For a Durable Bridge Surface, Shot Blast

When a bridge is rebuilt, the top 2–5 inches of concrete deck must be removed through scarification. The removal process causes micro-fracturing of the concrete surface, resulting in a weak layer that can only be removed by the shotblast process.

That’s when ShotBlast, Inc. goes to work. We bombard the surface with steel shot (small steel balls) at a high velocity. This process removes contamination and micro-fractured concrete and creates a mechanical profile for other applied materials to bond to. Depending upon the concrete depth, we use varying grades of shot, from coarse to very fine.

Furthermore, we vary the intensity of the blast according to the desired topping or overlay. For instance, a brush blast simply breaks the glazed surface to create a rough texture for optimal adhesion of the coating, while the most aggressive blast abrades deeply, sometimes to a depth that leaves protruding coarse aggregate. When we are finished, we magnet-sweep the deck to remove all spent shot. Then we blow the deck down with high-powered blowers. And at last the deck is ready to be resurfaced.

Additional surface preparation references

Relevant information on surface preparation of concrete is available by referencing the following codes, standards, and guidelines.

SSPC-SP 13 Surface preparation of concrete.

ICRI International Concrete Repair Institute, Sterling, VA, 703.450.0116, www.icri.org.
Technical Guideline No. 03732, “Selecting and Specifying Concrete Surface Preparation for coatings and polymer overlays.” Includes visual standards to act as a guide in defining acceptable surface profiles for the application of industrial coating and polymer toppings.

ASTM D 4258 “Practice for surface cleaning concrete coating and polymer overlays.”

For a durable bridge surface…

Completed bridge project using Cargill Safelane Ice Prevention Overlay Route 15 South, Hepburnville, PA

In life we’re taught that what’s on the surface is not so important, it’s what’s inside that counts. But when you’re paving a bridge, superior surface preparation makes all the difference between a bridge that will need maintenance within months and one that endures for years.

After nearly 35 years of working with polymer and cementious flooring systems, ShotBlast, Inc. has perfected our concrete surface preparation techniques, especially when it comes to bridge surfaces. In fact, we’re one of the few contractors who can work effectively even with wet surfaces, using a special process for drying out the deck. And we’ve learned a few things that we’d like to share with our current and future customers.
Every bridge surface preparation job begins with **knowing the job specifications.** Then the **surface must be examined, and all unwanted debris must be removed** before the surface can be prepared.

**Job Specification and Surface Examination Checklist**

- Be sure the job specifications, the coatings or overlay specs, and the expectations of the architect and/or project engineer are in alignment.
- Specs should say how uniform, clean, rough, and what strength the concrete substrate should be prior to a coating or overlay installation.
- Proposals for surface preparation specs should clearly spell out cleaning methods, concrete surface profile of CSP 3 to CSP 9, and surface defect repair procedures.
- Before contracting for a job or awarding a project, check the current surface for existing sealers, curing materials, grease, oil, efflorescence, traffic lines, tar, and dirt, all of which need to be removed.

The International Concrete Repair Institute (ICRI) has created a technical guideline #03732, “Selecting and specifying concrete surface preparation for sealers, coatings, and polymer overlays.” This guideline provides concrete surface profiles of CSP 3 to 9 which are used under the following conditions.

- For coating applications from 4–5 mils in thickness, the surface profile shall be a CSP 3. This is known as a light shotblast.
- For coating applications from 15–50 mils in thickness, the surface profile shall be a CSP 4 or 5. This is known as a medium shotblast.
- For coating applications from 40 mils to $\frac{1}{8}$" in thickness, the surface profile shall be a CSP 5 or 6. This is known as a medium-heavy shotblast.
- For topping applications from $\frac{1}{4}$" to $\frac{1}{2}$", the surface profile shall be a CSP 6 or 7. This is known as a heavy shotblast.
- For concrete overlays greater than $\frac{1}{2}$", the surface profile shall be a CSP 8 or 9. This is known as an extreme shotblast.

*Industry test results indicate that this Concrete Surface Profile offers no improvement in adhesion with overlays, compared to that of CSP 7.*