

## **Resin Bonded Aggregate Surfacing**

**DESCRIPTION.** Under this work, the Contractor shall furnish and apply a resin bonded aggregate surface containing an epoxy binder binding aggregates together in accordance with patterns as specified on provided Work Orders or Plans, or as ordered by the Engineer and in conformance with these specifications. The locations are generally asphalt, or less often concrete, roadbed converted into pedestrian space or shared use space.

Resin bonded aggregate surfacing shall consist of:

- A two-part resin bonded treatment containing epoxy binder to bind aggregate together.
- Resin applied to the surface and loose aggregates are scattered onto the surface before the resin sets.
- For Pedestrian Space: An aggregate mix approved by Engineer for color and sharpness will contain three aggregate colors; Gray (RAL 7046), Truffle (RAL 1019), and Beige (RAL 1015) with these aggregate colors blended as 3 equal parts resulting in a gray-brown overall appearance unless colors or mix are custom specified by the Engineer for a site-specific application. Such custom mixes shall be included in the bid price for this item.
- For Shared Use Space Pilot Program: A custom color or mix requested by DOT for a site-specific application. Such custom mixes shall be included in the bid price for this item. The shared use space shall contain a friction aggregate that comprises no less than 25% of the overall aggregate blend. The friction aggregate shall have a minimum Mohs hardness value of 8.0 and shall include only calcined bauxite, corundum or alternate equal anti-skid aggregate approved by the Engineer. Such aggregate must be coated to match the custom color or custom color mix.
- The epoxy shall be covered with 1mm to 3mm sized aggregates.
- Incorporate aggregates approved by the manufacturer for compatibility and handling in compliance with manufacturer recommendations and be uniformly applied – providing a surface friction value >60 BPN (per ASTM E303) over the entire surface.

**MATERIALS.** The resin bonded aggregate surfacing shall be capable of application on new and existing asphalt and Portland cement concrete surfaces. New asphalt surface shall be cured for a minimum of 30 days prior to installation. The resin bonded aggregate surfacing product shall:

- Be VOC compliant and lead free.
- Not contain 0.1% or more of any chemical listed by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or regulated by the US Occupational Safety and Health Administration (OSHA) as a carcinogen.
- Conform to current Federal, State and Local air pollution regulations, including those for the control (emission) of volatile organic compounds (VOC).
- Be packaged and stored in accordance with the manufacturer's instructions and requirements for shelf life and storage conditions in original unopened containers. Shipping documents and containers shall have identification numbers or batch dates for confirmation of when products were manufactured, clearly labeled as to the type of material and the ratio of the components to be mixed by volume as well as showing resin or hardener components, brand name, name of manufacturer, lot or batch number, temperature range for storage, expiration date and the quantity contained. Include any special instructions regarding mixing and the Material Safety Data Sheets. This information shall be made available for inspection at any time.
- Follow the Federal, State and City environmental disposal regulations for unused resin bonded aggregate surfacing materials, tarps, tapes, and garbage.

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- Present a marking whose color and chemical resistance will not degrade under normal exposure to weather, street sweeping/plowing, calcium chloride, sodium chloride, automotive or food oil and automotive fuels.
- Use color pigments that remain stable under exposure to ultraviolet light, and if possible, have a positive rating on the LEED Solar Reflectance Index.

**APPROVED MATERIALS.** Products appearing on the list below with a Manufacturer's certification that the product meets the requirements of this specification, or a Product approved equal as determined by the Engineer, are deemed acceptable for use:

Safe-T- Grip by Epoplex  
1000 East Park Avenue, Maple Shade, NJ 08052  
800-822-6920  
[www.epoplex.com](http://www.epoplex.com)

Ruby Trek by Ruby Lake Glass, LLC  
493 State Route 28  
Richfield Springs, NY 13439  
607-435-8158  
[www.rubylakeglass.com](http://www.rubylakeglass.com)

Addastone by Chameleon Ways  
PO BOX 387  
Center Valley, PA 18034  
877-426-5687  
[www.chameleonways.com](http://www.chameleonways.com)

### **CONSTRUCTION DETAILS.**

**General.** The resin bonded aggregate surfacing shall be installed as shown on the Contract or Work Order Documents or as ordered by the Engineer.

