



# Polishing Weak Concrete Surfaces

## CPC Position Statement #7

Most concrete surfaces are ideally suited for concrete polishing. When polishing a weak surface, however, three issues are likely to present themselves: 1) increased aggregate rollout; 2) lower gloss; and 3) reduced service life. Thus, expectations must be adjusted when polishing weak concrete surfaces.

A weak concrete surface may be caused by:

- A high water-cement ratio (w/c) concrete mixture;
- Water added to the surface during finishing;
- Bleed water finished into the surface;
- Exposure to freezing-and-thawing conditions;
- Carbonation due to unvented winter heaters; or
- Inadequate curing time.

In addition, Concrete Polishing Council (CPC) contractors have reported weak concrete surfaces when polishing concretes containing Type II cement (portland-limestone cement). The possibility of a weak surface should be considered if Type II cement is proposed in the concrete mixture. It may require additional time for the concrete to reach its intended strength.

ACI 310.1-20, "Specification for Polished Concrete Slab Finishes," requires identification of the surface condition using a Mohs Hardness test. This test evaluates the hardness of a concrete surface on a scale from 1 to 10. ACI 310.1, Section 1.8.3.3, states: "Prior to starting mockup installation, verify surface hardness with a Mohs Hardness testing kit." During jobsite placements, ACI 310.1, Section 3.1.1.1(e), requires the contractor to "Confirm that the Owner's testing agency results for Mohs Hardness test are in accordance with this Specification." Prior to polishing work, ACI 310.1, Section 3.1.4.1, requires that "Mohs Hardness measured on slab surface is greater than 4."

It is important to note that the mockup may not reflect the surface conditions on the full jobsite. Thus, when ACI 310.1 specifications are followed, both the mockup and jobsite placement must be evaluated for weak surfaces. If the Mohs Hardness is less than 4, indicating a weak surface, the CPC contractor must not begin work until unsatisfactory conditions are corrected in a manner complying with the contract documents or until a remediation plan is approved in writing by the designers or the owner's representative, or both.

A potential remediation effort can include the application of a densifier to increase the hardness of a concrete surface. However, because the effectiveness may be inversely affected by the initial hardness, the required amount of densifier will vary. Further, because densifiers increase hardness by reacting with calcium hydroxide available near the concrete surface, the effectiveness of the densifier will be limited by carbonation or pozzolanic reactions. Thus, it may not be possible to meet the hardness specification—changes to specifications and expectations may be necessary.

CPC polishing contractors will cooperate with owners, designers, construction managers, general contractors, and concrete contractors to discuss the effects of a weak concrete surface on polished concrete appearance. Slab surface finishing is the responsibility of other parties, and the difference in the polished surface appearance due to a weak concrete surface is not the responsibility of the polishing contractor. If you have questions, contact your CPC polishing contractor or the CPC Technical Hotline (888) 483-5288 or at [cpchotline@asconline.org](mailto:cpchotline@asconline.org).

