

**When
Coating
Asphalt,
Life Can**

**Be Trial by Fire: The Best
Dam Job
in Durango**

By Michele Ostrove



With ventilated hood and safety harness (*above*) this TRS crew member is well-suited to sandblast the slippery, 45-degree slope. Dropping some 40 feet to shimmering Electra Lake (*background*) Terminal Dam is nearly completely waterproofed with an ebony coating of CIM.

The dramatic granite cliffs and breathtaking canyons of the San Juan National Forest near Durango, Colorado provided a scenic backdrop for one of the most challenging coatings jobs Ken Snow had ever faced. The job supervisor for Boulder-based TRS, Inc. gazed at the formidable 1,158-foot length of the Terminal Dam, which dropped some 40 feet to Electra Lake, and pondered his many obstacles.

The contract called for prepping and recoating the 25-year-old hydroelectric dam, operated by Xcel Energy. With 22,000-acre-feet of storage capacity, the dam supplies eight megawatts of power that serves about 8,000 homes in southwestern Colorado. The dam originally had been spray-coated with a thick, CIM urethane waterproofing membrane that resists abrasion, corrosion, and chemicals. According to Ken Kinnard, sales manager for Bowman Industries, the project's CIM distributor, CIM was chosen again for the job because of its superior performance. The coating had bonded well with the substrate, prevented serious oxidation, and weathered the icy



Holding a sandblasting hose while perched on an incline is a balancing act, but safety precautions prevented any unplanned swims throughout the job.

conditions that plague the dam's 10,000-foot elevation from early fall through late spring. But reapplying the CIM was not quite as straightforward as it appeared to be.

"The dam was constructed with asphalt, which caused a lot of problems," said Snow. "Asphalt absorbs heat. When you put on the coating, moisture gets trapped inside the asphalt." The dam's entire surface would have to be sandblasted, and the remaining loose spots of asphalt ground to a smooth finish using a hand-held wire wheel grinder.

"That was a chore in itself," Snow added. "Trying to hold up a sandblasting hose on a 45-degree incline isn't easy to do. As you blow the sand, it gets under your feet and makes you slip and slide." To keep workers from falling into the lake, TRS applied a hoist attachment to the person operating the sandblaster, who wore a full-body safety harness. Because of the close attention paid to safety precautions, said Snow, no one ended up taking an unplanned swim.

A Question of Gravity

To make things even more interesting, the crew took a reading of the original coating and discovered that it wasn't uniformly 60 mils thick, as the specs called for. The former coat of CIM urethane was a sparse 18 mils at the top and a gloppy 120 mils at the bottom. It was clear that the TRS crew would have to overcome a vexing gravity problem if they wanted to do the job right.

"When you use a spray application, the coating doesn't have time to cure, so the thick, heavy urethane slides to the bottom," said Snow. CIM had sent a couple of its consultants to the site, and, after testing that method on the dam wall, they made a quick decision: spraying was out of the question. "We had two industrial spray rigs there all ready to go and couldn't use them," he said.

While crews considered the best application to achieve uniform coverage, there were other problems to deal with, as well.

The Missionary Ridge fire, the second largest in Colorado in 2002, was raging within two miles of the lake. The 78,000-acre forest fire had forced a temporary closure of the Durango & Silverton Narrow Gauge Railroad, which passes through the lake's backyard, and threatened a possible evacuation of the area around the dam. Smoke from the fire hung in the air, creating less than ideal breathing conditions for the workers. To protect their lungs from smoke fumes and sandblasting particles, the crews wore respirators and special hoods ventilated with North fresh-air compressors. Temperatures at times climbed into the 90s.

While Mother Nature threatened her wrath, TRS had to ensure that she was also protected. Electra Lake is stocked with trout, creating what Kinnard called "a fishing paradise." To protect the fish, the 21,000-square-foot dam would have to be coated with an ANSI-NSF-61 potable water-certified urethane, called CIM 1061, which is chemically manufactured to eliminate the possibility of leaching into the lake and causing environmental problems. "What little got into the water stayed attached to the dam and turned into a substance like foam rubber," said

Snow. "It didn't spread into the water. When it dried and cured, we'd go down to the bottom of the dam and cut the excess off."

The crew also couldn't use the silicate medium, Black Beauty, made from steel slag, for sandblasting because of its potentially harmful environmental effects. Instead, they used actual coarse sand that broke up into a fine, powdery dust under pressure and would cause no harm to the mountain stream-fed lake if some got washed in.

Are We Having Fun Yet?