Before any surface installation work is begun, a schedule of operations shall be submitted for the approval of the Engineer and his/her authorized representative. At least five (5) days prior to starting application, the Contractor shall provide the Engineer with materials samples showing the color mixture as specified and manufacturer's written instructions for use. These instructions shall include, but not be limited to, material mixing ratios and required temperature application range for pavement surface and air.

When applied under traffic, the Contractor shall provide all necessary flags, markers, signs, etc. in accordance with the MUTCD to maintain and protect traffic including pedestrians and bicyclists, and to protect marking operations and the markings until thoroughly set.

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, all tracking marks, spilled resin bonded material applied in unauthorized areas. Contractor shall be responsible for sweeping up and removing or vacuuming up all loose excess product from work zone within two hours of dry time.

**Atmospheric Conditions.** Resin bonded aggregate surfacing shall only be applied during conditions of dry weather and on dry pavement surfaces. At the time of installation, the pavement surface temperature and air temperature shall be within the range required by the material manufacturer.

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**Surface Preparation.** The Contractor shall clean the pavement and existing materials to the satisfaction of the Engineer. At the time of application, all pavement surfaces shall be free of pavement markings, oil, dirt, dust, grease, and similar foreign materials.

**Application Equipment.** Equipment for the placement of resin bonded materials shall be approved by the Engineer prior to the start of work.

**Application.** Resin bonded aggregate surfacing shall be placed at the friction, thickness, color and pattern designated by the Contract Documents or as determined by the Engineer. The installation shall not begin until applicable surface preparation work is completed and approved by the Engineer, and the atmospheric conditions and pavement surface temperature are acceptable to the Engineer.

Masking tape or similar should be removed as material gels, but before it cures and be properly disposed.

**Defective Results.** Resin bonded material, which after installation and curing is determined by the Engineer to be defective and not in conformance with this specification, shall be repaired. Repair of defective resin bonded installation shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer as follows:

1. Insufficient aggregate coverage and coefficient of friction:

Repair Method. Repair shall be made by reapplying the resin bonded over the cleaned surface in accordance with the requirements with 1mm to 3mm approved aggregates.

2. Uncured or discolored resin bonded material or insufficient bond (to pavement surface)

Repair Method. The defective location shall be completely removed and cleaned to the underlying pavement surface to the satisfaction of the Engineer.

After surface preparation work is complete, repair shall be made by reapplying epoxy, followed by colored aggregate in accordance with the requirements of this specification.

Other defects not noted above, but determined by the Engineer to need repair, shall be repaired, or replaced as directed by and to the satisfaction of the Engineer.

All work in conjunction with the repair or replacement of defective resin bonded installation shall be performed at the Contractor's expense.

**Personal Protective Equipment.** Follow all exposure, respiratory and personal protective equipment controls, handling and safety precautions and spill and disposal procedures as identified by the Material Safety Data Sheets (MSDS), labels and other manufacturer's recommendations for the products used.

**TEMPORARY TRAFFIC CONTROL (TTC).** The Contractor is responsible for ensuring appropriate TTC in compliance with the MUTCD appropriate for the dry time of the selected material applied. The Contractor is responsible to ensure adequate TTC to prevent those walking, skating, bicycling, and driving from coming into contact with applied material that is still capable of being tracked. The Contractor shall be liable for such tracking, property damage, and injury resulting from inadequate TCC practice should it occur.

**METHOD OF MEASUREMENT.** The quantity for payment, in square feet of resin bonded aggregate shall be computed within the payment lines shown on the plans, Work Order, or as otherwise ordered in writing by the Engineer.

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**BASIS OF PAYMENT.** The accepted quantities of resin bonded aggregate surfacing will be paid for at the contract unit price, which shall include the cost of furnishing all labor, materials, and equipment to satisfactorily complete the work. The cost for TTC during the marking operations shall be included in the price bid. The cost of removal of concrete curing compounds and existing pavement markings will be paid under the Water Blasting for Surface Preparation & Marking Removal item and is not included in this item.

*Payment will be made under:*

<b>Item</b>	<b>Pay Unit</b>
Resin Bonded Aggregate Surfacing	Square Feet