

# Mid-Century Modern Heritage Conservation

By Mike Grummett, PEng



*Figure 1. Westcoast Transmission Building circa 1970. Photograph courtesy of UBC Library—Rare Collections.*

*Figure 2. The Westcoast Transmission Building was a prominent landmark at the time of construction. Photograph courtesy of UBC Library—Rare Collections.*



**T**he Qube in Vancouver, BC, is a historic site listed on the Canadian Register of Historic Places.<sup>1</sup> Currently a condominium building, the 12-story mid-century modern structure was designed by the architecture firm of Rhone and Iredale, with Bogue Babicki as structural engineer, and constructed in 1968 and 1969 to serve as corporate headquarters for the Westcoast Transmission Company Ltd.<sup>1,2</sup>

Formerly known as the Westcoast Transmission Building (Fig. 1 and 2), the Qube is distinguished by its modernist aesthetic and the unique cable-suspension system of construction, which was designed to meet the locale's seismic requirements. The system suspends six bundles of two steel cables each across the top of the central concrete core to support the floor structure's perimeter and remove the need for intermediate columns. Along with the cable system and concrete core, the glazed curtainwall featuring spandrel and dark-colored glass is an architecturally significant design element noted in the Canadian Register. The building is one of Vancouver's most-identifiable landmarks in the downtown core.

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## CONDITION ASSESSMENT

The Qube's central core, which is formed by cast-in-place exposed-aggregate concrete walls, includes stairwells and elevators and is a central part of the structural system of the building. At the top and bottom of the building, the core projects to form part of the building enclosure.



Figure 3. Central concrete core at grade.

At the ground-floor level, the exterior concrete walls are protected by the overhang created by the base of the building above (Fig. 3). The walls of the core have little or no exposure to exterior moisture in this area. At the roof level, the exterior concrete walls form the mechanical penthouse and are exposed to the weather on all elevations with no overhang protection or cap flashings (Fig. 4). During our review, we observed spalling and exposed reinforcing steel, areas of previous concrete repairs, and staining and organic growth associated with wetting.

The curtainwall assembly at the Qube consists of double-glazed insulated glazing units (IGUs) held in place by horizontal and vertical aluminum pressure plates (upgraded in 2006 as part of the structure's repurposing as residential condominiums). Cladding covers are incorporated over the pressure plates with weep holes at the bottom of the caps to facilitate drainage. The curtainwall assemblies include operable casement vents between fixed lites and alternate with horizontal sections of spandrel glass. Within the curtainwall glazing there are small areas of metal cladding covering the structural cables that support the floors. These occur as vertical strips at the corners of the building and at two midpoints on each elevation.

At many locations, there were significant gaps between the sections of vertical cladding covers, including areas where the sealant between cladding covers had failed due to age. These joints in the vertical cladding covers typically occur above each section of spandrel glazing panel.

Cladding covers can be considered as a water-shedding component of the glazing system, as they limit the exposure to wetting of



Figure 4. Exposed-aggregate concrete core at roof level.

other components. As with any rainscreen system, it is not necessary that the water-shedding plane be continuous or without gaps; however, measures must be taken to limit the amount of water entering the system, and obvious deficiencies or discontinuities in the outer shedding surface should be corrected.

As part of the 2006 residential conversion of the building, the cable cladding was updated and replaced. Behind the metal cable cladding, rigid insulation and a self-adhesive air barrier membrane transitioned from the cable enclosure to the adjacent curtainwall assembly (Fig. 5). Horizontal and verti-

cal joints in the metal cladding were sealed with preformed silicone sealant strips. At many locations, these preformed sealant joints had failed adhesively as they aged.

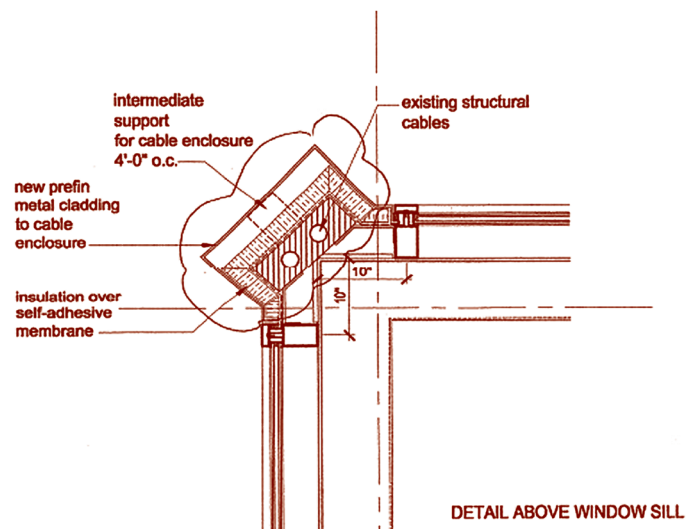


Figure 5. Typical cable enclosure at corners from 2006 conversion.



*Figure 6. The horizontal tops of the concrete core and the cable enclosures were finished with a colored coating of polymethyl-methacrylate membrane.*

## CONSERVATION PLAN

Based on the findings of the condition assessment, it was concluded that maintenance and renewal tasks at the concrete core and curtainwalls were necessary. Because the Qube is a historic site, approval by the City of Vancouver of the proposed work was necessary prior to the start of these tasks.

The primary conservation treatment for the Qube was a preservation treatment. *The Standards and Guidelines for the Conservation of Historic Places in Canada*<sup>3</sup> recommends preservation (“the action or process of protecting, maintaining, and/or stabilizing the existing materials, forms, and integrity of an historic place, or of an individual component while protecting its heritage value”) as a primary treatment when

- materials, features, and spaces of the historic place are essentially intact and convey the historic significance without extensive repair or replacement;
- depiction during a particular period in history is not appropriate; and
- continuation or new use does not require extensive alterations or additions.

