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RESTORING AN ICONIC PART OF THE FORT LAUDERDALE SKYLINE:

BROWARD FINANCIAL CENTRE, A TRINITY AWARD WINNER

RESTORING AN ICONIC PART OF THE FORT LAUDERDALE SKYLINE:

BROWARD FINANCIAL CENTRE, A 2022 TRINITY AWARD WINNER

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The Broward Financial Centre is a 325,492 square foot 24-story Class A office building with large flanking six-story parking garage structures located in the Central Business District of Fort Lauderdale, Florida. The office building recently underwent façade sealant repairs to address water leakage and related coating repairs and earned the Trinity Award for the "Sealant" category in 2022. The iconic building was constructed in approximately 1986 and has an architecturally unique stepped "wedding cake" design that helps define the Fort Lauderdale skyline. This detailed repair project required consistent and positive collaboration among the project team, which included SWR Institute architect/engineer, contractor, and manufacturer members as well as a proactive owner's representative.

Overall view of Broward Financial Centre façade.

BUILDING DESCRIPTION

The exterior walls of the Broward Financial Centre are clad with a curtain wall glazing system and white panels. The façade white panels include opaque/coated glass panels and aluminum composite material (ACM) panels. The coated glass panels and ACM panels are difficult to differentiate visually without removing the joint sealant in between panels to reveal the black plastic core of the ACM panels. Decorative, blue-painted horizontal aluminum channels are installed at curtain wall heads, between the curtain wall glazing and the white panels. The glazing, white panels, and blue channels are installed in a repeating pattern of horizontal ribbons.

The building design includes large terrace roof areas at setbacks that were covered with Thermoplastic Polyolefin (TPO) roofing and a custom bronze colored coping with a white handrail was installed over the tops of the parapet walls at terraces.

BACKGROUND AND REPAIR PROJECT INITIATION

In 2005, approximately 19 years after construction, Hurricane Wilma destroyed a significant number of curtain wall glazing lites and façade panels on the Broward Financial Centre façade. Historic photographs of the building damage were showcased in the news. Repairs by others following the hurricane included replacing original opaque/coated glass panels with aluminum composite material (ACM) panels. While the ACM panels allowed the building to return to a serviceable condition, they later played a challenging role in the subject repair project.

Over time, the building began to experience water leakage through the façade. In 2019 the owner engaged Wiss, Janney, Elstner Associates, Inc. (WJE) to perform a water leakage investigation to identify the root causes of the leaks. WJE's water leakage investigation revealed that the curtain wall glazing joints, façade panel joints and terrace parapet walls were nearing the end of their useful life and were in need of

Exterior walls are clad with a curtain wall glazing system and white panels.

Custom bronze colored coping with a white handrail at terrace parapet wall.

Left and Below: Damage from Hurricane Wilma in 2005.

> "In 2005, approximately 19 years after construction, Hurricane Wilma destroyed a significant number of curtain wall glazing lites and façade panels …"

Existing sealant failures at ACM panel joint.

resealing. WJE designed repairs to the exterior façade, which included application of coatings, replacement of sealant joints, adding preformed silicone extrusions over joinery, and new parapet wall copings. Together, with Western Specialty Contractors of America (Western) and Dow Silicones, the repairs took place from August 2020 through May 2021.

TECHNICAL CHALLENGES

The design and construction of the sealant and coating repairs presented many opportunities to problem-solve technical and logistical challenges. The ACM panels that were installed following Hurricane Wilma had plastic cores exposed at the perimeter of the panels, which did not allow for sealant bond if traditional hourglass-shaped sealant joints had been installed within the panel joints. Existing sealant bond failures were prevalent at ACM panel locations. Due to the panel edge condition and lack of proper bond surface to the metal, the design of the repairs included preformed silicone extrusions over the existing panel sealant joints. Not only did the

Sealant failure and blue coating chalking at a façade channel feature.

Blue coating chalking at a façade channel feature.

Blue coating chalking from a façade channel feature on ACM panel.

Custom parapet wall coping was found to be a significant source of water intrusion during the investigation due to the unique configuration, which included recesses for handrail bracket channels.

preformed silicone extrusions represent a durable long-term solution, but they allowed the existing sealant to remain in situ, which reduced repair costs and limited water intrusion during the repair work.

Prior to the repairs, the existing blue coating on the exposed aluminum channels at the head of the curtain wall assembly was chalking and running down the façade. The chalking coating was found to limit the bond of the new sealant and the painted substrate and required removal in order to create a suitable substrate for the sealant repairs. Although this condition was not originally anticipated, the owner team elected to install a new blue high-performance coating on the channels prior to resealing after the project team educated them on the impact the chalking paint would have on the durability of the sealant repairs.

The decorative, custom parapet wall coping was found to be a significant source of water intrusion during the initial investigation. This was due to the unique configuration, which included recesses in the top of the coping for handrail bracket channels that were difficult to seal and maintain. The owner was presented with several options, which included restoring and resealing the original copings and installing new copings. The owner elected to install new parapet wall copings; however, this necessitated that the parapet wall height be increased after removal of the original custom handrails so that the parapet walls continued to function as guard rails. The original parapet walls were raised by leaving a portion of the existing coping in place and using it as a substrate to fasten the wood blocking to for the new coping system.

