TREMCO®
Commercial Sealants & Waterproofing

Location:
Cleveland, Ohio

CSU Architect/Project Manager:
Melanie Boyd, Senior Architect
Cleveland State University

Specifier/Consultant:
Bud Griffith, Construction Resources Inc. (CRI)

Contractor:
Mark McMahon

Tremco Product System:
- **Spectrem® 2 Silicone Sealant**
- **illmod 600 Pre-Compressed Polyurethane Foam Sealant**

GREENGUARD Children & Schools Indoor Air Quality Certified

Cleveland State University, Rhodes Tower

Challenge: At 21 stories high, the James A. Rhodes Tower on the campus of Cleveland State University is the second-tallest educational-purposed building in the United States. The 500,000-square-foot steel skyscraper in downtown Cleveland, Ohio houses the university's four-floor main library, academic offices and the mechanical room.

Situated right off Lake Erie, Rhodes Tower is subjected to high wind speed and driving rain. Like many buildings constructed in the early 1970s, the CSU structure was built with precast concrete walls, which offered very little insulation or protection from moisture. The building was plagued by leaks, especially from beneath the mechanical room's exterior walls and the EDPM mezzanine roof. While intermediate caulking projects on the exterior panel joints attempted to stop the water that was blowing in through deteriorated areas, leaking persisted. In addition to leaking issues, several floors were abated because of environmental concerns. Rhodes Tower was in need of a major overhaul to resolve these issues.

Plans were put in place for a comprehensive renovation of the tower. The project involved the replacement of the 20th floor mezzanine roof system and the replacement of the 20th floor's mechanical room exterior wall's panels, steel siding and louvers. Plans also included cleaning the tower's precast concrete panels and a 100% sealant replacement on all four sides of the towers, from the seventh floor up to the cooling towers at the top of the building.

Cleveland State University, Rhodes Tower*...continued*

With the goal of sealing the tower's concrete panels to withstand high winds and driving rain for the long-term, CSU architects tapped the expertise of Construction Resources Inc. (CRI), an established building exterior consulting firm known for high-performance, sustainable exterior restoration projects with a reputation for resolving especially challenging building envelope performance issues. CRI had successfully corrected problems on several other CSU building exteriors.

After analyzing Rhodes Tower, from the top roof systems to the library roof below, which forms the base of the tower, CRI identified the source of the leaking and determined the best solution. "Our goal was to give CSU a low-maintenance solution for the longest lifespan success with the best products available in the industry," said Bud Griffith, CRI president and project consultant.

Solution: Many building exterior problems require integrated product application solutions; each product must work in conjunction with other products or systems so it does not become a weak link, allowing air and moisture to enter through the building envelope. For the joint sealing restoration of the exterior panels of Rhodes Tower, CRI specified a redundant system to combat the harsh weather elements and provide a longer-lifespan weather seal.

"Due to the size of the tower, there is no easy way for CSU to maintain this building when caulk eventually begins to fail," explained Griffith.

> "I chose Tremco's illmod 600 as a back-up system to their Spectrem 2 silicone sealant to give the restoration job a prolonged productive life."

Though determining the size needed was difficult from the ground, illmod 600 is available in a variety of sizes so it was possible to mix and match the tape to fit the joints so everything was consistent throughout.

Tremco's illmod 600 self-expanding, polyurethane foam sealant provides a watertight, vapor permeable seal that withstands wind-driven rain. The tape is driving rain-resistant up to 600 Pa, the equivalent of about a 70.9 mph wind, and its vapor permeable property ensures that moisture is not trapped inside the wall.

Impregnated with a flame-retardant, modified acrylic resin, illmod 600 is easy to apply. The fire-resistant tape (flame spread of 0 per ASTM E 84) has zero VOC and is UV stable, so it's suitable for interior and exterior applications. It is ideal for parallel joints up to 1-5/8 inches wide and 2 inches deep and can fill gaps as small as 3mm wide. The tape also offers thermal protection and acoustical attributes.

Replacing caulk with caulk usually requires grinding out or cutting out the substrate to get to virgin material. With illmod 600, minimal surface preparation is required—the tape is installed in a fraction of the time that most liquid sealants require. Because it uses no chemical bonding agents, illmod 600 works well in restorations where a chemical bond could discolor or otherwise damage a substrate.

For Rhodes Tower, 40,000 linear feet of illmod 600 were specified for joint repair in the exterior panels. While the great height of the tower made it somewhat difficult for contractors to determine the tape size needed from the ground, illmod 600 is available in a variety of sizes, so contractors were able to mix and match the tape to fit the joints in a consistent manner. Tape rolls range from almost nine feet to 32 feet in length, depending on the width and thickness of the tape.

Contractors easily positioned and affixed illmod 600 to the tower's exterior joints by pressing the pressure-sensitive adhesive side in place from one-fourth to one-half inch deep. Once the tape was positioned, the material self-expanded to fill the joints and seal small imperfections, forming a

The illmod 600 is pressed in place from one-fourth to one-half inch deep and expands to fill the joint, sealing small imperfections.

permanently elastic, weather-tight seal. There was no wait for the material to cure in cold weather, and rain wasn't an issue because illmod 600 doesn't need a dry surface. The time it takes for the tape to fully expand depends on the temperature: at 37°F, full expansion takes five hours; at 68°F, it takes eight minutes; and at 104°F, it fully expands in one minute.

Once the illmod 600 had fully expanded, Tremco's Spectrem® 2 Silicone Sealant was applied over it to eliminate any deficiencies that could compromise the building envelope by allowing air and moisture to enter. There is no need for primer over the illmod 600 tape. A medium modulus, one-part, high-performance, neutral cure silicone sealant, Spectrem 2 is used in a variety of caulking and glazing applications. Because it is formulated to ensure weather-tight connectivity, it is particularly appropriate as a weather seal and tensile bead in two-sided structural glazing systems.

Both illmod 600 and Spectrem 2 Silicone Sealant have been rigorously tested by the GREENGUARD Environmental Institute and earned its indoor air quality (IAQ) certification to the stringent Children and Schools™ standard. GREENGUARD Children and Schools Certification is globally recognized

Cleveland State University, Rhodes Tower*...continued*

as meeting or exceeding all IAQ standards and is significantly stricter than methods mandated in most building codes and systems. It gives assurance that products affecting indoor spaces meet rigorous volatile organic emissions (VOE) limits, which contribute to healthier interiors.

To ensure performance and quality, the high-performance sealant system was first tested using the ASTM tab adhesion field test. This ensured that the sealant was adhering and performing properly. The test was performed on every lift of the building which also allowed for review of the installation of the illmod 600.

CSU now has high-performing exterior wall panels on Rhodes Tower that can withstand the harsh weather systems associated with Lake Erie. Since the restoration of the tower was completed, there have been no reports of leaking from the exterior panels. CRI's Griffith is confident that the dual system will provide an added level of protection for years beyond traditional systems.

> "I've continued to use illmod 600 in conjunction with Spectrem Silicone Sealants on other large projects because of what I consider the success we've had with CSU," said Griffith.

One of these projects includes the renovation of a 173-bed, hospital. The assurance provided by the addition of this expanding foam sealant, which fills the gaps and voids and eliminates any concern over application inconsistencies, adds tremendous value to restoration joint sealing projects. The addition of the thermal and acoustical benefits is just icing on the cake.

Spectrem 2 Silicone Sealant was applied over the illmod 600 for a weathertight system with increased assurance of prolonged productive life plus thermal and acoustical benefits.

Adhesion testing was performed on every lift of the building, which also allowed for review of the illmod 600 installation.

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