

“BRAND” NEW ROOF WASH BAY REHAB CONCRETE TROUBLE

NOVEMBER 2016

CoatingsPro™

M A G A Z I N E

MEN OF STEEL

2016
WEBSHOTS

YOUR GUIDE TO HOT INDUSTRY WEBSITES
PG.40

SPEC'ING STATIC DISCHARGE FLOORS «

DEHUMIDIFICATION Q&A «

JOB COSTING: THE TRUTH «

Jacked Up Tank Job

BY JACK INNIS, CONTRIBUTING EDITOR

PHOTOS COURTESY BOSWELL'S CONSULTING TESTING SERVICES

Craig Winter and his Blastco coatings crew were jacked up! While his team brings its “A” game to every project, this particular 10-million-gallon (~37.8 million L) steel water tank was special. They had a history with it.

The 231-foot-diameter by 35-foot-tall (70.4 m x 10.7 m) tank — built in 1988, owned by the City of Austin, Texas, and operated by Austin Water — was last coated by Blastco.

The 17-year-old coating system had seen better days. In addition to sporting a drab overall appearance, recent exterior inspections revealed areas of failed adhesion between primer and finish coats. Inside, things were worse. Rust stained the roof plates, bloomed between rafter tops and roof plates, and even caused a garden-hose-sized leak in the tank's 24-inch-diameter (60.9 cm) overflow pipe. Hey! Water is scarce in Texas. No one wants to stand around twiddling their thumbs watching a leak grow larger!

Rarin' to Go!

Project manager Winter and his crew were rarin' to go on this 205,000-square-foot (19,045.1 m²) project. Little did they know they'd be in an even bigger hurry to beat the 160-day deadline!

“We've done similar tanks for Austin Water and know what to expect,” said Blastco General Manager Steve Wissing. “Austin Water needs these projects completed during low demand season. We begin in early January so the tanks are up and running before summer.”

The 10- to 15-man Woodlands, Texas-based Blastco crew got off to a fast start by attacking the exterior tank wall with a FasterBlaster 32 robotic abrasive blaster. The RBW Enterprise's FasterBlaster comprises a robotic blast element that goes up and down tank walls on cables. A wheeled winch rig tethered to a tie down at the center of the roof helps it move around the perimeter. A ground operator with a remote control paces the robot's vertical journey while a man on the roof moves the winch after each completed vertical pass. If

this all sounds like fun and games, achieving the specified NACE No. 2/Society for Protective Coatings (SSPC) Surface Preparation (SP) 10: Near-White Blast Cleaning with a 3.5-mil (88.9 microns) minimum anchor profile actually takes a lot of work!

Since the thickness and toughness of coatings varies from project to project, it took considerable trial and error to find the perfect aggregate. In this case, the crew settled on a 70/30 blend of Ervin steel shot and steel grit. The grit comprised a 25 and 40 mix.

“We combine shot and grit to make the coating come off faster,” said Winter. “If you run straight steel grit, you risk taking off too much, cutting too deep, and wasting paint. It's counterintuitive, but steel shot keeps the substrate from getting over-profiled.”

While a FasterBlaster remote control operator could conceivably do his job sitting in a lawn chair, it takes a small army of fervent workers to keep the blast job on pace.

“The aggregate comes in 55-gallon [208.2 L] drums, so the ground crew uses small buckets to keep the hopper full,” said Winter. “Between loading, recycling, vacuuming, and moving everything around the tank perimeter to keep up with the FasterBlaster, at the end of a 12-hour shift, the ground crewmen really know they've been working.”

While all this was going on, crewmen on the roof ran the same aggregate through their Blastrac EBE 500 walk-behind abrasive blaster. Others used a Schmidt 6-ton (5,443.1 kg) blast rig filled with MineralTech 30/60 garnet to attack areas that the FasterBlaster and EBE 500 couldn't reach.

No one wants to run the risk of flash rust destroying exterior prep work. Virtually every time the blast crew stopped, they used Graco 33:1 airless guns armed with #417 tips to spray apply 3 to 4 mils (76.2–101.6 microns) dry film thickness (DFT) in a single pass of Dimetcote 9H inorganic zinc silicate primer. PPG's Dimetcote 9H is a solvent-borne system, so the three components (liquid, powder, and activator) were agitated with air-powered mixers to prevent electric sparks from igniting the solvent vapor.



The 231-foot-diameter by 35-foot-tall (70.4 m x 10.7 m) tank — built in 1988, owned by the City of Austin, Texas, and operated by Austin Water — was last coated by Blastco.

Steel Tank Job



It was up to Blastco, a TF Warren Company, to coat and line a 10-million-gallon (37.8 L) steel water tank in Austin, Texas. They had 160 days to complete the ~205,000 sq.-ft. (19,045.1 m²) job.



