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Down in the Dumps? Not With This Green Fix!

BY **JACK INNIS, CONTRIBUTING EDITOR**
PHOTOS COURTESY **BRAZOS URETHANE, INC.**

Sierra Community College District was down in the dumps! The college district needed to replace 10 roofs at its Rocklin, Calif., campus, but administrators simply couldn't bear the thought of tearing up approximate 134,700 square feet (12,514.0 m²) of single-ply membrane and carting all that waste to the local landfill. Among other offerings, the college teaches earth sciences, environmental studies, and conservation. Hey, how can you advocate environmental stewardship and not practice what you preach? Administrators had to find a better solution.

Thankfully, a coatings crew from Brazos Urethane Inc. came up with a green alternative that left Sierra College beaming with joy.

Waste Not, Want Not

Brazos' Western Division Manager Craig Opel proposed restoring the existing roofs with Tremco Inc.'s AlphaGuard, a bio-based, 64-mil (1,625.6 microns) total approximate dry film thickness (DFT) monolithic polyurethane coating system. Restoring the roofs presented a broad array of savings: Less cost than a teardown, no expensive treks to the landfill, and no unnecessary waste of natural resources to replace the torn-out roofing.

Sierra expressed interest but voiced three major concerns. First, the project had to wrap up before fall classes began. This gave the coatings crew only 70 days — about half the time typically needed. Second, with summer school classes already underway in the 10 classrooms, the crew had to control odor and overspray. Finally, drought and environmental regulations forbid the use of standard pressure washers because they consume large amounts of water and produce runoff.

With the clock ticking, Opel knew that any delay in finding solutions to these concerns could amount to a missed deadline. Apparently the old (environmentally friendly) adage, "waste

For the crew from Brazos Urethane, applying the new coating system to 10 roofs at Sierra Community College in Calif. was a unique project. They were the first to spray apply this green system commercially.

The Brazos Urethane team used two other teams to kick off this approximately 134,700-square-foot (12,514.0 m²) project: A cleaning division washed and vacuumed the poor roofs and another crew surveyed the roof for waterlogged foam.

Restoring the roofs presented a broad array of savings: Less cost than a teardown, no expensive treks to the landfill, and no unnecessary waste of natural resources to replace the torn-out roofing.

It took 10 Brazos Urethane crew members and teamwork to complete this project. Throughout the project, the crew wore respirators and fall protection and used warning lines when required.

not, want not" applies to time as well as material goods!

"It had never been done before, but we decided to spray apply the AlphaGuard system," said Opel. "Specs called for brush, roll, or squeegee, but our experience and expertise told us we could make spraying happen. We were confident with the product, and Tremco was confident with us. Getting Tremco's go-ahead made the deadline doable, because spraying is typically twice as fast as brushing, rolling, or squeegeeing."

With a firm handle on the Sierra's first issue, the deadline, Opel set the wheels in motion. He had ideas for the other two issues; he just hoped they'd work out. First order of business was to clean the existing roofs without pressure washing.

Once the waterlogged areas were identified, the Brazos Urethane crew replaced that foam and covered any exposed areas with fiberglass mat roof boards. The buildings were inhabited throughout the project.

Recycle and Reuse

California water and waste stream regulations are among the toughest in the country, and Rocklin's Placer County is no exception. Most notably, allowing water from pressure washers to enter storm drains or sewer systems is prohibited. Thankfully, Tremco's WTI RoofTec Roof Cleaning Division knows the ropes. Using a machine about the size and shape of a floor buffer, a two-man crew attacked the roofs with powerful, non-abrasive, rotating water jets. The dirt and spent water were instantly captured by a vacuum system and sent to a collection tank for filtering. The Tremco crew then sprinkled the filtered water onto the campus landscape — all on the up and up. How's that for recycling and reusing?