With slipping and sliding men, a gravity-bound coating, smoke, fire, fish, and other factors to worry about, the TRS crew encountered more than their share of challenges during the six weeks it took to complete the project. The sandblasting and hand-grinding of the asphalt was a tedious process. Once the CIM consultants figured out how to apply the urethane in a uniform fashion, the actual coating process went pretty smoothly, allowing Snow to relax some.

They solved the gravity issue by using gravity in their favor. Using a five-gallon container, they mixed the pre-measured CIM 1061 in batches, and allowed for a three- to four-and-

a-half-minute induction time, depending on temperature and time of day. When it was cured, said Snow, one worker poured out half of the mixture in the bucket onto the top of the dam and let it start sliding down, as had happened with the original spraying method. But instead of allowing it to converge at the bottom, two workers wielding thick-looped, carpet-nap Shure-line roller pads pushed the urethane back up the incline of the dam. Snow and his crew got an even application and an efficient use of product.

Snow estimated that they got about 17 square feet of coverage per gallon of CIM 1061. "We would have had to spray three times as much to get 60 mils at the top," he said. "We ended up with 60 to 65 mils at the top, and 70 to 75 mils at the bottom. We didn't waste any product." The crew worked in 15-foot vertical increments, starting at the top and working their way down the face of the dam.

He added, "Getting the timing down was tricky. But once we got it down, we found we could put on five gallons every 10 minutes, or about 60 buckets per day. We had a whole semi-truck full of buckets."

As the job progressed and supplies of additional spreading equipment became necessary, the nearby town of Durango, filled with tourist shops, offered little in the way of resources for coatings applicators.

"I had to make four or five trips to Farmington, New Mexico, which is 45 miles away," said Snow. "They at least had a Home Depot and a Sherwin-Williams industrial store. In Durango, I could only find four or five pairs of rubber gloves in a small Sherwin-Williams store, and we needed a lot more because our guys had to change gloves quite often." TRS also shipped some supplies to the site, like the Tyvek suits worn by crew members to prevent skin and clothing contact with CIM. Because the dam face was too slick for the suit's booties, Snow said they had to cut the booties off and duct-tape the suit legs

to their rubber-soled shoes.

"CIM 1061 can be nasty," Snow added. "If you get it on yourself, it's real hard to get off. WD-40 works well, and you can use mineral spirits, but that can burn your skin, whereas WD-40 doesn't."

Having fine tuned their gravity-driven dam coating system, the company is ready and willing to stage a return engagement. TRS President Bill Platts said that his crew plans to revisit the Terminal Dam this spring to prep and coat the bottom 18 feet, which were submerged during the initial phase of coating last summer. The lake's level is lowest in early spring, before the winter snow runoff, making the entire dam accessible. "Once completed, the dam will be set to do its job for another couple of decades," said Platts.

It's all in a day's work for Ken Snow and his crew, who look forward to the unique circumstances presented by each new project.

"We get lots of challenging jobs," he said, smiling. "That's one thing that makes this job so interesting – it's the fun of overcoming challenges." CP

JOB at a GLANCE

PROJECT:
Terminal Dam on Electra Lake
North of Durango, Colorado

COATINGS CONTRACTOR:
TRS, Inc.
1288 Meadowlark Drive
Boulder, CO 80303
(877) 472-5501
www.trsync.us

SIZE OF CONTRACTOR:
25 employees

PRIME CLIENT:
Xcel Energy

SUBSTRATE:
Asphalt

SIZE:
21,000 square feet

DURATION:
Six weeks

SUBSTRATE CONDITION:
Deteriorated 25-year-old CIM coating over asphalt. Moisture content created some outgassing that blistered new CIM coat.

UNUSUAL FACTORS:
45-degree slope on dam face. Fish in lake needed to be protected. Forest fire nearby created smoky conditions and constant possibility of evacuation. Shortage of equipment suppliers nearby.

MATERIALS / PROCESS:

- Apply hoist attachment to secure workers on incline.
- Sandblast asphalt and hand-scrape remaining rough spots with wire wheel grinder.
- Apply CIM 1061 from 5-gallon buckets using thick-looped, carpet-nap roller pads.

SAFETY CONSIDERATIONS:

- Potential of slipping on dam face into lake below necessitated harnesses, lanyards, and hoist attachment to secure crew members.
- Tyvek suits needed to protect crew from CIM 1061 contact on skin and clothing.
- Ventilated hoods worn to protect from smoke fumes and sandblasting particles.
- Forest fire posed possible evacuation threat.

VENDOR TEAM

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