

# Sweet Science

## A Candy Factory Becomes a Biomedical Research Facility

*By Jennifer Kramer*

From a historic past to a high-tech future — the 2,500 square foot, 74 year-old, steel water tower on top of the newly-refurbished Novartis pharmaceutical research facility challenged a team of coatings applicators from Massachusetts-based E.M.C. To preserve the historic integrity of the building, the water tower's renovation had to be completed on site. Standing approximately 25 feet above the factory's roof — roughly 150 feet above ground — the tower itself could not be moved. This meant that the coatings crew would have to go to great heights to blast and paint the tower.





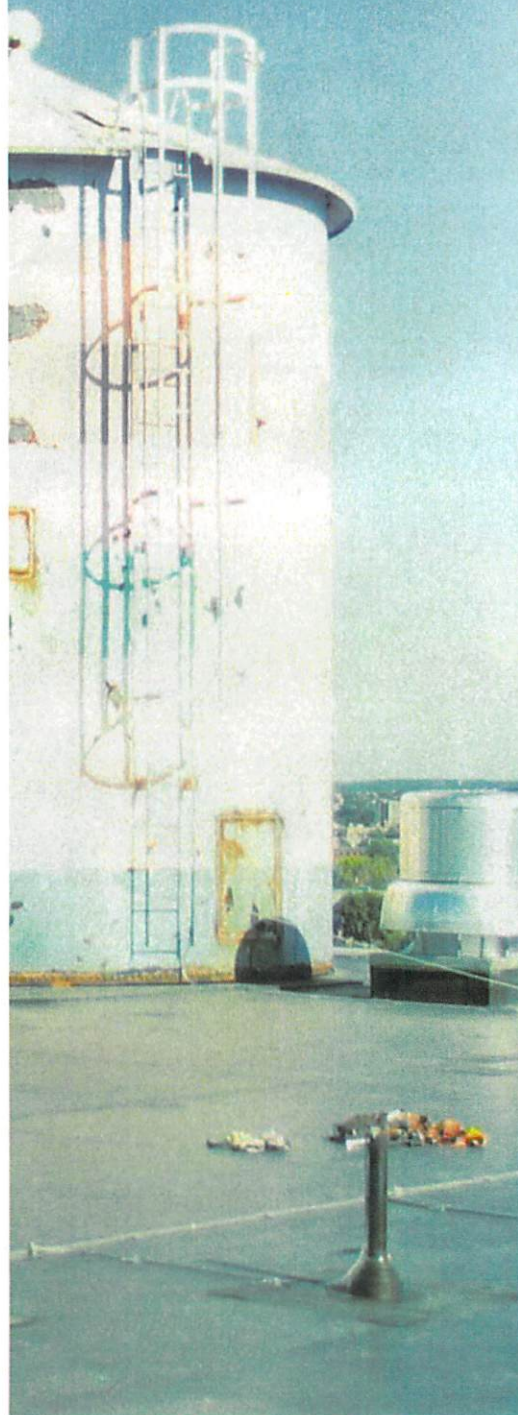
**W**hen Swiss pharmaceutical company Novartis moved its global headquarters and research facilities to the former New England Confectionary Company (Necco) candy factory in Cambridge, Mass., the building had to be completely re-designed, without damaging the historic structure's character or appearance. Special care was required for the restoration of the factory's landmark water tower. Novartis turned to a crew from E.M.C. coatings applicators from Westford, Massachusetts to help with the transformation.

## A Sweet Beginning

Built on the site of a tidal marsh in 1927, the factory at 250 Massachusetts Avenue was the home of Necco for 74 years. At the time of its construction, it was the largest, most modern candy factory in the world. The factory's compound included a power plant, fire house, food laboratories, a fully staffed medical center, and of course, Necco's corporate offices. Rising about 150 feet above the huge complex was a steel water tower that was clearly visible for miles around.

For locals, the Necco factory became famous for more than the candy hearts and wafers it produced. The jutting water tower on the factory's roof became a local landmark, as well as a focal point for community pride. In fact, in 1996, to celebrate Necco's 150th anniversary, the beloved tower was painted to resemble a roll of the multi-colored wafer candy. But by 2001, when Necco closed the doors at its Cambridge factory, the site — including the water tower — had fallen into disrepair.

Erected in 1927, the Necco factory's steel water tower became a local landmark. But when the factory closed in 2001, the tower had seen better days. The paint on its surface had failed, chalking, cracking, and flaking off in various places. The steel itself was heavily corroded with rust and scaling. And there were holes that had to be fixed before any coating work could begin.







Prior to E.M.C.'s arrival on the job, scaffolding had been erected on the rooftop surrounding the tower. Wooden trusses were placed on top of the scaffolding. To enclose the tower and prevent overspray, finely woven mesh tarps were draped over the trusses and around the tower's perimeter. With the scaffolding and tarps in place, all of the necessary materials — including the sandblasting equipment — were lifted by crane onto the factory's roof.