Before coating the steel, they first had to abrasive blast the tank to NACE No. 2/Society for Protective Coatings (SSPC) Surface Preparation (SP) 10: Near-White Blast Cleaning. They used various equipment to do so.

Pumped Up

The blast and spray crews relied on a JLG 6042A boom lift to access upper portions of the tank walls.

“We didn’t have to get a crane in here because the tank’s only 35 feet [10.7 m] tall,” said Winter. “We found the JLG economical and versatile; we used it just about everywhere on

the jobsite.”

To produce a uniform primer coat, the crew pumped up their Graco airless to approximately 120 psi (827.4 kPa) at the tip, stood back a bit, and sprayed a crosshatch pattern. Overspray was not much of an issue with this primer.

“When Dimetcote hits the tank, it dries so fast it only looks



JOB AT A GLANCE



Inside and outside the tank, the 10- to 15-person crew wore fall protection when working on scaffolding, boom lifts, and near the roof perimeter. When blasting, they also wore air-supplied hooded respirators.

wet for about 10 to 15 seconds,” Winter said. Containment was not required on this project, and primer overspray precautions amounted to little more than not parking trucks near the tank.

After blasting and priming the tank exterior, the crew parked their Graco airless and geared up to apply two layers of Amercoat 385 intermediate coat. They were to apply 3 to 8 mils (76.2–203.2 microns) total DFT of that coating. So far, weather hadn’t been much of a factor, and the job was basically on track. But since springtime in Texas can dish up unpleasant meteorological conditions, the crew needed to shift work to the tank interior ASAP! But there was a problem.

Once both coats of Amercoat went down, they’d only have a 30-day maximum recoat window at 70° F (21.1° C) before the PPG PSX 700 topcoat was specified to be applied. With bad weather on the way, it would take too long to complete the entire 10-million-gallon (37.8 million L) tank before tackling the interior. There had to be a way to get inside faster, and Winter found it! His crew would split the Amercoat into two installments.

“Amercoat 385 has an unlimited (non-immersion)

To access areas between the roof plates and the tops of the rafters, the entire 231-foot-diameter (70.4 m) roof had to be lifted approximately 4 inches (10.2 cm) off the support braces.



PROJECT:

Apply interior and exterior coating systems to a 10-million-gallon (37.8 L) steel water tank in Austin, Texas

COATINGS CONTRACTOR:

Blastco, a TF Warren Group Company
1400 Woodloch Forest Dr., Suite 500
The Woodlands, TX 77380
(832) 299-3200
www.tfwarren.com

SIZE OF CONTRACTOR:

~125 employees

SIZE OF CREW:

10–15 crew members

PRIME CLIENT:

City of Austin
2006 E 4th St.
Austin, TX 78702
(512) 974-2000
www.austintexas.gov

SUBSTRATE:

Steel

CONDITION OF SUBSTRATE:

Fair, built in 1988

SIZE OF JOB:

~205,000 sq. ft. (19,045.1 m²)

DURATION:

160 days allowed

UNUSUAL FACTORS/CHALLENGES:

- » To access areas between roof plates and tops of rafters, the entire 231-foot-diameter (70.4 m) roof was jacked up.
- » The project was slated for winter/spring when water demand was low.
- » There was a two month interval between applications of Amercoat 385.

MATERIALS/PROCESSES:

To the Exterior:

- » Abrasive blasted tank walls and roof with a 3.5-mil (88.9 microns) minimum anchor profile
- » Spray applied 3–4 mils (76.2–101.6 microns) dry film thickness (DFT) of PPG Dimetcote 9H inorganic zinc silicate primer in one pass
- » Roll and brush applied two coats of Amercoat 385 to achieve 3–8 mils (76.2–203.2 microns) total DFT; pressure washed before second coat
- » Roll applied two coats of PPG PSX 700 topcoat to achieve 5–7 mils (127.0–177.8 microns) total DFT

To the Interior:

- » Lifted the roof approximately 4 inches (10.2 cm) off the support braces
- » Abrasive blasted tank walls, ceiling, floors, rafters, and braces to NACE No. 2/SSPC-SP-10: Near-White Blast Cleaning
- » Spray applied direct to metal one coat of PPG Amerthane 490 to achieve ~30 mils (762.0 microns) DFT

SAFETY CONSIDERATIONS:

- » Evacuated from steel tank during electrical storms
- » Wore fall protection when necessary
- » Wore air-supplied hooded respirators when abrasive blasting

Steel Tank Job



Weather played an important role on this job. First, the project took place during the winter and spring months when the area's water demand was low. Also, the crew had to stop work during thunderstorms.

maximum recoat window, but only if coated with itself," explained PPG technical sales representative Greg Baughman. By deferring the second coat until they were ready to tackle the PSX topcoat, the crew could work indoors during the bad weather season and avoid a huge chunk of downtime.

