete (Spall repair may need to be address prior to priming)			✓	✓
Concrete Requiring Primer During Cool Weather Conditions (Cloudy, humid, night time applications)				✓
Exposed Aggregate Concrete (Concrete installed with exposed polished aggregate)			✓	✓

See Product Data Sheets at www.gaf.com for more information on these products and how they are applied. If your situation is unique and does not appear, contact GAF Technical Services at technicalquestions@gaf.com or call 800-766-3411.