

**FleeceBACK® RL™ TPO**  
RapidLock Membrane

## CASE STUDY

### A Complex Re-Roofing Project



#### JOB PROFILE

**PROJECT LOCATIONS:**

Federal Heights, CO

**CARLISLE APPLICATOR:**

B&M Roofing of Colorado, LLC,  
Frederick, CO

**BUILDING OWNERS:**

Pinnacle Charter School

**ROOFING SYSTEM:**

**Metal Retrofit Section:** Carlisle 115-mil, gray FleeceBACK® RapidLock (RL™) TPO, SecurShield® RL Polyiso, and Sure-Weld® TPO Contour Ribs

**Flat Roof Sections:** Carlisle 90-mil Sure-Seal® EPDM membrane adhered with Carlisle Bonding Adhesive and CAV-GRIP® III Contact Adhesive on vertical surfaces

When the roof on the Pinnacle Charter high school building needed to be redone, there was no doubt that the job would be challenging.

The 'L' shaped building, located in Federal Heights, CO, was originally built in the 1960s as a roller-skating rink and features a large and prominent standing seam metal roof over the school's main entrance, as well as extensions on either end of the main building. One is the short leg of the 'L' and the other extends directly out from the long leg of the 'L'.

B&M Roofing of Colorado, LLC, of Frederick, Colorado, was hired for the project and had already completed the school's other buildings during earlier phases of the project. B&M is an NRCA member and has been serving the greater Denver metro area and Front Range for more than 70 years. In addition, they have been recognized by Carlisle SynTec Systems with numerous awards, including the Centurion Award, ESP, Hall of Fame, and Perfection Award and Council.

"We knew from the outset that this project would be a challenge," said Todd Smith, a project specialist for B&M Roofing. "The standing seam roof is very visible from the street level and while the school wanted to retain that look, they also understood that installing a new standing seam metal roof was not in the budget."



Working with Greg Farris, owner of FRW Consult, it was clear that they had the perfect solution – install a Carlisle RapidLock system over the standing seam roof and then upgrade it with Contour Ribs to mimic the look of a metal roof. Then, for the three flat roof sections, they would remove the existing membrane and install a new 90-mil EPDM membrane.

Carlisle's RapidLock (RL) system is a revolutionary membrane attachment method that provides a fully adhered roof without the use of adhesives. RapidLock is a hook and loop attachment system powered by VELCRO® Brand Securable Solutions. The facer on the SecurShield RapidLock insulation board acts as the 'hook' while the FleeceBACK membrane acts as the 'loop,' creating the industry's first adhesive-less, fully adhered attachment system.

"We've specified lots of RapidLock," said Farris. "Anything that can be eliminated by the manufacturer, such as adhesives in this case, as well as any related workmanship issues, is critical in today's market."

In addition to being VOC- and odor-free, the system does not have any temperature restrictions so it can be installed anytime, and it provides excellent resistance to hail and punctures. Most importantly, the system is very strong.

"Once the membrane is mated to the insulation board, it's not moving," said Smith. "The system is tenacious, to say the least, and actually gets tighter with time."



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—Todd Smith

## Retrofitting the Standing Seam Metal Part of the Roof

The first step in the installation process on the 23,300-square-foot metal roof was to clear the existing standing seam roof of all dirt and debris. Once the metal roof was prepped, the B&M team began installing 1.5-inch-thick InsulFoam expanded polystyrene (EPS) insulation between the standing seams of the metal roof.

“We had fastener pull tests conducted to ensure that the existing metal roof deck would accommodate the fasteners and anticipated wind load. We needed at least 300 pounds to meet the equivalent of 90 pounds/square foot of uplift resistance,” said Smith.

The 4:12 sloped metal roof was wide open with only a few penetrations that had to be flashed, which kept the B&M team moving along. Once the flutes of the metal roof were filled, the team installed 4-foot x 8-foot sheets of ½-inch SecurShield RapidLock cover board in a staggered pattern perpendicular to the direction of the flutes.

