2020 Canadian Consulting Engineering Award

120 & 130 ADELAIDE ST WEST TORONTO – RE-CLADDING

Buildings Category

wsp

ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA

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Close-up Rendering of Renewed Façade

PROJECT OUTLINE

The re-cladding project at 120 & 130 Adelaide Street West is transformative.

Completed on two fully-occupied commercial office buildings, the result provides a higher performing envelope with a renewed aesthetic and demonstrates Oxford's commitment to excellence in real estate development, tenant services, and sustainability. The project demonstrates how a successful re-cladding project can be completed on two fully-occupied buildings in a tight urban context with limited occupant disruption.

Herein we provide a project review and reasons why this project is well-suited for the 52nd Annual CCE Awards.

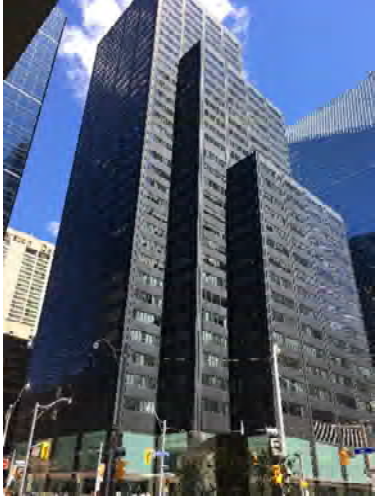
The following are key project features:

- Highly technical approach to whole-building re-cladding
- Sustainability focus with attention to building re-use, occupant comfort, and energy reduction
- Visually striking aesthetic to weave together existing assets with adjacent new development
- Innovative contracting solution to permit bespoke and financially acceptable solutions
- Financial success for the Owner

On behalf of the project team, we are confident we have presented a compelling presentation and look forward to your positive response.

WSP WZMH OXFORD FLYNN FLYNN GROUP OF COMPANIES


Time-lapse images – 120 Adelaide St W




Time-lapse images – 130 Adelaide St W

TECHNICAL RESPONSE

INNOVATION

120 & 130 Adelaide Street West are part of the 5-building, 2.3 million square foot Richmond Adelaide Centre (RAC) Owned by Oxford Properties Group.

In response to a 2012 cladding report that identified general deterioration of the façade, the design and technical team of WZMH and WSP analysed various repair and replacement strategies to determine whether full re-cladding was preferred over a traditional maintenance or selective replacement approach. Once the re-cladding direction was determined, the team developed design iterations in response to as-built conditions to provide a technically-viable approach for installing pre-glazed vision and spandrel units into the existing curtain wall framing. The process included extensive investigations, structural analysis, modeling, architectural renderings, and on-site mock-ups to demonstrate aesthetic outcomes and construction logistics.

Drawings and specifications were tendered to design-build contractors for implementation, which permitted freedom by the bidders to develop their own technical solution that met the performance and aesthetic requirements without being locked-in to a specific approach.

The design-build solution by Flynn uses aluminum cassette frames pre-assembled with glazed vision units and spandrel panels connected to the existing frames with toggle plates, flexible membranes, and sealants to accommodate existing building tolerances while maintaining air and water tightness. The demolition and cassette installation sequencing was optimized to minimize tenant disruption, protect interior areas, and facilitate future localized replacement.

Project challenges included the practicality and sensitivity of working on two fully-occupied commercial towers in a busy city core, with limited mobilization space and restrictive noise constraints. The contractor and Owner agreed to a 24-hour (three 8-hour shifts), 5-day-a-week construction schedule with noisy worked scheduled during evening and overnight shifts.

The construction methodology and site access plan ID-based security measures to restrict access to work areas presented several creative solutions including:

- Mast climbers to optimize crew size and material capacity while eliminating plaza deck loading
- Full-deck overhead protection with wide building access paths, lighting, and signage
- Weather-protected work platforms
- Material hoist for material used during temporary nighttime lane closures, eliminating traffic disruption
- Low-impact hand tools to minimize noise disruption

Combined, these innovative strategies helped the Owner deliver the project within a tight timeline on fully-occupied buildings with minimal disruption to building occupants, neighbouring properties, and traffic.


Time-lapse images – 120 Adelaide St W


Time-lapse images – 130 Adelaide St W

COMPLEXITY

The complexity of installing a new system within an existing curtain wall assembly required specific and measured actions to ensure quality. These measures included:

- In-situ design stage mock-ups: performed on the building to test the fit and finish of a re-cladding concept. This solved the challenges of visually reviewing glass, sealant, and gasket size, colour, and system configuration.
- Laboratory performance mock-ups: conducted during the design-build stage to measure performance of the new system once integrated into the existing curtain wall system, including replicating the as-built condition.
- In-situ performance mock-ups: conducted at key stages throughout the project to continually validate performance against project objectives.
- Manufacturing and fabrication quality: monitored continually by the design-builder and selectively by the consultant team to ensure the project requirements were met. Glass was procured from North America and Europe and these facilities were included in the quality monitoring process. Cassette frames were manufactured locally in the Greater Toronto Area under continuous monitoring by the design-builder and selective review by the consultant team.
- Site installation: continually monitored by the design-builder and periodically reviewed by the consultant team. Coordinating review during installation required careful collaboration to ensure production rates were not affected by altering scheduled movement of the mast climbers and associated work crews.