Tremco also performed an infrared-based Thermacore Roof

Around the seams, flashings, and seam laps, the crew installed a polyester fabric into the seam sealant. The fabric was PERMAFAB and the sealant was SOLARGARD, both from Tremco.

Moisture Survey that identified waterlogged insulation beneath the roof's membrane system. With the scope of repairs finally defined, the Brazos crew couldn't wait to start!

Jobsite access was great. After coordinating parking lot closures with school facility management, the men backed their 24-foot (7.3 m) Ford F-650 and 26-foot (7.9 m) International 4900 box trucks right up to the buildings. First, the Brazos crewmen cut out soggy insulation panels and replaced them with 4-foot-by-8-foot (1.2 m x 2.4 m) sheets of 2-inch thick (5.1 cm) GAF foam board. They topped the repaired sections with ½-inch-thick (1.3 cm) DensDeck fiberglass mat board and sealed the newly created joints with Tremco SOLARGARD polyurethane seam sealer. But sealing didn't stop there.

"We used 4- and 6-inch [10.2 cm and 15.2 cm] rollers with ⅜-inch [1.0 cm] nap to spread seam sealer over pre-cut strips of Tremco PERMAFAB polyester fabric, maintaining 4-inch [10.2 cm] overlaps," said Brazos superintendent Victor Reyes. "We did the same on all flashings and on every existing membrane seam to create an additional line of defense against leaking."

What's That Smell?

The crew then fired up their Graco 833 airless rig and sprayed a 1-mil (25.4 microns) approximate DFT single pass of Tremco AlphaGuard WB water-borne primer. Unlike the AlphaGuard basecoat and topcoat, the seam sealer and primer were not zero volatile organic compound (VOC). Therefore, the Brazos crew scheduled as much work as possible around classroom hours so students wouldn't be mumbling, "What's that smell?"

"We're very conscious about environmental stewardship at the Sierra Community College District," said Colin Irwin, deputy director of plant operations. "We always try to look at the full impact of our decisions, so in advance of this project, we actually brought test batches of (still curing) coatings into one of our buildings to see how much odor they let off. Brazos complied with all safety requirements and worked well with the

JOB AT **A GLANCE**

PROJECT:
Apply bio-based coating system on 10 roofs at a community college in California

COATINGS CONTRACTOR:
Brazos Urethane Inc.
1031 6th St. N
Texas City, TX 77590
(866) 527-2967
www.brazosurethane.com

SIZE OF CONTRACTOR:
~150 employees nationwide

SIZE OF CREW:
10 crew members

PRIME CLIENT:
Sierra Community College, Rocklin
5000 Rocklin Rd.
Rocklin, CA 95677
(916) 624-3333
www.sierracollege.edu

SUBSTRATE:
Single-ply, roll-down membrane

SUBSTRATE CONDITION:
Poor; near end of service life with multiple leaks

SIZE:
~134,700 sq. ft. (12,514.0 m²)

DURATION:
70 days

UNUSUAL FACTORS/CHALLENGES:
- The school placed emphasis on environmental issues, such as avoiding landfill use, saving raw materials, minimizing odors and volatile organic compound (VOC) discharge into atmosphere, and saving water.
- The buildings were occupied while the crew worked on the roofs.
- This was the first commercial spray application of Tremco AlphaGuard urethane system.

MATERIALS/PROCESSES:
- Had Tremco's WTI RoofTec Roof Cleaning Division hydro-clean the roofs and vacuum the spent materials
- Had another Tremco crew complete a Thermacore Roof Moisture Survey to identify waterlogged foam insulation
- Replaced waterlogged foam and covered the areas with fiberglass mat roof boards
- Installed Tremco PERMAFAB polyester fabric into Tremco SOLARGARD polyurethane seam sealant at repair seams, flashings, and all existing PVC and TPO seams laps
- Spray applied a 1-mil (25.4 microns) approximate dry film thickness (DFT) single pass of Tremco AlphaGuard water-borne primer
- Spray applied a 32-mil (812.8 microns) approximate DFT single pass of Tremco AlphaGuard bio-based polyurethane basecoat
- Spray applied a 32-mil (812.8 microns) approximate DFT single pass of Tremco AlphaGuard bio-based polyurethane topcoat

