

## Marine Home Makeover

By Stephanie Marie Chizik



Imagine living in a home where the very walls you depend on are harming your skin, your health, and, therefore, your very existence. For some marine animals at the Monterey Bay Aquarium in California, this was their daily existence. Because of the extreme deterioration of the crystalline-capillary coating of the one-million-gallon (3,785,411.8L) medical tank and open sea exhibit reservoir, animals that came in contact with the rough surface were in danger of cutting their skin. Therefore, instead of keeping them safe, this 2,500 square foot (232.3m<sup>2</sup>) home was causing some animals pain.

For an aquarium, where the safety of the animals is the number one priority, this deterioration was a serious problem. The aquarium reached out to the contracting community for help, and after a thorough bidding and review process, the Advanced Polyurea (AP) team was chosen to fix the rooftop tank. With other rehabilitation stages going on simultaneously, this had the potential to be a whale of a job. Not only did the aquarium need to relocate some of the animals as well as update their human and animal evacuation processes, but the AP team also had a few currents of their own to swim against.

First, AP needed to find a safe place for their trailer. They decided to park it and a guard in front of the building. There it would be in a well-trafficked area near the safety of street lights. As it turned out, the street lights helped with another problem: How to reach the hoses to the tank. Located on the facility's roof, the marine tank gave the AP team the challenge of finding a way to access their work site. The solution was anything but boring: The AP team gained city permits to use the street lights as makeshift booms, allowing their hoses to reach straight up and over the top of the building. So, although their trailer and equipment were parked in the front near the patrons, using the lights got the hoses out of the way and avoided any potential damage that a busy jobsite work area could have caused.



Logistical problems solved, the AP team was ready to work. To prepare the surface, they removed the old coating and disintegrating concrete with a mechanical etching machine equipped with grinding wheels. An abrasive blast brought the surface of the tank down to the desired concrete profile. They allowed it to dry completely before testing the vapor outgassing levels with ASTM D4264 concrete moisture meters. They adhered the square visqueen sheets over the concrete, which helped to ensure that no additional moisture was seeping out of the concrete and, therefore, that the coatings would properly adhere. Although most marine tanks need to be kept full of water, this tank needed anything but that.

With the concrete dry, the team proceeded to fill any of the damaged or uneven areas with polymer modified cement. This evened out the surface and got it ready for the primer. For the best chance of success, the AP team decided to prime in the evenings when the concrete was at its coolest temperatures and, therefore, most likely to absorb the primer. They applied three coats of Polyprime-100 by Specialty Products, Inc. (SPI) to help further discourage moisture migration in the concrete. These extra steps, in addition to taking proper safety precautions—using a human barrier around the spray area, retaining a third-party safety coordinator on site, and wearing Tyvek suits and 3M organic vapor cartridge respirators—kept the AP team afloat.

They rolled on each of the three layers of primer over the course of a day and a half while working around the animals' schedules for safety (particularly the nearby sea otters). Finally the tank was prepped and primed. The AP team then used a Gama G20H hydraulic proportioner to spray-



apply SPI's Polysield HT polyurea in an average thickness of 90 mils (2,286 microns). For the majority of the surface, they used a Graco fusion air purge spray gun, but for detail work, they used Pentech Inc.'s mechanical purge Palm Gun. Naturally, the aquarium chose to have the marine tank coated in the color Diego Blue.

After 56 hours, the polyurea was dry. Once the other construction companies finished their tank projects, the animals were brought back into their newly improved home. After one year, the AP team returned to inspect the success of their polyurea coating; they found that the tank was not only standing up to the water pressure but also to the standards of the Monterey Bay Aquarium's marine animals and crew. It was such a success that the AP team has since been asked to return for six additional projects! The next project to come down the chute: sea otters. Otters, puffins, and turtles. Oh my!

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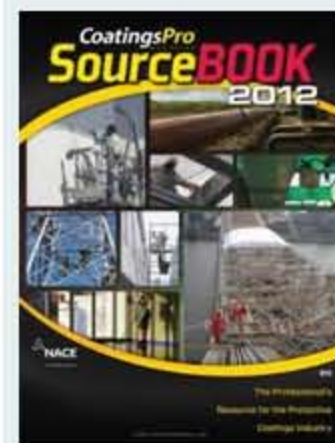
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