Halfhearted Plan

While the crew hurried to rig up on the outside of the tank, Winter thought feverishly about how best to plan the first Amercoat 385 application. To avoid overspray issues with longer drying times, he decided the men would brush and roll from here on out. That meant working from a 30-foot (9.1 m) scaffold. Knowing that scaffold work presents potential logistical bottlenecks, Winter realized a halfhearted plan wouldn't cut it! Here's what he came up with:

Wearing Web Devices fall protection gear, three crewmen on the scaffold would apply Amercoat 385 with 9-inch (22.9 cm) rollers with $\frac{3}{8}$ -inch (0.95 cm) naps. They'd brush apply a stripe coat on the weld seams to fill in any holidays. While they rolled and brushed, the ground crew would quickly mix batches of the two-part epoxy. At the end of each vertical run, when the painters came down to move the scaffold, the mixers would load them up with more paint, assembly line style.

"I told them to brush first up and down, then side to side," said Winter. "The idea was to finish on the weld seams and to not stop in between to avoid visible stop lines showing in the topcoat." The weld seams were approximately every 8 feet (2.4 m) across the tank.

While the crew finished roller applying Amercoat 385 on the roof, Winter turned his attention to the interior. The first goal was again to abrasive blast to NACE No. 2/SSPC-SP10: Near-White Blast Cleaning with a 3.5-mil (88.9 microns) minimum anchor profile. To do so, the team wheeled their Blastrac onto the floor of the tank. They also erected a 10-foot by 20-foot (3.0 m x 6.1 m) wheeled scaffold so they could use their ARS blast rig to attack walls, rafters, ceiling, and overflow pipes.



The tank interior was also abrasive blasted to NACE No. 2/SSPC-SP-10: Near-White Blast Cleaning. Then the crew spray applied a coat PPG Amerthane 490 at ~30 mils (762.0 microns) dry film thickness (DFT).

But there was a major problem: rust blooms between rafter tops and roof plates! Ignore them, and you're leaving Austin Water with a ticking time bomb of corrosion.

Jacked Up

"We needed to somehow blast and spray the rafter tops and ceiling panels, so we jacked up the roof," said Winter.

Using a dozen or so 2-ton (1,814.4 kg) hydraulic jacks, the crew raised the entire 231-foot-diameter (70.4 m) roof just enough to allow them to insert 4-inch by 4-inch (10.2 cm x 10.2 cm) wooden blocks to safely bear the weight. (Apparently, Texas tank designers know better than to weld roofs to rafters and walls.) With rafter tops and the entire ceiling exposed, the crew had just enough access to blast and spray.

The crew then loaded their Schmidt blast rig with the same steel shot and grit combination used for the exterior work. Donning Bullard air-supplied blast hoods, they dialed up nozzle pressure to 130–155 psi (896.3–1,068.7 kPa) and held on tight.

"You'd better be ready to pull the dead man's switch because, like a firehose, that nozzle can push back quite a bit,"

Once the exterior substrate was prepped, the crew could start to coat. The system started with 3–4 mils (76.2–101.6 microns) DFT of Dimetcote 9H inorganic zinc silicate primer.



The NACE International Institute Contractor Accreditation Program (NIICAP) is a premier, industry-driven, and industry-managed accreditation program that validates a contractor's quality assurance program, support practices, and production processes.

There are four options offered as a part of the program for contracting companies working in high-performance coatings:

1. AS-1-Field, which addresses all industrial and marine surface preparation and coating/lining applications performed in the field when invoked.
2. AS-1-Shop, which addresses all industrial and marine surface preparation and coating/lining applications performed in the contractor's shop when invoked.
3. AS-2 Hazardous Waste Removal and Management Program.
4. AS-3 In-House Applicator Trade Skills Training Accreditation.

After achieving accreditation, contractors should receive:

- Improved quality through best practices and industry-developed audit standards
- Reduced risk and improve safety by supporting a culture of Health, Safety, and the Environment (HSE).
- Minimized re-work.
- Increased customer satisfaction.
- Recognition as a premier coating contractor in the industry.

NIICAP applications are now open for contractors working in industrial projects either in the field, in the shop, or both. The first accredited company, Blastco, completed the process on August 2016. For more information, contact: NIICAP, www.niicap.net, info@niicap.net

said Winter of the trigger. The blast crew maximized production by aiming perpendicular to the substrate and working their nozzles in wide arcs, somewhat like a welder might. With the goal of spraying the entire interior at once, the crew prevented flash rust by running Bry-Air 100,000 BTU dehumidifiers

whenever they knocked off for the day.

