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WSP

NEW SOLUTION TO A COMMON PROBLEM:

INNOVATIVE STRATEGY TO TRANSFORM AGING BUILDING FAÇADES

Using a unique recladding program, the 50-year-old façade of The Simpson Tower in downtown Toronto, home to the headquarters of Hudson's Bay Company, will reveal a completed, glimmering new building envelope.

The transformation is already well underway at the corner of Bay Street and Queen Street. The building's new glass panels are already being installed – and onlookers this year and next will continue to curiously watch as the tower's exterior transforms from aging to high-performing -- from old to contemporary – equally rivalling any of its newly-built sky-scraper counterparts in efficiency as well as aesthetic.

Completed in 1968 for Simpsons department store, the building was designed by architect John B. Parkin. Ten years later it was sold to Hudson's Bay Company (HBC) and then eventually purchased by Cadillac Fairview in 2014.

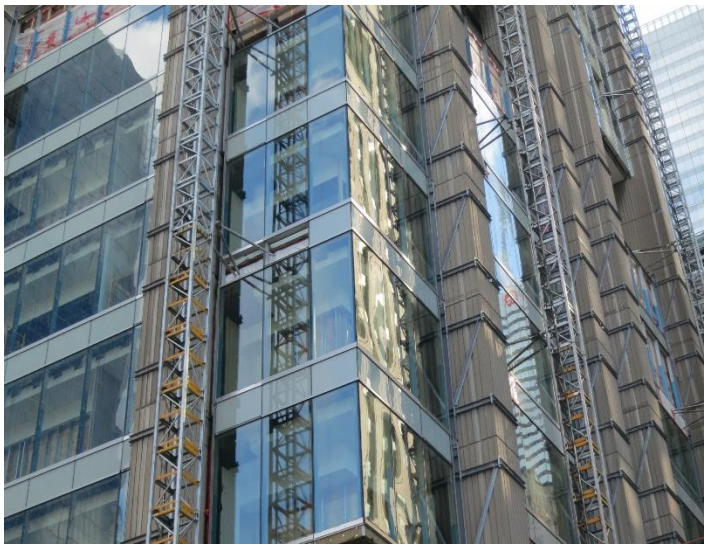
The Challenge: Deteriorating Precast Cladding

In 2013, the owners engaged WSP to perform a condition assessment of the precast cladding of The Simpson Tower, now referred to as 401 Bay. Following an extensive study, several management strategies for the precast cladding were presented ranging from restoration as a minimum, to the extreme case of overcladding or recladding. The latter options were intended to renew the façade and minimize maintenance and repair of the existing cladding. A significant concern for the client in addition to life-cycle costs was the impact on building operation and occupants.

The Solution: Overcladding

After reviewing the cost/risk implications of each option and considering impact to existing tenants, the owners chose to overclad. By externally securing the precast panels and installing new cladding outboard of the existing cladding, minimal interior work would be necessary providing less impact to the existing tenants. Renewing the façade by overcladding the building with a new curtain wall system also provided the owners with several positive impacts by:

- Renewing the overall life of the exterior envelope
- Updating the architectural look of the building using more modern materials and technologies;
- Greatly improving the thermal performance of the building, which in turn saves on energy costs; and,
- Upgrading the building to allow the owners to attract and maintain high quality tenants



The Innovation: A Unique Way to Overclad

One of the most interesting aspects of this project is the creative use of reinforcing technology. WSP worked with CINTEC Reinforcing System to create a custom solution using their proprietary reinforcing system. Both firms analyzed potential solutions and developed a unique, project-specific anchoring system that was able to withstand testing and application. The CINTEC system involves installing a high strength steel anchor, which is carefully fabricated with a fabric sleeve, in an oversized core through the façade and into the building substructure, and then injecting under low pressure a specially developed, proprietary cementitious grout. In the case of 401 Bay, the system was able to be used to re-anchor the precast concrete panels (as a result of deteriorating connections) while providing anchor points for the new metal and glass curtain wall.

By using this innovative approach, the project is moving along successfully without significant tenant disruption that would occur with an alternative re-cladding approach.

The Outcome: Improved Thermal Performance, Enhanced Look, Renewed Life

The reinforcement anchoring system and the new curtain wall has been tested throughout the construction period to ensure the system is working as intended. The design team worked with the construction manager to ensure all parties were clear on the required steps to make this a successful project. Because of the well-thought out design, testing, and effective team coordination, the outcome will be the appearance of a brand new modern building while significantly improving the thermal performance of the cladding and renewing the life of the exterior envelope.

An Advanced Solution for a Common Issue

Given the age and type of construction of many buildings built over 40 years ago, this is anticipated to be a relatively common issue for building owners in the future. Extending the life of aging buildings and reinvigorating the appearance to reposition assets is very valuable to building owners. This method is a sustainable approach to preserve property and keep it in good working condition, not only on the exterior, but also the interior of the building. The example of 401 Bay offers a unique engineering solution addressing the challenges with renewing these building stocks.

Project name: *Recladding 401 Bay Street, Toronto*

Owners: *Cadillac Fairview, Hudson's Bay Company*

Structural Engineer: *WSP (Mark Campbell, P.Eng.)*

Façade Engineers: *WSP (Hamid Vossoughi, P.Eng., Andrea Yee, B.Sc.E.)*

Architect: *John B. Parkin (original), Highland Associates (façade renewal)*

Construction Manager: *D.F. Pray*

Other Key Player: *WZMH Architects (construction administration)*