A heritage conservation plan was developed to document the historic aspects of the building and its condition, and to explain the

conservation process. In this plan, the proposed interventions were compared to the direction provided by the Standards and Guidelines to ensure conformance with good conservation



*Figure 7. Careful selection of color additives and aggregate types produced a mixture design that was compatible with the existing concrete.*

practice. The heritage conservation plan was used to obtain project approval from the City of Vancouver.

## CONSERVATION WORK

Because most of the conservation work was directed at the character-defining elements of the building enclosure, it was important to ensure that the new materials were both technically and aesthetically appropriate. The project documents identified that mock-ups including custom-colored sealants and custom-colored prefinished metals would be required.

At the rooftop level, the upper concrete core was experiencing high levels of organic growth and concrete deterioration due to the low slope of the tops of the walls and projections. Following targeted concrete repairs at both locations, polymethyl-methacrylate liquid-applied membrane was applied to the low-slope elements (Fig. 6). A color additive was specified to help the coating blend with the adjacent materials. The liquid-applied membrane allowed for easy installation over the curved surfaces.

The vertical surfaces of the exposed-aggregate concrete walls required targeted concrete repairs to address areas of delamination, spalling, and exposed reinforcing steel. While minimizing the appearance of patched concrete is always challenging, this challenge was compounded by the exposed aggregate finish and variations in the color of the original con-



*Figure 8. Cladding covers were repositioned, and custom-colored sealant strips were renewed.*

*Figure 9. The Qube after conservation.*



crete. The two original lifts of concrete used to place the concrete walls had slightly different colors. To accommodate the variances in appearance and achieve a suitable match, the team prepared 12 unique mock-ups with various combinations of color additives and aggregates added to the fiber-reinforced repair mortar (Fig. 7). Before color-matching with the existing concrete began, the walls were lightly washed to remove surface contamination and staining. It was important to establish parameters for the addition of color additives and aggregate types, and this effort involved close collaboration with the manufacturer's technical representative so that the installer could make minor variations in the mixture to best suit the areas that the project team was trying to match.

To address the gaps in the cladding covers of the curtainwall system, the covers were re-

sitioned and small, prefinished metal-deflection clips were installed. The metal clips were prefinished in a custom color to match the existing curtainwall and installed to ensure deflection allowances were maintained. Custom-colored

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and preformed silicone sealant strips were specified and installed at the horizontal and vertical joints in the metal cable coverings (Fig. 8).

## CONCLUSION

The unique designs and materials of mid-century modern buildings such as the Qube can present considerable challenges to heritage specialists and engineers; however, standard practices apply. A properly implemented conservation project extends the physical life of the building enclosure's existing character-defining elements and helps ensure that the building maintains its historic value for years to come (Fig. 9). 

## REFERENCES

1. Canadian Register of Historic Places. "Westcoast Transmission Building."

2. Vancouver Heritage Foundation. "Heritage Site Finder: Westcoast Transmission." January 8, 2018. <https://www.heritagesitefinder.ca/location/1333-w-georgia-st-vancouver-bc>.
3. Parks Canada. *Standards and Guidelines for the Conservation of Historic Places in Canada*, 2nd ed. 2010. <https://www.historicplaces.ca/media/18072/81468-parks-s-g-eng-web2.pdf>.

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## Joe Hale Library of Fort Chiswell, VA, Celebrates Milestones

On Tuesday, May 25, 2021, the Friends of the Fort Chiswell Library celebrated several milestones for the new Joe Hale Library of Fort Chiswell, VA. At the event, the RCI-IIBEC Foundation was recognized for donating \$82,555, which helped the organizers purchase the old First Community Bank building as the library site.

Tony Stroupe, president of the Friends of Fort Chiswell Library, reviewed the organization's progress, which has included becoming a nonprofit and purchasing the old bank. RCI-IIBEC Foundation Board Emeritus Director Joe Hale made brief comments. First Community Bank and the numerous VIPs in attendance, including RCI-IIBEC Foundation Board Chair Mike Blanchette, IIBEC CEO/EVP Brian Pallasch, IIBEC member Elizabeth Grant, and RCI-IIBEC Foundation Development Officer Rick Gardner, were recognized.



*From left, RCI-IIBEC Foundation Board Chair Mike Blanchette, RCI-IIBEC Foundation Board Emeritus Director Joe Hale, and Patsy Hale pose for a picture on May 25, 2021, at the Friends of the Fort Chiswell Library event.*



*RCI-IIBEC Foundation Board Emeritus Director Joe Hale addresses supporters of the Friends of the Fort Chiswell Library event held May 25, 2021.*

"We would not be standing here today without the help of the RCI-IIBEC Foundation," Stroupe said. "I would like to thank everyone with the Foundation and their donors for all the help they have given us. We have a long road ahead of us to get this building paid off and ready to go, but we are going to get it done."

"This is what this library is all about...We have to give back, and we have an opportunity to pay it forward to provide education and technology for our young people," said Joe Hale. "We are looking forward to continued community help in the future as this project develops. One of our next steps is to become part of the regional library system."

Hale added, "I believe we can be whatever we dream to be."

"It is an honor and a pleasure to be a part of this endeavor," said Blanchette. "I'm very impressed with the folks in this local community, how excited and anxious they are for this project to proceed. After meeting with several of the community members, the Foundation is proud to have helped make this possible. I'm hoping we can continue to be active in this."

The library is now accepting book donations and the need of financial contributions continues. For more information, visit <https://rci-iibecfoundation.org/donate.aspx> or contact RCI-IIBEC Development Officer, Rick Gardner at [rgardner@iibec.org](mailto:rgardner@iibec.org) or 919-859-0742.