Once done with the interior blast, the crew fired up their Graco plural component rig and spray applied direct-to-metal a single coat of PPG Amerthane 490 to achieve approximately 30 mils (762.0 microns). Using a big #517 tip, the nozzle men hit

The crew applied 3–8 mils (76.2–203.2 microns) total DFT of Amercoat 385, but had to wait two months between the coats. That meant coming back in and pressure washing in between, too.



Steel Tank Job



The final layer of coating was 5–7 mils (127.0–177.8 microns) DFT of PSX 700 topcoat, which the crew roll applied. With that, the city of Austin was ready to go!

the correct mil thickness by making one horizontal pass, one vertical pass, and a final horizontal pass. A second crewman on the scaffold helped move the heated hoses, and he monitored progress with a wet film gage. The application went well...for a while!

A Needed Lift!

No one working indoors expects to get hit with a weather shutdown, but this crew did!

“A series of thunderstorms came down on us, and you can’t work inside a steel container during a lightning storm,” said Winter. “In addition to shutting us down, the heavy rains turned the jobsite into a slop hole. Right outside the access door, there was 6 inches [15.2 cm] of water on the ground. It was a swamp! We had to use Tsurumi 2-inch [5.1 cm] electric submersible pumps to drain it. Even then, the ground got so muddy we had to walk on wooden pallets for a couple days. I just prayed the dehumidifiers didn’t fail; high humidity like that scares me to death!”

Just when the deadline seemed out of reach, the crew got a needed lift. The sun came out! The men finished spraying inside and returned to the great outdoors. They power washed the tank exterior and brush applied the second coat of Amercoat 385. As advertised, Amercoat stuck to itself despite the two-month recoat interval. With one eye on the clock, the crew intensified its efforts and brush applied two coats of PPG PSX 700 topcoat to achieve 5 to 7 mils (127.0–177.8 microns) total DFT. It was like running a sprint right after a marathon, but the team finished on time.

Winter is proud of the way his 10- to 15-man crew sucked it up to beat this deadline. “The guys did great,” he said. “On a large project like this, problems crop up, but our crew has the training and experience to take everything in stride.”

PPG rep Baughman appreciates how hard the Blastco crews work, not just on individual projects but to stay at the top of their game. “Their reputation is at the highest level, and the employees they hire reflect that,” he said.

VENDOR TEAM

ARS Recycling Systems

Equipment manufacturer
4000 McCartney Rd.
Lowellville, OH 44436
(330) 536-8210
www.arsrecycling.com

MineralTech

Material manufacturer
P.O. Box 1027
Highlands, TX 77562
(281) 462-4220
www.mineraltechllc.com

Blastrac NA

Equipment manufacturer
13201 N Santa Fe Ave.
Oklahoma City, OK 73114
(800) 256-3440
www.blastrac.com

PPG

Coatings manufacturer
One PPG Place
Pittsburgh, PA 15272
(888) 977-4762
www.ppgpmc.com

Bry-Air, Inc.

Equipment manufacturer
10793 State Route 37 W
Sunbury, OH 43074
(877) 427-9247
www.bry-air.com

RBW Enterprises

Equipment manufacturer
136 Hillwood Circle
Newnan, GA 30263
(770) 251-8989
www.rbwe.com

Bullard

Safety equipment manufacturer
1898 Safety Way
Cynthiana KY, 41031
(877) 285-5273
www.bullard.com

Schmidt by Axiom Manufacturing, Inc.

Equipment manufacturer
11927 South Highway 6
Fresno, TX 77545
(800) 231-2085
www.axiommmfg.com

Ervin Industries

Material manufacturer
3893 Research Park Dr.
Ann Arbor, MI 48108
(734) 769-4600
www.ervinindustries.com

Tsurumi

Equipment manufacturer
1625 Fullerton Ct.
Glendale Heights, IL 60139
(630) 793-0127
www.tsurumipump.com

Graco Inc.

Equipment manufacturer
88 11th Ave. NE
Minneapolis, MN 55440
(800) 647-4336
www.graco.com

Web Devices

Safety equipment manufacturer
9201 Winkler Dr.
Houston, TX 77017
(800) 262-4891
www.webdevices-usa.com

JLG

Equipment manufacturer
1 JLG Dr.
McConnellsburg, PA 17233
(717) 485-5161
www.jlg.com

To that end, Blastco recently became the first company to achieve NACE International Institute Contractor Accreditation Program (NIICAP) certification. “We believe NIICAP will get us into certain projects where only the most highly qualified people can do the work,” said Wissing.

And Craig Winter and his Blastco coatings crew are jacked up about that prospect! **CP**