SOLUTIONS

The goal of the project team was to develop a long-term and cost-effective solution addressing the water infiltration issues throughout the building. The knowledge of the project team was instrumental in developing this cost-effective solution and following through with repairs in a timely manner. Repairs included:

- Installation of sealant and preformed silicone extrusions over the glazing, curtain wall joints, and ACM/glass panel joints. To achieve durable sealant butt joints at the perimeter of the ACM/glass panel joints, the ACM

Overall view of Broward Financial Centre façade.

panels would have required replacement. To save cost, the team chose to leave the existing ACM panels in place and preformed silicone extrusions were installed over the joints.

- Removal of the existing blue coating on the aluminum channels and recoating with a new high-performance coating. Through trials, the project team chose to implement chemical paint stripping to remove the chalking blue paint in lieu of mechanical abrasion. This methodology ultimately saved cost, eliminated damage to adjacent materials, and lessened disruption to building occupants and the public, which could have occurred due to the high activity and windy conditions of the downtown area.
- Removal of the existing handrails and brackets on the building parapet walls and installation of new wood blocking and prefabricated sheet metal coping over existing coping. New parapet copings (capable of meeting Florida's progressive high wind load structural requirements) were installed on top of the existing custom coping by removing the rail and leaving the coping in situ. Following analysis, the existing custom copings were allowed to remain in situ, serving as a substrate for the new copings and maintaining the building in a watertight condition during construction. The new coping system simplified the waterproofing/sealing for ease of future maintenance.
- Preparation and recoating of existing copings and railings on the parking garage parapet walls.
- Installation of new TPO roofing over aluminum-faced plywood panels at the inner faces of parapet walls.

COMMUNITY/ENVIRONMENTAL IMPACT

The repairs were designed to have minimal impact on the community and environment. Some initial considerations by the ownership included the complete replacement of the existing windows to address the water infiltration. Considering cost and disruption, WJE provided repair approaches for owner consideration, including leaving the existing windows in place, creating a surface-sealed barrier system, and installing preformed silicone extrusions over the joints. By repairing the existing building components in place, a negligible amount of waste product was generated thus limiting landfill waste, a significant energy reduction was realized by not producing a new curtain wall system with metal and glass, and the building occupants were not displaced during the project. The preformed silicone extrusions replicated the general aesthetics of the existing building while providing a clean appearance with a new blue high-performance coating on the façade accent channels. The unique building architecture was preserved

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Façade repairs in progress.

through these repairs and even improved from the owner's perspective, despite initial reservations.

QUALITY CONTROL/FIELD TESTING

Prior to the initiation of repairs, two-story tall mock-ups were implemented to review Western's installation practices and quality control and also for the ownership to understand the design intent and final appearance of the repairs. Field adhesion testing of the new blue high-performance coating and sealant was performed to review performance periodically throughout the project. WJE was on-site to perform quality assurance testing and review ongoing and completed repairs at least once each week; however, Western implemented its own quality control program to ensure the coating and sealant application went smoothly. WJE and Western established a productive working relationship throughout the project with an emphasis on regular communication and timely responses. This close communication allowed the contractor to successfully execute the design intent with little uncertainty. During each WJE site inspection, Western sent staff responsible for the work on that area of the building to ride on the suspended scaffolding and understand the types of issues the architect/engineer was recording and asking to be modified. The process promoted a sense of ownership for each worker and improved the overall quality of the project. At the conclusion of each suspended scaffolding drop and the close of the project, WJE and Western developed punch lists concurrently. The number of items on the punch lists steadily decreased throughout the project, resulting in very few items to be corrected and the project remaining on schedule.

CONCLUSION

The repair solutions on this project addressed some technically challenging details all while respecting the modern and unique building architecture. This project showcased consistent and positive collaboration among the team, which included the owner, architect/engineer, contractor, and manufacturers. Site quality control testing led the project team's priorities and, as such, provided ownership with a cost-effective long-term repair solution.

Façade repairs in progress.

Façade repairs in progress.

"WJE and Western established a productive working relationship throughout the project with an emphasis on regular communication and timely responses."

Despite the technical challenges, the repairs were completed while minimizing the construction impacts on the community and environment. The project was completed for an estimated $1.83 million in approximately 270 days between August 2020 and May 2021.

About the Author

Karen Zimnicki joined WJE in 2015 and specializes in field evaluation, testing and repair design to address nonperforming building issues, moisture problems, and associated material distress. Her experience encompasses investigation of water leakage and deteriorating building materials, repair design, construction contract administration, and litigation consulting.

Ms. Zimnicki has investigated many construction systems and materials such as curtain walls, concrete, masonry, steel, waterproofing, roofing, wood cladding, and EIFS systems. Her expertise includes standardized and diagnostic field and laboratory testing, with an emphasis on air and water infiltration, exterior wall materials, roofing, and waterproofing systems.