SAFETY CONSIDERATIONS:
- Wore organic vapor respirators and fall protection harnesses as required
- Used warning line system as required

VENDOR **TEAM**

DensDeck by Georgia-Pacific Building Products
Material manufacturer
133 Peachtree St. NE
Atlanta, GA 30303
(404) 652-4000
www.gp.com

Ford
Equipment manufacturer
P.O. Box 6248
Dearborn, MI 48126
(800) 392-3673
www.ford.com

GAF
Material manufacturer
1361 Alps Rd.
Wayne, N. J. 07470
(973) 628-3000
www.gaf.com

Graco Inc.
Equipment manufacturer
88 11th Ave. NE
Minneapolis, MN 55413
(612) 623-6000
www.graco.com

International Trucks
Equipment manufacturer
2701 Navistar Dr.
Lisle, IL 60532
(331) 332-5000
www.internationaltrucks.com

Motorola Mobility
Equipment manufacturer
222 W Merchandise Mart Plaza,
Ste. 1800
Chicago, IL 60654
(800) 668-6765
www.motorola.com

Tremco Inc.
Coatings manufacturer
3735 Green Rd.
Beachwood, OH 44122
(800) 852-9068
www.tremcoroofing.com

students and faculty."

With the primer in place, the Brazos crew steeled their nerves for the first-ever spray application of AlphaGuard BIO basecoat.

"The two-part polyurethane AlphaGuard BIO basecoat and topcoat are bio-based," said Bill Burke, Tremco senior field supervisor. "That means a certain percentage of the material comes from agriculture. It's like the corn-based ethanol used to fuel your car; that's how our BIOs are formulated."

The Brazos crew fired up their Graco XP70 plural-component sprayer, which is designed to pump, mix, and atomize high-viscosity, high-solids coatings such as the AlphaGuard basecoat.

"We applied the 32-mil [812.8 microns approximate DFT] basecoat in one pass," said Reyes. "The main challenge on both BIO coats was to make sure we stayed in contact with the guy in the box van watching the pumps. You can't stop spraying or the stuff sets up in the hose."

By way of example, both the AlphaGuard basecoat and topcoat, when conventionally mixed, have pot lives of 20 to 25 minutes at 77° F (25° C) at 50 percent relative humidity (RH), according to the manufacturer's data sheets. The crew used Motorola walkie-talkies to communicate the need to switch drums or stop spraying at the end of the day.

The crew primed the roofs with Tremco AlphaGuard, which was spray applied at ~1 mil (25.4 microns). That water-borne primer was the first step in this system, suggested by Brazos Urethane's Western Division Manager Craig Opel.

Scrap Those Plans

The Brazos crew felt great about addressing Sierra Community College's three main concerns. They had worked around a ban on pressure washers, figured out a way to avoid exposing students to unwanted odors, and were on track to finish on time. Like a well-oiled machine, they transitioned quickly to topcoat application. While crewmen in the box van switched from the AlphaGuard BIO basecoat to the AlphaGuard BIO topcoat, others cleaned the spray equipment with methyl ethyl ketone (MEK) solvent. The crew then fired up their Graco XP70 and began applying the 32-mil (812.8 microns) approximate DFT AlphaGuard BIO topcoat in a single pass.

The Brazos team was on track to finish before fall classes began when an issue all too familiar to coatings professionals reared its ugly head. It can get windy in the foothills of the Sierra Nevada Mountains, and in addition to spraying carefully near roof edges, Reyes had coordinated parking lot closures adjacent to rooftops that were being sprayed. This worked well... most of the time!

"We lost two days because it simply got too windy to work," said Opel. "Overspray was a big concern because nobody wants to pay to repaint someone else's car. Losing time made this job more difficult, but if Victor hadn't made the call, we could have hit quite a few cars."

