Looking Beyond Sound, Clean, and Dry

By Steven Turner

This article is not intended as a discussion in basic surface preparation. I am confident that most readers have either performed, witnessed, read about, or been lectured to on the subject. Rather, it looks at preparation in terms of field conditions, scheduling, and work flow. If you would like additional surface prep background information, an excellent list of references is included at the end of the article.

Surface preparation is a broad topic that, in a simplified form, requires surfaces to be sound and clean. Understanding the true meaning and weight these words carry is necessary for any successful repair application, in more ways than one. Successful preparation requires a defined and accepted interpretation of the specification and contract documents by the owner, engineer, contractor and his subcontractors, and any other contracted parties. Each individual or group must share a common vision of what successful preparation entails and what the outcome as a result of successful preparation should be. To proceed with the work without such an understanding will not necessarily render the project a disaster, but it can create conflict, warranty issues, delayed schedules, cost overruns, and a number of other headaches.

Consider a typical conventionally-reinforced, cantilevered balcony that is deteriorated because of corroded reinforcing steel and requires repair. Before proceeding with this article, quiz yourself. Take a couple of minutes and set up a scenario with which you are familiar. Think about or write down the steps you would take from beginning to end to remove the deteriorated concrete, replace it with new material, and protect it from similar deterioration in the future. Then progress from this elementary example toward something more complicated, to include crack routing and sealing, joint preparation and sealing, surface leveling, primers, sealers, coatings, embedded components, form work, curing agents, etc. Try to organize your steps in the order they should occur to facilitate other work items as well as productivity.

Now, let's take a closer look. In your scenario, did you consider:

- Work going on around and above the repair area. Is it dust-generating or will materials being used in other areas drip onto or settle within the patch or onto the surface to be coated or sealed?
- Temperature. A typical placement temperature to remember for most repair materials is 40° F (4° C) and above for a successive period of 48 hours or more. Above 40° there is no worry of frost formation at the substrate or material freezing.
- Temperatures that are too hot or rising can also be detrimental. Many coatings suggest installation in the afternoon or evening when temperatures are

falling as a means to reduce possible material outgassing.

- Inclement weather. Most contracts are performed optimistically. If the job were shut down whenever poor weather is predicted, work would proceed slowly. After rain, snow, humid, or other inclement weather, it is important to test the substrate for moisture content. Moisture meters or a simple mat test (See ASTM-D4263-83) can be used in certain scenarios as a guide toward reaching acceptable moisture levels prior to placing sealants, primers, coatings, epoxies etc. A good defensive plan to protect and treat work areas against inclement weather should also be considered.
- Timing. Fresh concrete must cure adequately prior to priming, sealing, coating, painting, and preparing joints and cracks for sealants. Most manufacturers require that fresh concrete cure for a minimum of 28 days or to a point where moisture-vapor transmission will not affect the material's performance characteristics prior to further material installation. Crack and joint primers are not always required by the manufacturer; however, when in use, their dry time prior to sealant application must be verified. Sealant cure times vary by type and application, as do deck primers, coatings, and epoxy leveling materials. Material selection requires that service requirements be considered and compatibility within multi-component systems verified. Integral components situated deep within the system must be prepared or cured appropriately before attempting to attach, bond, or install the next system segment.
- Where runoff materials may settle. Pressure washing is often used to prepare deck surfaces. Runoff generated during pressure-washing can contain a number of bond-breaking substances for concrete patching materials and coatings. As an example, power-washing a balcony deck causes runoff to drip down the face and sides of the balcony and into the drip edge. Failure to remove the runoff slurry from these hard-to-reach locations can cause coating failures.
- Curing methods. Wet burlap has long been an acceptable curing method for cementitious materials. However, if placed too early, it may adhere to the surface leaving a residue. If reusing burlap from a previous job, expect a slurry to remain on the deck surface that will have to be removed. Chemical curing agents are sometimes incompatible with coatings, and deck surfaces may require special preparation if used in conjunction with deck coatings.
- Work order. Deciding where to begin and finish work plays a major role in the "flow" of work. If we consider a typical balcony tier, it is important to scrutinize the critical path work items and how they will drive the schedule. A clear perspective will help to eliminate rework and reprep when it comes time to place materials and will maximize material use and reduce equipment handling.

Prepping a surface to be "sound, clean, and dry" as specified in many contract documents requires planning. Contracted parties have to educate themselves and be knowledgeable of material characteristics, performance traits and compatibility issues, and must agree upon work standards. In addition, the flow of work should be organized in a manner that does not adversely affect or alter critical path work items. Finally, careful monitoring and supervision during material installation should be available in the field at all times.

References:

ICRI Guideline 03730 - *Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion*, ICRI, 1995.

Concrete Repair and Maintenance Illustrated, Peter Emmons, 1994.

Sound, Clean and Dry, Ray M. Reed, 1993, The Aberdeen Group.

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