



Vertical Concrete Polishing Inc.

Patents Pending
INTERNATIONAL & DOMESTIC
Vertical Concrete Polishing Inc.

Innovation in Vertical Concrete Polishing

New design opportunities are created

Although it's possible to produce a polished vertical concrete surface using handheld grinders, these finishes can be uneven if large areas must be polished. So until now, designers who wanted their projects to include large expanses of polished concrete walls have been limited to using plant-cast and site-cast precast concrete pieces that were polished before they were erected. Unfortunately, when large panels are required, the risk of stress cracking looms large.

The designers of Faena House, an 18-story condominium complex in Miami Beach, FL, called for 40,000 ft² (3700 m²) of polished, cast-in-place structural concrete walls in the building. But after estimates showed that the laborious process of hand polishing would have taken more than 2 years, the owners of the complex sought a different solution.

They contacted Mark Richardson, an inventor with a flooring background, at his machine shop in Carrollton, GA, and presented him with the problem of polishing 40,000 ft² of 30 ft (9 m) tall walls. Five weeks later, Richardson drove his prototype solution—an automated machine that can grind and polish vertical surfaces—to the jobsite, and he polished a test

area of 50 ft² (4.5 m²) to a brilliant glasslike 1500 finish in 8 hours. A test area of that size would take a week to complete with hand grinders. This led to a signed contract within days. Richardson and his Project Manager Patrick Durkin, who has a construction background, went back to Georgia and built six improved polishing machines.

Overcoming Jobsite Challenges

When they started the job in February of 2014, the polishing team faced multiple challenges. The walls that the concrete contractor had placed were cured and ready to be polished, but when the forms were stripped, the surfaces were far from uniform; some were severely bowed from forms that had flexed. Richardson returned to his shop and built a new machine that removed a lot of material quickly but was gentle enough to not gouge or scar the wall. It was just aggressive enough to cut the wall true and plumb to provide a polishable surface.

Another obstacle was the problem of ledges that were left in the walls from forms that shifted during the concrete placement. Some of the ledges had to be ground flat and then blended in with the rest of the wall, sometimes 10 to 12 ft (3 to 3.6 m) in all directions. Design elements also posed challenges. There were rows of columns to be polished, and some of the columns were only 8 in. (200 mm) apart. A thinner apparatus was designed to fit in between the closely spaced columns. Other customizations were needed to accommodate curved walls and inside corners, so the equipment was changed and upgraded throughout the project as needed.

On site, the workers came up with ideas to make the job easier, and Durkin found ways to increase production. At first, two workers were required to operate a machine. After some automation was added, the equipment was able to move horizontally and vertically on its own, and so only one



Examples of the surface imperfections in the walls

Products & Practice *Spotlight*



Polished structural elements at Faena House, Miami Beach, FL



operator was needed. Durkin communicated each day on the phone with Richardson, who would then take the information and create new prototypes in Georgia. Those were shipped and tested in the field and Durkin would make minor adjustments, if necessary. With teamwork, Richardson and Durkin were able to balance production and the development of new equipment as needed to adapt to each changing phase of the project. “Amazingly, most of the ideas worked very well, held up throughout the project, and are still being utilized today,” Richardson says.

A Polishing Option

With perseverance and a 6-day-per-week work schedule, the job was completed in 1 year (on schedule) with a crew of only 10. “The machines are so easy to operate that I did not need to hire employees with polishing or even concrete experience. The average worker was able to be trained and put in charge of polishing walls in as little as a few days. All you

need is a little common sense,” Durkin explains.

Richardson and Durkin are now business partners in Vertical Concrete Polishing, Inc., which works both domestically and internationally to fill the need for large, cast-in-place, polished concrete walls. Although the patent-pending vertical polishing equipment is not being sold at this time, the company leases equipment that’s designed specifically for each project. They provide a project strategy and come to the jobsite to train the crew to run the equipment efficiently—a more affordable option for someone wanting this very modern finish or a new branch of services to offer.

For the work at Faena House, the company was presented the 2015 Hanley Wood Innovation Award for Polished Concrete at World of Concrete 2016.

—Vertical Concrete Polishing, Inc.

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Selected for reader interest by the editors.