In addition to days lost to excess wind, the physical spraying of the topcoat was anything but a high-speed operation. "We got our best results by moving the gun slowly and cross-hatching our spray pattern," said Reyes. "It takes a bit of time, but the BIO topcoat sprays nice and thick and covers really well."

With delays mounting, it looked like Brazos might have to scrap those plans to finish on time. To get back on track, the crew logged extra hours, mostly behind the scenes, maintaining and rebuilding equipment, organizing, and lining up gear for the next roof.

The second and third layers of coating were Tremco AlphaGuard polyurethane, applied at ~32 mils (812.8 microns) each. In addition to the bio-based system, the crew avoided landfill use and minimized volatile organic compounds (VOCs).

"We are extremely satisfied with the end result," said Colin Irwin of the college. "One of my most important rules is that a contractor does what he says he's going to do, and Brazos did so…"

"Hey, we finished early, so you can take the afternoon off," said no one in the coatings business ever!

The extra effort slowly brought this project back on track. Then one afternoon came a call no coatings professional wants to get! Overspray had landed on a car. The crew felt dejected and wondered what in the blazes had happened.

Down in the Dumps

Opel, Reyes, and Irwin met to check out the car. It belonged to a faculty member, and overspray had gotten it real good! The three agreed to look into the matter further, but Reyes needed answers quick. If they were doing something wrong, they needed to rectify it before they repeated the mistake. This type of problem can put an entire project in a holding pattern while things get sorted out. Luckily, resolution came quickly. Brazos was not at fault.

"We looked into the matter more deeply on our end," said Irwin. "We discovered that the faculty member actually drove around barricades so he could park next to the building. The Brazos crew up on the roof couldn't see below and (rightfully) assumed the parking lot was empty." No readdressing strategies needed.

Getting Good Grades

With a potential overspray crisis averted, the Brazos crew pulled out all stops and wrapped up on time.

Opel and Burke liked how the completed project appeared. They brought Irwin up to take a look. After all, his was the only opinion that mattered.

"We are extremely satisfied with the end result," said Irwin. "One of my most important rules is that a contractor does what he says he's going to do, and Brazos did so. They restored the roofs at half the cost of replacement. The roofs look great and are performing well. We've pretty much decided that this is going to be our technical standard for the district. I can't justify doubling the cost for a new roof when we have this option."

Burke applauded Brazos' workmanship, technical expertise, and pioneering spirit. "This is a huge success story, a feel-good story," Burke said. "Other applicators are now spraying AlphaGuard, and we're in the process of updating our technical data sheets to include that process. We've shown this project to several interested parties and plan on continuing doing so. A nearby school district loved it so much they specified it for an 80,000-square-foot [7,432.2 m^2] project. Brazos won that job, too."

Reyes praised his crew for taking the project's hurdles in stride, finishing on time, and laying down a superb coating system. "The roofs look beautiful in form and in function," he said. "They're seamless, and the topcoat is bright white and shiny. The men are extremely proud of what they accomplished."

When Brazos began this assignment, the roofs were literally sprouting leaks faster than Sierra College maintenance workers could plug them. But this job turned out to be a lot more than merely keeping out the rain.

By restoring instead of tearing off the existing roofs, the crew saved landfill space and preserved natural resources. Using an alternative to conventional pressure washing saved water and complied with discharge regulations. Installing a BIO-based coatings system made for a greener project that helped preserve air quality. Replacing inefficient, waterlogged insulation helped lower energy consumption, as did installing a nice, bright, reflective topcoat.

In the end, Opel applauds how the school, supplier, and crew worked together to make this project a success. "Sierra Community College District considers this one of their most successful projects," said Opel. "They're so pleased that they've recommended us, and we've gotten more work out of it."

For a college that only 70 days earlier was completely down in the dumps, that's high praise! ***CP***