Case History


Courtesy of Coatings Unlimited, Inc.

Lining Secondary Containment: It's in the Details

Sometimes it's the details that make the big things work—such as grinding key-in termination details all around a new secondary containment pad and applying the lining in the evening to mitigate outgassing from the new concrete.

These practices played an important role the success of a lining project on a newly constructed secondary containment area at a tank farm that holds fuel for a Midwest cement company, said Steve Philipp Jr., project manager for the lining work. The 6,500-square foot job was completed in three weeks this past June. The proprietary fuel, an alternative to what the company typically used, has a different range of aggressive chemical properties than the usual fuel.

The containment was designed and built to hold the fuel in the event of a leak or spill from the storage tanks on site. The design called for protecting the concrete floor slab, the tank foundations, pump pedestals, and containment walls with a lining impervious to the fuel.

The coatings distributor wrote the specification for the job, assisted the owner in the contractor selection process, and inspected the work at various stages, including the final inspection, on behalf of the cement plant, said Larry LeSeure, owner of the distributor company. The 100% solids system specified included a moisture-cure epoxy primer, an epoxy novolac topcoat, an epoxy mortar for voids in the concrete, and aggregate for slip resistance, according to the coating manufacturer.

Philipp's three-man crew used coal slag to abrasive blast clean the vertical and horizontal surfaces of the containment in accordance with SSPC-SP 13/Nace. No. 6, "Surface Preparation of Concrete." Abrasive blasting removed laitance and brought the surfaces in conformity with the International Concrete Repair Institute comparative standard specified for the job. The spent abrasive and debris were collected by industrial vacuum.

The crew used diamond grinders for the many edges and corners of the structure and for key-in termination details, notching the perimeter to prevent lifting of the coating or hard edges. Surface preparation, especially the termination details, took the most time on the project, said Philipp.

All application work was done in the evening, he noted, to mitigate any coating problems caused by outgassing from the concrete. Application was done in accordance with SSPC-Guide 11, "Guide for Coating Concrete," he added.

The primer was specified at a dry film thickness (dft) of 10 mils for vertical and horizontal surfaces. Wearing half-mask organic vapor cartridge respirators and protective clothing, the crew combined primer components using a pneumatic paint mixer, and they hand-rolled the coating, Philipp explained. Next, workers hand-troweled the epoxy mortar to fill bugholes and other voids, creating a smooth surface for the remainder of the system.

The crew also used the pneumatic mixer to prepare the epoxy novolac topcoat. They added a thixotropic agent to the material that would be applied to vertical surfaces. The thixotropic additive prevented runs and sags on the vertical surfaces. The topcoat was hand-rolled on the vertical surfaces to a dft of 15 mils, said Philipp.

On horizontal surfaces, the crew applied the topcat to a dft of 30 mils. To provide a durable, slip-resistant, and impact-resistant surface, the crew used an aggregate blower to broadcast (to rejection) 24-40 mesh aggregate into the topcoat while it was still wet. When the coating was dry the next day, workers swept and removed the excess aggregate. A 15-mil (dft) layer of the epoxy novolac topcoat was then applied over the horizontal surfaces to finish the job.

Coatings Unlimited, Inc., an SSPC-QP 1 and QP 2-certified contractor (St. Louis, MO), performed all surface preparation and coating work. Blome International (O'Fallon, MO) manufactured the coatings. The coating distributor was Corrosion Protection Services, Inc. (Sunset Hills, MO).

■