The new façade at Richmond Adelaide Centre accomplished several quality and functionality benchmarks such as improved daylighting, reduced solar heat gain, and better thermal efficiency (further details under Environment Benefits).

SOCIAL AND ECONOMIC BENEFITS

North American urban centres contain hundreds of mid-20th century mid- and high-rise buildings, many of which have cladding systems approaching the end of their design service life. With nearly 11M sq. ft. of commercial office under construction in Toronto (Altus Group, GTA 2020 Flash Report), these existing assets will face increased competition– aesthetically and on performance-based metrics – from new assets. Many building owners rely on selective or phased replacement to address façade deterioration; however, this approach often results in sub-par performance and appearance, providing little improvement to asset value, energy efficiency, or comfort.

The North American construction market is very familiar with the design-build approach for new construction; however, examples of design-build in the façade renewal market are rare. Our team developed a series of performance and aesthetic metrics to permit design-build contractors flexibility in developing their own unique solution. The process resulted in considerable cost and schedule savings compared to the traditional design and tender or construction management approach.


Time-lapse images – 120 Adelaide St W


Time-lapse images – 130 Adelaide St W

This project demonstrates the market's ability to deliver complex façade renewal on fully occupied buildings in a dense urban environment; the industry's ability to design and install unique, custom solutions on a large scale; the possibilities for modifying significantly the aesthetics and performance of existing buildings, and; the financial benefit to owners of embarking on large scale renewal.

In short: this project is transformative.

ENVIRONMENTAL BENEFITS

At Oxford, sustainability is about being a responsible corporate citizen. It is about setting goals, and sweating the details in-between. It's also about leadership, transparency, and engagement, and doing our part to make the world a better place. We seek to operate our buildings as efficiently as possible and to conserve natural resources.

120 and 130 Adelaide Street West are both Class A LEED Gold-certified buildings located in the northwest section of the Financial Core. Oxford recognized that the re-cladding presented an opportunity to contribute to reaching their sustainability targets by including improving the energy performance and comfort of nearly 1M sq. ft. of commercial office space in the Toronto core.

The glazing systems were designed to improve thermal performance, reduce air leakage, and improve moisture management within the façade. The moisture management system and air barrier includes the use of flexible through-wall membranes and sealant to transition between the new cassette design and the existing curtain wall framing while maintaining a drained and vented rain screen cavity design.

System improvements are approximately as follows:

130 Adelaide St W

- 50% improvement in vision glazing thermal performance
- 60% improvement in opaque spandrel thermal performance
- 50% reduction in solar heat gain

120 Adelaide St W

- 30% improvement in vision glazing thermal performance
- 40% improvement in opaque spandrel thermal performance
- 20% reduction in solar heat gain

These improvements demonstrate the ability to achieve meaningful change with existing, fully-occupied buildings.

Time-lapse images – 120 Adelaide St W

Time-lapse images – 130 Adelaide St W

MEETING CLIENT'S NEEDS

At the project outset, 120 Adelaide St W at 427,00 sq. ft. had approximately 30% vacancy; 130 Adelaide St W at 605,000 sq. ft. had approximately 2% vacancy. Initial estimates for re-cladding compared to repair of the existing façade presented a variance of around $30M. Oxford then assembled a business case to explore options for offsetting this incremental investment increase.

Oxford recognized that there was considerable value in re-cladding as a means of improving the overall quality of the block in general and repositioning these assets in particular. The team anticipated that a re-cladding project could:

- Enhance the curb appeal, leasing success, and competitive position as new supply is added to the market
- Replace aging infrastructure nearing the end of its useful life with a superior product
- Enhance customer comfort and improve energy performance
- Maximize returns by proactively investing capital in their core assets
- Improve asset returns and fortify the asset

Oxford's team analysed four variables to justify the additional investment:

- higher rents to cover the incremental spend
- shorter lease-up time
- higher stabilized occupancy
- lower cap rate

With the leasing team on board, the project moved forward. Oxford is pleased to report that the financial metrics were achieved, beyond expectations, including some early lease renewals even prior to construction starting.

All told, the project was delivered within budget, with minor schedule adjustments, and minimal tenant disruption. The project is highly successful.

Project Images

120 Adelaide Street West

130 Adelaide Street West