## Leaving Candyland

Occupying an approximate 144,000 square foot (3.3 acre) lot, the empty factory complex provided a perfect location for large-scale industrial operations. Enter Novartis. With facilities already in operation at Massachusetts Institute of Technology (MIT), the pharmaceutical giant needed to expand into a building that was close to MIT and also large enough to house at least 700 scientists.

The Necco factory offered a structurally sound building with interior space big enough to be converted into biomedical research laboratories. As a historic property, the old factory also represented a unique business opportunity for Novartis. If their renovations allowed the edifice to maintain its historic character and appearance, Novartis would be eligible for a tax credit on renovation costs. Chief among the requirements for "historic place" designation was the restoration of the water tower. Novartis wanted to maintain the tower's connection to tradition and the community, while also reflecting the building's high-tech future.

Enter E.M.C. "Not only were we awarded the contract for interior painting, including special coatings in the labs and clean rooms, we were also responsible for the 74 year old water tower on the roof," explains Mark Roux, E.M.C.'s President/Estimator.



"The tough part was that we couldn't move the tower without damaging the building's historic standing." In addition to working under the scrutiny of the historical committee, the coatings crew faced a tight work schedule in increasingly wintry New England conditions.

"When we were awarded the bid," states Roux, "we had 50 days to do the entire 700,000 square foot job, including the tower's 2,500 square foot surface area." This meant long hours and Saturdays spent on the job for the crew. "A four man crew,



# JOB at a GLANCE

## LANDMARK WATER TOWER RENOVATION

### PROJECT:

Restore and coat steel water tank on top of historic candy factory.

### COATINGS CONTRACTOR:

E.M.C.  
P.O. Box 781  
Westford, MA 01886  
(978) 392-2232

### SIZE OF CONTRACTOR:

25 full-time employees  
A four-man crew worked this job

### PRIME CLIENT:

Novartis Institutes for BioMedical Research  
400 Technology Square  
Cambridge, MA 02139

### SUBSTRATE:

Steel

### SUBSTRATE CONDITION:

Heavily corroded with rust and scaling

### SIZE:

2,500 square foot surface area

### DURATION:

Specifications gave 50 days time-frame. Crew completed job in 45 days.

### UNUSUAL FACTORS:

- Building's historical designation meant that crew could not remove the tower to coat it off-site.
- Crew forced to work on steeply sloping roof
- Tight time frame
- All materials had to be lifted to the roof by crane

### MATERIALS/PROCESS:

- Sandblast tank to SSPC #6/NACE 3 commercial blast surface prep
- Prime with Tnemec-Zinc 90-97 zinc-rich primer
- Roll on Tnemec intermediate coat #27
- Roll on Tnemec topcoat #73

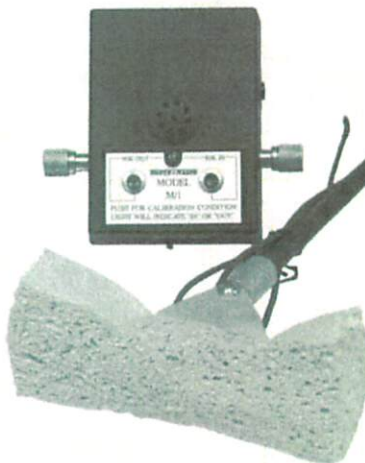
### SAFETY CONSIDERATIONS:

- Harnesses/lines for fall protection
- Goggles, helmets, full face masks/respirators when sandblasting
- Standard respiratory protection when applying coatings

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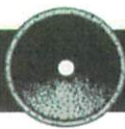
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The tank's 2,500 square foot surface area had to be blasted in roughly 8' x 10' sections to prevent the exposed steel from flash rust. Blasting Silver 30 Sponge Media with aluminum oxide through SpongeJet's 85-L Feed Unit and 35-P Pneumatic Recycler, the crew brought the steel surface to the specified SSPC #6/NACE 3 standard for commercial blast surface preparation. Then they immediately primed the freshly blasted sections with Tnemec's two-component Tnemec-Zinc 90-97 zinc-rich primer.

with a foreman and three applicators, was scheduled to work six-day weeks until the project was completed."

In addition to the tight time-frame, the job began in the late fall. While the dropping temperatures would have little to no effect on the interior coatings work, the climatic conditions could pose problems for the crew as they worked on the tower. "We had to hope that the weather would cooperate with us as we began to restore and coat the water tower," Roux says.

## Sweet Success at Great Heights

"Ideally, we would have removed the tower and coated it off-site," says Roux. "But the requirements for the building's historical designation stated that we couldn't remove anything. We had to tackle it in place."

Novartis hired another contractor to build scaffolding around the tower. "Tarps made of finely woven, breathable mesh were strung around the perimeter of the scaffold," Roux explains, "and wooden trusses were in place across the top of the roof to enclose the area."

