

New Roof on Denver Art Museum a Thing of Beauty

By Jay Thomas



It's not often that a roof is considered a work of art, but the almost-vertical roof of the uniquely shaped Frederic C. Hamilton Building in Denver, Colorado, plays an important role in the distinctive look of the Denver Art Museum. Designed by world-renowned architect Daniel Libeskind, the Hamilton building was considered to be an architectural standout when it opened in 2006 and soon became a local landmark.

There was one problem, however. Three weeks after its grand opening, the titanium roof began leaking.

"The original roof was leaking around the detail areas, and there were also problems with air movement beneath the roof," said Dr. Raymond LaTona, senior principal and vice president at engineering firm Simpson Gumpertz & Heger (SGH) of San Francisco. "As you can imagine, this was not a good scenario for a museum housing millions of dollars [worth] of artwork."

LaTona said that SGH spent several years investigating and repairing the museum's roof





until a permanent solution was decided upon in 2010. Ultimately, an adhered, 80-mil vinyl roofing membrane from Sika Sarnafil was installed atop the museum in a custom “arrow” color to simulate the look of the original titanium. “We were confident it would be an appropriate system for this application,” LaTona remarked.

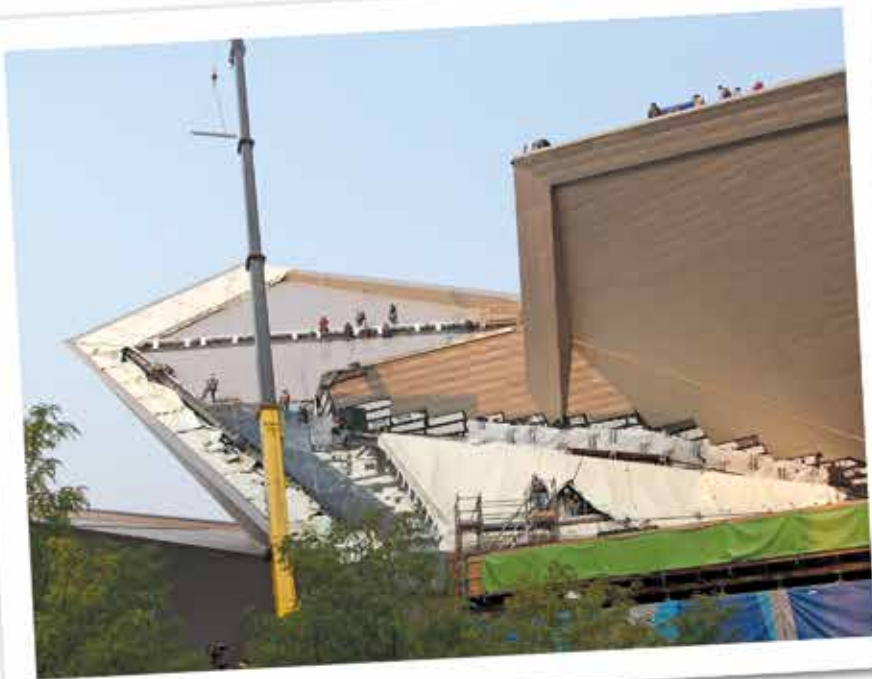
roof with a 10/12 and 6/12 pitch—a roof so steep that “it was more like a wall than a roof,” said Rich Rutledge, former deputy director of operations at the Denver Art Museum. “We believe this was the most difficult reroof project in the history of Colorado!” remarked Tim Black, president. “We had three issues that were constantly in front of us: the crew’s safety, the public’s safety, and the crane safety. Not one thing could fall to the ground, come loose, or appear to be out of control.”

A MASTERFUL INSTALLATION

Black Roofing, Inc., of Boulder, Colorado, was selected to install the multilevel



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PREPARATION THE KEY

To prepare for this perilous installation, totaling 15,000 square feet, Black Roofing spent months and \$29,000 custom-designing and building 24-in.-wide galvanized scaffold support platforms to support 40 12-ft.-long, 24-in.-wide scaffold planks. “The preplanning stage for this was more intense than I’ve ever seen,” Black stated. “We built a mock-up of the roof in the shop and scaffolding support in our shop and did ‘live tests’ on the platforms. We only had seven months to complete this project, so we didn’t want to waste a minute once we were on the job site. The entire job took 31 men from April to October to complete.”

Despite all this advance work, there were still some problems with the safety harnesses and ropes at first. “We had problems with crossed ropes until we learned to work perpendicularly up the 10/12 slope and not cross into the next guy’s territory,” Black explained. “We also learned that sometimes six men could work more efficiently than ten men in an area.”

Alan Nedelea, project manager for Black Roofing, added that for public safety, a debris net was fabricated and installed around the perimeter “to prevent anything from falling on the people below.”

Chain-link fences and scaffolding were also used to keep the public out of potentially dangerous areas, including near the crane.

WEATHERPROOFING JOB SITE

Keeping the museum and its contents watertight the entire time was also a main concern. Black Roofing fabricated tarps with ropes welded to the back sides so that the crew could fold the tarps up and down the slope almost immediately if a storm was approaching. Velcro was glued to the side laps so the tarps would be instantly bonded on the vertical lap. Custom-built


tarps were used to keep three very large skylights watertight. The skylight subcontractor removed the old frames, installed new curbs, and filled in one skylight to make it smaller.

“I was constantly monitoring the weather on a computer, which was important since we had a very wet spring and summer and so had many opportunities to use our tarp system,” Nedelea said. “If it looked like rain, the crew had to cover the roof within 15 minutes or less. Fortunately, we never had a significant leak all summer.”

Despite these difficult challenges, Black Roofing did a “very good” job on the installation, according to LaTona. “Working in and around a museum comes with its own challenges because of art and security, and Black Roofing was able to work around that and was very safety-conscious,” Rutledge stated. Terri Cross, manager of protective facilities at the museum, added, “Black Roofing’s customer service is very strong, and they have proven themselves over and over to us.”

WORK OF ART SHINES AGAIN

Today, the Denver Art Museum and its patrons are once again delighting in the Hamilton building. “We’re very happy with the way the roof is performing,” Rutledge said. “I could not be any more pleased,” added Cross.

Sounds like another masterpiece. 

Jay Thomas is the vice president of marketing for the Roofing and Flooring division of Sika Corporation.