The team mechanically attached the cover boards using 16 Carlisle InsulFast™ fasteners per board with 3-inch insulation plates in all areas of the roof – field, perimeter, and corners.

For this portion of the project, a gray 115-mil FleeceBACK TPO membrane was specified. In a traditional metal retrofit project, the membrane would be installed parallel to the eaves and up to the ridge. However, since this roof would include Carlisle’s Sure-Weld TPO Contour Ribs, the 10-foot-wide membrane was installed across the roof in sheets starting from the rake edge.

“We had to be very careful installing the membrane to get it perfectly parallel to the gable end of the building, since we covered the seams with the Contour Ribs,” said Smith.

After making sure that the surface of the SecurShield insulation was cleared of all dust and debris, the B&M team removed the release liner on the fleece membrane and very carefully aligned it

on the roof. Once put in place, they used brooms to tack it down before using a 150-lb. roller to secure it in place. The adjoining sheets were installed across the roof providing a 2-inch lap seam to accommodate the final 1.5-inch-wide heat welded seam.

The final step was installing the 10-foot-long Contour Rib profiles. The team first installed the Contour Ribs at the seam locations, starting from the ridge and working down the roof to the eaves. Next, they determined that each rib would be installed about 17 inches on center and snapped chalk lines, taking time to ensure that each was perfectly straight and aligned properly.

“Our guys really did a nice job installing the ribs,” said Smith. “This was our first installation using the Carlisle ribs, and it came out great. The guys took their time to get the layout right, and the end result speaks for itself.”

They terminated the membrane over the edge of that section of the building and installed new gutters and collection boxes for drainage.

## The Flat Roof Sections

In addition to the higher-slope metal roof section, the project included three sections of low-slope areas that totaled another 22,000 square feet.

For these areas, B&M removed the existing membrane and installed 90-mil Sure-Seal EPDM membrane.

“These sections of the roof had numerous penetrations for large air handlers, vents, and pipes,” said Smith. “Many of the units had been replaced and there were several prefabricated curbs that had to be properly flashed. In addition, each section had parapet walls with several through wall scupper drains, and the largest roof had nearly 300 feet of gas line installed, which required our team to use extreme caution when working around it.”

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For these sections of roof, the team first removed and discarded the aged membrane. The existing roof assembly included two layers of polyisocyanurate insulation, which the B&M team left in place, except for compromised, damaged, or wet areas that needed to be removed and replaced.

Once the existing insulation was cleaned of debris and the wet or damaged areas replaced, B&M installed ½-inch SecurShield HD Cover Board for a smooth and uniform substrate. The cover board was secured through the existing insulation and into the steel deck using 24 Carlisle InsulFast fasteners and 3-inch insulation plates in all roof zones.

In addition, the team installed prefabricated pipe boots around the lines to each of the air handling units, as well as to the pipe stacks on the roof.

Lastly, the membrane was rolled out and fully adhered in place using Carlisle Sure-Seal 90-8-30A Bonding Adhesive, a high-strength, solvent-based contact adhesive, which was roller applied to both the deck and the underside of the membrane, allowed to flash off, and then mated together and rolled in place.

“We used canisters of CAV-GRIP III, a low-VOC spray-applied contact adhesive, on the parapet walls and curbs,” said Smith. “The guys really like CAV-GRIP for how fast and easy it is to apply on vertical surfaces.”

In addition, the team had to line all the through wall scuppers with membrane, and then carefully flash each one. The last step was installing the fascia to the top of the parapet walls, which was shop bent at B&M’s facility.

“At the end of the day, this project had a little bit of everything. There were areas with tapered insulation, penetrations that needed flashing, vertical surfaces, tons of gas lines that we had to operate around, low-slope areas, high-slope sections, and of course the Contour Rib installation to mimic a standing seam roof,” said Smith. “Each had its own set of challenges, but our team did a wonderful job and delivered a great new roof that will last for decades.”