CONCRETE FLOOR AND WALL SYSTEMS

Protection From the Bottom to the Top

PHOTO: COURTESY OF THE AUTHOR

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Concrete surfaces in food and beverage manufacturing facilities have specific demands that require certain protections when it comes to coatings. In addition to protection from deterioration, surfaces in these facilities also need to be resistant to bacteria and cleaning chemicals, and meet certain FDA and USDA standards for food and beverage service. And because these are often heavily trafficked surfaces, slip resistance is another critical property for coating systems to exhibit.

Owners of one U.S. food and beverage manufacturing facility decided to refurbish a large oven room in one of their facilities. The existing oven room floors had areas where water was ponding against the legs of the ovens and out into the sloped surfaces from the original installation. The facility owners needed to replace one of the ovens and permanently remove three others, and the existing tile walls and brick floors were considered hygienic risks for their process.

The project began with demolition of tile and brick surfaces from the floors and walls of the oven room.

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To protect the refinished oven room's concrete walls and floors, the owners decided to install new high-performance coating systems instead of new tiling. This article recaps the oven room refurbishment project from original demolition to completion.

Project Sequence

This project began with the demolition of tile and brick substrates from both the walls and floors in the oven room to ready the room for new resinous flooring and high-performance wall coatings.

After the demolition, the existing wall substrates required grinding to remove all the existing tile adhesive/mortar and for preparation of the substrate, completed to a CSP 2-3 standard level. When the wall preparation was complete, all the vertical surfaces were then skim-coated with a thixotropic

From left: **After tiles were removed, walls were prepared to a CSP 2-3 standard before primer and coating application. Floors received a repair mortar before shot blasting and application of a new high-performance floor coating system.**

epoxy to fill in imperfections such as bug holes, gouges and cracks. The epoxy skim coat was allowed to cure overnight before prepping by sanding and minor grinding was done to smooth out the walls prior to priming.

The walls were then primed with an epoxy coating at 3-5 mils DFT. Once cured, the walls were then patched again and sanded prior to application of a high-performance water-based epoxy coating at 8-10 mils WFT. Once cured, the coating was sanded and solvent-wiped prior to the application of a final urethane topcoat at 3-5 mils WFT.

After the floors were demolished, areas had to be poured with a repair mortar to reslope the surface prior to installation of a new hygienic, chemical- and slip-resistant urethane floor coating system. The areas that had new concrete were shot blasted with steel shot to a CSP 5-6 surface profile and the areas of existing coatings were bush-hammered to a CSP 6-7 standard prior to applying the new ¼-inch urethane slurry system. The floor coating was installed by rake and trowel to a ¼-inch thickness and broadcasted using 20/40 mesh aggregate. Crews then troweled in 6-inch integral cove base with a 2-inch radius. After the cove base was finished the floor received a grout and final application of a two-component polyaspartic topcoat, in a steel gray color, with added aluminum oxide into the final topcoat for non-slip characteristics.

Environmental conditions were monitored and measured throughout the duration of the project. Meters were used to measure substrate moisture, substrate temperatures and ambient temperatures to ensure that proper conditions were in place.

Final inspection was performed once the coatings had time to fully cure. Walls had to be smooth and seamless for ease of cleaning and durability. Floors had to have

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appropriate texture to prevent slip and falls, and the sloping was extremely important to ensure that water would shed to the drains appropriately. Drain details and terminations needed to be keyed into the flooring to finish flush to the drain to ensure no harborage points for water or bacteria.

Project Challenges

With the amount of demolition necessary, safety was a constant consideration during the project. Measures were constantly taken to ensure that crews were working safely and using the appropriate PPE, including respirators, safety glasses, face shields and cut resistant gloves, to perform the work without injury.

In addition, work was being conducted in a very active food and beverage manufacturing facility. There were rooms on three sides of the work area that were actively producing products. All of the work

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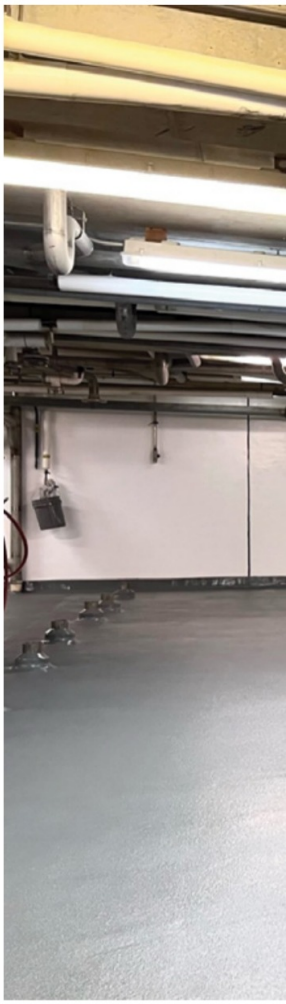

Contractor crews used coordination and planning to overcome early scheduling issues to finish the project on time.

processes had to be contained within the workspace to prevent potential contamination. All of the equipment coming in had to be cleaned and wrapped in plastic before delivery to the site and had to leave the building the same way. The ovens had to be removed, oven legs needed to be saw cut out of the floors, new ones set and all the mechanicals had to come off the walls prior to the start.

Another major challenge was that crews were only able to remove the floor and wall debris out of the plant through a standard man door. They had no access for large dump carts due to potential contamination in the plant. All project debris had to be taken out using small electric wheelbarrows to a dumpster 50 yards from the work site. This created the need for additional manpower and specialized equipment to haul out the waste.

There were multiple contractors that the coating contractor had to coordinate with before their work could start. Unfortunately, crews had to start the job three days later than originally scheduled – with the same end date.

Project Completion

In all, planning proved to be the key to getting the project completed on time. During time-critical shutdowns, it is imperative that all parties are involved in the planning

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stages and that the schedule and expectations are conveyed to the crew. By having the entire team on the same page and involved in the day-to-day communications, work was completed efficiently and daily goals that were needed to meet the overall demands of the project were ultimately met.

It was a tight schedule to begin with, and having to start three days behind schedule was a tall order. The crews rallied and pushed through, working long hours and picking up extra days on the weekends, especially during the demolition. It was not easy work, and they stayed at it to complete the project on time. JPCL

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ABOUT THE AUTHOR

Kevin Kipp is an Estimator, Project Manager and Co-Owner of Hardig Industrial Services, an industrial coatings contracting company based in Cleves, Ohio. He has 20 years of experience in the coatings industry, previously holding various sales positions with Sherwin-Williams and Carboline. He is a NACE-certified Coating Inspector and an SSPC-certified Concrete Coatings Inspector and holds a degree in marketing/accounting from the University of Cincinnati.