

The image shows the interior of a large, cylindrical water tank. The walls are a light, yellowish-tan color. A complex network of metal scaffolding is erected against the wall, reaching up towards the ceiling. The ceiling consists of a grid of white, rectangular panels. A vertical yellow pipe runs down the center of the tank. The overall scene is one of active construction or renovation.

# Dehumidification Equipment Aids Water Tank Rehabilitation

## **CASE STUDY INSIDE**

**Alpine Painting & Sandblasting Contractors and DRYCO team up to successfully complete the rapid turnaround of a tank-painting project.**

# Dehumidification Equipment Aids Water Tank Rehabilitation

When Long Island American Water Corporation targeted its 2.5-million-gallon water tank for maintenance, the owner scheduled the work over the winter and spring months so that the tank could be put back into service by May 1, 2005, says Rich Kern, PE, project engineer for the company. Working in the cold, wet winter months necessitated the use of dehumidification equipment, as well as heating equipment, to keep relative humidity levels and steel temperatures suitable for surface preparation and coating operations, says Sam Scaturro, operations manager for Alpine Painting and Sandblasting Contractors.

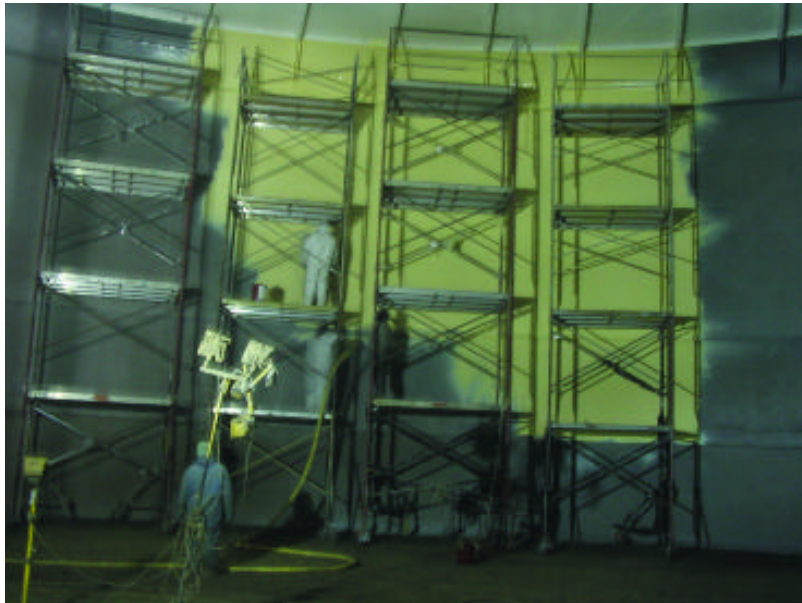
The scope of the six-month project required abrasive blasting of the ground storage tank's interior and the application of two different coatings. A single-coat, 100% solids polyurethane coating was chosen for the shell walls, columns, and floor of the tank. The polyurethane's durability, zero volatile organic compound content, and low temperature curing were factors in its selection, says Kern. A high-solids epoxy, applied in a stripe coat followed by a full coat, was selected for the tank's ceiling, which features a multitude of structural steel elements that would be difficult to coat with the polyurethane product, says Scaturro. In addition to the interior work, the project included the overcoat-

ing of the exterior roof of the tank. Other improvements included security upgrades and hatch and railing replacement, says Kern.

## Dehumidification Plays Important Role

As a rule, Scaturro says, his company prefers to use remotely monitored dehumidification equipment on its projects

because of the potentially costly outcome—rusting of cleaned steel or problems with coating cure—should a malfunction cause the equipment to shut down. On this project, the contractor ran 8,000 cfms of dehumidification, set up with a 5,000-cfm unit and a 3,000-cfm unit. Two units were chosen so that the contractor could be assured that relative humidity levels would not be greatly affected in the tank if one of the units shut



Lining application underway in the dry tank  
Photos courtesy of Alpine Painting and Sandblasting Contractors

down. The contractor wanted to keep relative humidity in the tank under 25%. The equipment actually achieved levels between 5% and 6%, says Scaturro.

The dehumidification company monitored its equipment via a hook up to a computer monitoring station at a remote site, says Scaturro. Sensors located in the dehumidifier would signal a control monitor, also found in the equipment, in the event of a problem. The control monitor would then transmit a signal via a cellular device in the form of a text message to a company employee's pager. Subsequently, the



Tank nearing completion and return to service



employee could correct certain problems from the computer monitoring station. If on-site repairs were necessary, the remote monitoring system would be triggered, and personnel could be on site within 4 to 6 hours, he says, in enough time to avoid compromising blast quality or coating cure. The contractor also set up electric heaters in line with the dehumidifiers to bring the steel to an acceptable temperature during the winter months.

### Preparing and Coating the Tank

The contractor prepared the interior of the tank for coating by abrasive blasting with coal slag to achieve an SSPC-SP 10, Near White, finish. The roof of the tank was power washed, then rusted areas were spot cleaned to a SSPC-SP 11 (Power Tool Cleaning to Bare Metal), says Scaturro. The operations on the roof of the tank did not require containment, because there were

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no lead-based coatings present, he says. The contractor began work on the interior of the tank, and while this portion of the project was still in progress, began the exterior work once temperatures warmed.

The contractor applied the 100% solids polyurethane coating with heated plural component spray equipment to the

walls, columns, and floor of the tank. The one-coat application ranged in dry film thickness from 30 to 35 mils (750 to 875 micrometers), says Scaturro. The high-solids epoxy coating was applied to the ceiling of the tank in a stripe coat followed by a full coat, yielding a total dry film thickness of 10 to 12 mils (250 to 300 micrometers).

The crew accessed the tank interior (considered a permit-required confined space) through a 36-inch-diameter (1-meter-diameter) manhole, says Scaturro. During blasting operations, the workers wore supplied air respirators; half-face respirators with organic vapor cartridges were worn during painting.

The exterior coating operations encompassed spot priming of the roof with 4 to 6 mils (100 to 150 micrometers) of an epoxy mastic, application of a penetrating epoxy primer at 1 to 1.5 mils (25 to 37.5 micrometers), and top-coating with 2 to 3 mils (50 to 75 micrometers) of a urethane.

The owner provided inspection through its personnel and a consultant. Inspection procedures included confirming the cleanliness of the steel, measuring profile, checking dry film thicknesses, performing high voltage holiday inspection of the polyurethane coating, and taking steel temperature and relative humidity readings. According to Charles Clyne, the consultant, "The job was magnificent from start to finish." The tank was put back into service in May 2005, following water testing and the approval of the local department of health, says Kern.

Alpine Painting and Sandblasting Contractors is located in Patterson, NJ. Carboline Company (St. Louis, MO) manufactures the polyurethane and epoxy coatings used in the tank interior. MAB Industrial Coatings (Broomall, PA) makes the epoxy mastic, penetrating epoxy, and urethane coatings applied to the tank roof. Dryco Drying Services (Northlake, IL) manufactures the remotely monitored dehumidification equipment. H2M (Melville, NY) acted as the consultant to the owner. Tank Industry Consultants (Indianapolis, IN) wrote the coatings specification for the owner.

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