The water tower stands roughly 24 feet above the factory roof, which meant that E.M.C.'s crew would be working 150 feet above the ground. To reach the tower, Roux and his crew had to scale a ladder — a climb made more precarious by the

fact that they had to wear all of their safety gear. "The first thing every morning, we would strap on our harnesses and lanyards, along with our goggles, helmets, hoods, and full face mask respirators, and then we would climb," Roux chuckles. "We had to be very careful as we worked so that nothing, including us, slid off of the scaffolding or the steel tank's steeply pitched roof."

While the crew was forced to climb, all the necessary materials, including the sandblasting equipment, were lifted by crane onto the factory's roof.

## The Coatingsman Can

Although the tank had been painted to resemble a giant roll of Necco wafers in 1996, it had seen little, if any, restoration work after that. "The steel tank was in really bad shape by the time we got to it," Roux recounts. "It was heavily rusted, had a ton of scaling, and there were holes in several places."

Prior to the start of E.M.C.'s work, a welding company had been hired to put steel plates over the

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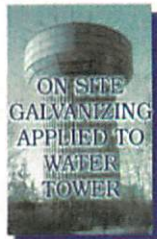
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holes in the tank. But before Roux and his crew could even think of coating the roughly 2,500 square foot tank, they had to sandblast away the ravages of time.

The massive tank had to be sandblasted in roughly 8-foot by 10-foot sections to prevent the exposed steel from flashing in the moist autumn air. Using SpongeJet's 85-L Feed Unit and 35-P pneumatic recycler, the crew blasted the tank's steel surface to SSPC #6/NACE 3 standard for commercial blast. Roux says, "We used Silver 30 Sponge-Media with aluminum oxide to blast the tank clean." Then the freshly blasted steel had to be immediately primed. "After we blasted a section, we would roll on Tnemec's Tneme-Zinc 90-97 zinc-rich primer." The crew used 2 1/2 inch brushes, as well as 3/8-inch nap, 9-inch rollers to apply this two-component, reddish gray primer coat at a dry film thickness (DFT) of 2 1/2 to 3 1/2 mils. This moisture-cured primer coat was allowed to cure for two hours.

When the primer had cured, the crew again used brushes and rollers to apply an intermediate coat of Tnemec's F.C. Typoxy Series 27 polyamide epoxy. Applied at a DFT of 3 to 4 mils, this gray second coat was allowed to cure for six hours.

The intermediate coating was followed by a topcoat of Tnemec's Endura-Shield, Series 73 aliphatic acrylic polyurethane, applied at 2 1/2 to 3 mils thick. For this finish coat, the crew rolled the semi-gloss coating in white onto the tank's



While crew members on the scaffolding blasted the steel tank, one team member remained on the roof, monitoring the 85-L Feed Unit and 35-P Pneumatic Recycler. The crew had to work quickly — blasting and painting while the weather remained fair. They began the job in autumn and the sunny days were dwindling.

## VENDOR TEAM

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The team from E.M.C. blasted the tank's steel surface with SpongeJet's Silver 30 Sponge Media with aluminum oxide (left). This fast-cutting blasting media quickly, dryly, and with little dust, produced a 3+ mil surface profile — making it ideal for use in the tarp-enclosed environment. Then using 2 1/2" brushes and 9" rollers, the crew applied Tnemec's Tneme-Zinc 90-97 zinc-rich primer onto the freshly blasted surface (right). This moisture-cured, reddish-gray primer coat rapidly cured in the autumn air, allowing the team to apply an intermediate coat of Tnemec's F.C. Typoxy Series 27 polyimide epoxy within two hours of the primer coat's application.



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body. The same product was applied in a bright blue onto the tank's roof. The finish coat took six hours to cure.

## A Contest Worthy of Willy Wonka

When the E.M.C. crew climbed down the ladder for the last time, they turned to gaze up at what Roux describes with a chuckle as "40 days of blasting, priming, and painting." They had created the perfect blank canvas for the water tower's next incarnation as a high-tech landmark.

Recognizing the water tower's importance to the community, and in celebration of the old candy factory's transformation into a state-of-the-art medical research laboratory, Novartis launched a contest reminiscent of the famous search for Willy Wonka's golden ticket in Roald Dahl's children's classic, *Charlie and the Chocolate Factory*.

Using the tower's previous stint as "the world's largest roll of Necco wafers" as inspiration, Novartis launched a search for the perfect design for a colorful landmark reflecting the new life of the building beneath the water tower. They sponsored a "competition of ideas" among local schools. The winning design, an image of a DNA double helix strand, wraps around E.M.C.'s gleaming white tower.

According to Roux, "The DNA graphic, which was applied by another company, really unifies the entire factory — and ties it back to its colorful past." Aaah. The sweet taste of success. **CP**

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