CASE STUDY: MAYFAIR RENAISSANCE CONDO

Phase two of Atlanta condo sealed with silicones after ten years' service in first tower

Project

Architects and consultants for the Mayfair Renaissance Condo tower in Atlanta wanted to identify the optimum weathersealing system for window glazing and for expansion joints in EIFS panels. All sealing materials were required to withstand rigorous laboratory evaluations and on-site testing prior to construction to ensure weatherproofing performance.

Products

- DOWSIL™ 790 Silicone Building Sealant
- DOWSIL™ 795 Silicone Building Sealant
- DOWSIL™ 123 Silicone Seal
- DOWSIL™ AllGuard Silicone Elastomeric Coating

Silicone sealants and extruded silicone seals are key weatherproofing components in the new 35-story Mayfair Renaissance Condo project in Atlanta, Georgia, the second phase of a twin high-rise structure designed by Smallwood, Reynolds, Stewart & Stewart. The same two joint sealants were used on the original pre-cast concrete tower, originally constructed as apartments in 1989. The two silicone formulations have proven so successful in preventing water intrusion that they were also specified for the newly completed structure, which is built with pre-fabricated EIFS panels.

Designed with outstanding weather resistance as a top priority, sealing the Mayfair Renaissance tower was a complex task. Despite excellent performance in the first tower, the architects wanted to be certain that each component demonstrated superior performance, and extensive testing was conducted at Construction Research Laboratories in Miami.

Testing

"The window and curtainwall systems were rigorously tested for water and air infiltration," commented Matt Waddell of Hardin Construction, general contractor on the Phase Two project. "The sealants, windows and other components were even subjected to simulations of a 120-mph hurricane-force wind in a special chamber to confirm their weatherproofing performance."

According to Jim Warbrouck at Curtainwall Design Consultants, exterior wall consultant to the building owner, a pre-construction mock-up was also used on-site to confirm structural and weatherproofing performance. "A test section was constructed, about 40 feet wide and approximately two stories high," said Warbrouck. "The contractor built a section of the actual exterior as it was designed," he said, "so it would be subjected to the same structural loading as the completed tower. Then we tested for air and water penetration to ensure that it would remain weathertight. The silicone sealants demonstrated excellent adhesion and durability," he added.

Materials

Expansion joints between the EIFS panels at the Mayfair Renaissance were sealed with DOWSIL™ 790 Silicone Building Sealant, an ultra-low modulus, high-elongation material designed to deliver adhesion to a wide range of substrates, including masonry, stone, concrete, wood, steel, aluminum and plastics. The material's very low modulus was a key feature in the new design, to avoid stressing the EIFS panels at the bond line. Its outstanding flexibility allows the sealant to absorb building movement, thermal expansion and other stresses.

"The first tower demonstrated the performance of DOWSIL™ 790 Sealant between sections of pre-cast concrete, and in the second phase we specified the same product as the primary weatherseal between EIFS panels," explained Bill Reynolds of Smallwood, Reynolds, et al. "As the testing verified, the adhesion, UV resistance and flexibility of the silicone material help us design a very durable, waterproof exterior that will withstand many years of severe weather conditions."

For adhesion to metal window frames, Reynolds and his team specified DOWSIL™ 795 Silicone Building Sealant, a high-performance structural glazing and weathersealing formulation developed for use on glass, anodized and coated aluminum, steel and granite, as well as concrete, brick and a number of plastics. The new Mayfair Renaissance tower has approximately 900 windows in its 296 units, along with nearly 600 sets of French doors for balcony access, all sealed with the same sealant that proved its capabilities in the 315 units of the first phase. Mike Strickland of Metro Waterproofing estimated that his firm applied a total of 2000 gallons of the two silicone sealants on the new tower.

In addition to the two silicone sealants, weatherproofing of the new tower included a secondary seal between the horizontal EIFS expansion joints. "The preformed design of the EIFS assembly includes an additional safeguard that incorporates DOWSIL™ 123 Silicone Seal," explained building exterior consultant Steve Gleason of Williamson and Associates. "That extruded seal acts as a gasket, so if water somehow migrates behind the primary seal, the preformed barrier of DOWSIL™ 123 would prevent it from traveling from floor to floor," he said.

According to the architects, other critical elements to the sealant specification process were supplier-related. "We wanted a single-point supplier who could handle all the waterproofing needs," said specifications writer Nancy Monroe from Smallwood, Reynolds. "The project also required that both sealants be supplied in custom colors to precisely match the color scheme of the two buildings. We were able to meet all of these objectives with the DOWSIL™ materials, and the company provided excellent local support throughout the construction process," she added.

Metro also protected exposed concrete at the roof level with DOWSIL™ AllGuard Silicone Elastomeric Coating to provide an additional measure of weatherproofing to the upper section of the tower.

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