

New Methods for Concrete Corrections

By Poinsettia Byrd

No matter how good we get at placing concrete, there will always be a need for concrete repair. Most of you have seen spalled tops or failing slurry caps, lippage or curled joints, bad floor flatness (FF) numbers, floors that need to be profiled for overlays, floors that have failed coatings, and floors that need to be cleaned up or polished. In some cases, the owner might want to take a failed top and turn it into a sound floor, exposing the aggregate and grinding it smooth or to a polished finish. In each of these cases, a variety of equipment, tools, and methods are used to make the repairs.

What follows are a few methods that are being used today to reduce cost and increase production, all with higher precision. They will help achieve a more controlled repair.

Repairing a Spalled Floor or Failing Slurry Cap

Preparing this floor for an overlay using the latest equipment in today's market would start with a concrete shaving machine. This machine is very different from a scarifier or shot blaster. It typically contains 40 to 50 diamond blades and can shave 1/8 in. (0.32 cm) of concrete at a rate of 800 to 1000 ft² (74 to 93 m²) per hour. This machine can cut up to as much as 1/2 in. (1.3 cm) in one pass. It has been recommended by the manufacturer, however, that the material be removed 1/8 in. (0.32 cm) at a time.



Concrete shaver cutting grooves in Manhattan sidewalk

This ensures a precise cut and extends the life of the blades, along with causing less abuse to the machine. Using this machine in this method allows control of the cutting depth and the amount of material removed in a controlled format. Other methods can be effective for removable but could loosen aggregates that are soundly attached, which can cause an erratic surface and micro-fractures. This can result in a closer inspection of the floor before placing the overlay and possibly the cost of using more overlay material.

Removing Lippage or Curled Joints

The concrete shaver and some concrete grinders can be used to remove the lippage or curled joints. If the lippage is severe, the best and fastest choice is to use the concrete shaver. It allows control of the cutting depth to a point where typically all that remains is to finish the surface off by a single clean-up grinding step. For the grinding step, an assortment of machines can be used, with the choice typically determined by the square footage being repaired. For example, if there are only a few feet to repair, a hand-held grinder with a segmented diamond cup wheel will work best. For larger areas, the old method was to use the same hand-held grinder and diamond cup wheel, but now there is a large variety of walk-behind machines that can be used to reduce the labor costs and increase production. Available are stand-up edge grinders, variable-speed single-head grinders, planetary grinders, and counter rotating grinders.

Profiling a Sound Floor for a Coating

Some of the methods used to profile floors include scarifying, shot blasting, diamond grinding, and sanding. The type of machine used depends on the specification that is written for that job and the type of coating to be placed. An alternative to these machines is a dry diamond grind, which is often used in projects for coatings of thinner natures. This method has been said to bond the coatings to the floor with a cork-screw effect. It allows control when cutting the floor and provides a texture on the surface that can reduce the amount of coating used in the process. It is fast and does not leave behind

the risk of leftover shot or micro-fractures, both can cause a coating to fail. Grinding can leave behind dust, however, so the professional coatings applicator should ensure the floor is clean, dust-free, and sound before applying the coating.

Improving the Floor Flatness Numbers

Even the best laid and finished floors can have FF numbers that did not meet the specifications and must be fixed. The older methods were to scarify and grind, or just grind out the high spots. There is nothing wrong with using these methods, but labor can be costly, and these methods can sometimes leave an inconsistent floor. An alternate method is to use the concrete shaver to resolve this problem. The cutting depth is set, and the entire floor is shaved to this level. Then the entire surface is ground using a coarse diamond on a concrete diamond grinding machine.

Coatings Removal

There are many methods in the industry to remove coating and most are effective. Shot blasting, scarifying, diamond grinding, or chemically removing old coatings or failing coatings are all typical removal methods. The proper removal tool mainly depends on the type and the thickness of the coating to be removed. Some of the newer methods are the use of diamond grinders and specialty tools. These diamond tools have been designed with the toughest coatings in mind. Used in combination with a grinding machine designed for this rigorous task, the job can go very fast. These tools actually slice small pieces of the coating off at a very high rate, which reduces the resistance on the machine and allows for maximum cutting pressure.

Exposing Aggregate to Seal, Densify, or Polish

This has long been a dreaded process due to the length of time involved and the expense to the owner. The most common method used today is the diamond grinding process, which takes many passes to accomplish. The concrete shavers have significantly reduced the amount of time needed to expose the aggregate in the concrete slab. With one pass of the concrete shaver and a pass with a 32 in. (81 cm) diamond grinder, approximately 700 ft² (65 m²) per hour of aggregate exposure can be achieved. This can be much faster than the older methods, which typically only produced 100 to 150 ft² (9 to 14 m²) per hour.

By stepping up to the latest equipment and tools, a contractor can reduce operating costs, control with precision, and increase production.

This Viewpoint article has been selected by the editors as an offering to the interest of our readers. However, the opinions given are not necessarily those of the International Concrete Repair Institute or of the editors of this magazine. Reader comment is invited.



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Coatings removal using a floor grinder



First step of the concrete polishing process



Edging machine that grinds and polishes to make the entire floor uniform