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## ***Beyond the Call of Duty***

*PVC Roof Stands the Test of Time*

# PVC Roof Goes Beyond the Call of Duty

## Multi-colored membrane performs for 24 years with little maintenance

BY MICHAEL RUSSO / **RSI** Associate Publisher & Editor

In a true testament to single-ply performance and excellent roofing workmanship, diversified publishing company Advanstar Communications specified a multi-colored PVC roof on its headquarters in Cleveland, OH earlier this year.

The building's original 48 mil, reinforced PVC lasted 24 years, with little or no roof maintenance required.

The roof's rather steep 4/12 pitch assured positive drainage to an internal water shedding system and certainly helped the roof maintain its watertight integrity over the years. But the system had its challenges: its high visibility profile required periodic cleaning and it was directly in the path of air traffic at Cleveland Hopkins airport, exposing the membrane to more than its fair share of jet fuel fumes and exhaust.

Let's remember that this PVC membrane was formulated and installed in 1979—the equivalent of the Stone Age in terms of single-ply roofing technology. The manufacturer must have had its formulation right, because it reportedly hasn't changed the make-up of its PVC over the last four decades. And while some non-reinforced PVCs did not perform well over the years, this reinforced membrane remained sound in spite of Cleveland's often wildly fluctuating temperatures and weather conditions.

The original roof design was so striking, in fact, that it graced the cover of the premiere issue of a well-received magazine for roofing specifiers in 1983. The architectural firm, Tufts and Wenzel of Cleveland, received accolades for the building's innovative design, but as we'll

soon see, some of its roofing decisions created challenges for the contractor that won the bid on the 2004 reroofing job.

### Experienced installer

Three manufacturer-approved contractors bid on the work, and WEATHER MARK Corp. of Solon, OH, won the contract. The company has 15 years of experience installing the supplier's PVC system, grosses about \$5 million a year

and employs 60-80 people.

The crew of eight completed the 55,000 square foot job in three months. The installation would have gone a lot quicker if not for the weather: in the first 210 days of 2004, it rained 145 days in Cleveland.

"We really got caught in a weather-related downturn over the last two years," said Roger Smith, vice president of WEATHER MARK. "We lost three



*Because of this roof's high visual profile, one small wrinkle or patch in the finished fully adhered surface would have completely ruined the effect of the multi-colored membrane, so the "lawn-roller" application had to be perfect, creating a real challenge for installers. (Photos courtesy of Sarnafil Inc., Canton, MA.)*

to four days a week on this project due to the weather. On marginal days (40% chance of rain), we couldn't tear the roof off. But if we could control the weather, then the government would get involved," he quipped.

Problems with the original roof surfaced in 2003. Some improperly heat-welded seams had opened up and some minor surface cracks appeared due to the advanced age of the membrane.

WEATHER MARK conducted an infrared scan of the roof and discovered some areas of wet insulation. (The original insulation system consisted of a 2.5-inch composite made of polyurethane with a fiberboard surface to fully adhere the membrane.)

Installers removed the wet insulation and built the system back up with polyisocyanurate insulation and GP-Gypsum's Dens Deck Prime Roof Guard cover board, which was installed with special coated fasteners and Sarnafil Profile plates. A few hundred feet of metal decking was also replaced, but generally, the underside of the roof membrane had remained dry over the years.

In terms of energy efficiency, the interior of the building features ceilings as high as 50 feet, so the approximate R-value of 15+ was deemed more than enough for this roof.

The original roof was removed and the new PVC membrane was fully adhered with 2170 adhesive using rollers. The lap seams were heat welded, making the seams as strong as the membrane itself.

Because of the roof's high visual profile, one small wrinkle or patch in the finished fully adhered surface would have completely ruined the effect of the multi-colored membrane, so the "lawn-rollered" application had to be perfect, creating a real challenge for installers.

For the same reason, 70-foot-long custom-made PVC sheets were supplied to eliminate end laps on the job.

Welding also had to be precise, as no unsightly patches were permitted for this project. Much of the credit for this work went to Project Manager Brian

Korfant and Foreman Shawn Cotter.

"With such a visual roof and a 4/12 slope, the installation needed to be done in a clean, orderly fashion," said Smith, in his typical understated manner. "One thing that really helped out was the cooperation we received from building manager Tom Sprague and assistant Kevin Icke. Much of the work was done during office hours, and I can't remember a building team that was as helpful as they were in making the process go as smoothly as possible."

The flashings were screw-applied into the existing masonry and covered with SarnaClad end caps in copper brown, which matched the roof's darkest band of color. All of the flashing work was performed by a separate team of WEATHER MARK sheet metal experts.

On one area toward the back of the building, the architect designed a row of skylights flush with the roofing surface that could have been a recipe for disaster when water flowed down and over the plexiglass. Installers flashed the area with SarnaClad metal that protects the sills of the skylights from

water penetration.

Today, the roof looks exactly like it did when first constructed in 1979, thanks to WEATHER MARK and a durable PVC membrane.

"The manufacturer has used the same formulation of membrane for the last 40 years, using a unique coating manufacturing process," said Doug Swisher, CSI, of Swisher and Associates of Ohio Inc., in Mentor. "They are the only thermoplastic membrane manufacturer that offers two different scrim—polyester and fiberglass—the latter of which gives the membrane superior dimensional stability, which is critical for adhered roofing applications."

And in Cleveland's often cold and changeable weather, that's a good feature to have in a roofing membrane.

"They also have a tremendous amount of experience with colored membranes," Swisher said. "That's important, because when you are choosing a roofing membrane for a high-profile job like this building, you need to have confidence in the membrane you are selecting." ■

## Making its mark in Cleveland

Ironically, the biggest challenge facing Cleveland-based roofing contractor WEATHER MARK Corp. over the last few years has been the weather. In the first 210 days of 2004, it rained in Cleveland 145 days.

"Billings are down, and the economy has only a little to do with it since 9/11," said Roger Smith, vice president of WEATHER MARK. "The crews that we employ know they're going to work, but we have typically lost three to four days a week due to the weather on a number of projects."

WEATHER MARK is a full-service roofing company, providing sheet metal services, liquid membrane waterproofing, TPO, EPDM, PVC, coal tar pitch, asphalt built-up, slate and tile, but only on nonresidential applications.

Smith says the demand for coal tar built-up roofing has been higher this year, and with only one supplier currently in the market, product availability has become more of an issue.

While Smith has not seen any real "product revolutions" over the last few years, he said he likes the newer EPDM seam tapes, improved hot-air welders and computerized accounting and estimating capabilities. But, "We're just trying to collect the money, and it gets worse every year," he said.

The company has been involved in a number of high-profile projects in Northeast Ohio, including a United Parcel Service (UPS) facility near Cleveland's Hopkins airport. The new roof features the well-known brown UPS logo, including such details as the ® trademark, all visible from the air.

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