

Striking the Perfect Balance

ARCHITECTS MARRY LATEST TECHNOLOGY WITH HISTORICAL INTEGRITY IN MASSIVE RENOVATION PROJECT AT PARLIAMENT HILL.

BY THOMAS RENNER

SUCCESSFUL MARRIAGES are built on compromise, integrity, and togetherness. Couples who work together as a team recognize flaws and are able to iron out the differences and blend together to build a harmonious and lasting bond. While there may be imperfections beneath the surface, the united, visible front stands resolute, stable and enduring.

The challenge for architects, engineers and construction officials in the Public Services and Procurement Canada-led renovation of Parliament Hill's West Block were similar to the tests endured in matrimonial matters. The seven-year, \$863-million project finally wrapped up this fall, uniting the charm of a Victorian Gothic structure that was completed in 1865 with the sophisticated technological advancements of 21st-century construction. During the renovations, architects looked at every conceivable angle to modernize the facility while also maintaining the building's historical integrity. It was not an easy balance.

"The West Block was last renovated over 50 years ago," said Georges Drolet, a partner in EVOQ and an architectural historian. The firm formed a joint ventured partnership in 1995 with Architecture 49 to plan and design the West Block Rehabilitation Project. "In that time span, all the expectations and standards of operating and working in a parliamentary office building changed, from security concerns to communications networks, energy efficiency targets, hazardous materials management, universal accessibility standards, broadcasting and public engagement programs and so on. All this added to the wear and tear of a build-

ing erected 100 years earlier. So as time went by, all those issues became pressing, hence the need for an overall, holistic rehabilitation of the building."

Up to the Challenge

Drolet said construction teams faced a multitude of issues in the massive project. Those issues included excavating in proximity and under the historic masonry of a load-bearing structure; concealed routing of mechanical and electrical systems; inserting new elevators; working within tight existing spaces; and meeting lighting and acoustic requirements

for the debating chamber within an open, previously exterior space.

The biggest challenges, however, may have been establishing seismic reinforcement and decontaminating the building from asbestos that was used extensively during the renovation in the 1960s. When Parliament Hill was constructed in the mid-1800s, little was known about fault lines, earthquakes and the potential for destruction. On June 23, 2010, a 5.0 magnitude earthquake was felt across Ontario and Québec, rattling homes and buildings as far south as New York City. The quake's epicenter was only about 35 miles north of



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The \$863-million restoration of the West Block of Parliament is one of the largest rehabilitation projects in North America. EVOQ and Architecture 49 were mandated to conduct a Heritage Structure Report, conduct two pilot projects on the Southeast and North Towers, restore and rehabilitate the exterior envelope, and design a modern addition of an interim House of Commons under a glass canopy roof.

Ottawa, which considers earthquakes one of the five most serious threats, based on its geology and types of buildings, according to an article in the *Ottawa Citizen*.

“The building was never built for the seismic zone it’s in,” said John Cooke, who heads John G. Cooke Associates, an engineering consulting firm that partnered with Ojdrovic Engineering. Both companies were also involved in the restoration of Parliament Hill. “A major fault line runs right through the building, and we had to upgrade the entire building to account for that. When the building was originally constructed, they never would have known about that.”

Cooke said major interventions were also required to remove asbestos. Although architects had expected to keep about 95 per cent of the plaster on the walls, because of asbestos removal, workers could only salvage about five per cent. “When they did the renovation in the 1960s, they packed it full of asbestos,” Cooke said. “It went everywhere. It limited our ability to do the investigation prior to the asbestos being removed.”

Raising the Roof

One of the most fascinating and unique projects in the overhaul of West Block was a complete roof overhaul. A striking, self-sup-

porting, curved glass roof stands overtop the central courtyard, which will serve as the temporary home for the House of Commons. The project by Seele included: 2,485 square metres of triple-glazed glass; 938 tons of steelwork for roof and tree columns; 2,554 square metres of laylight glazing under the roof; 871 square metres of movable louvres; 929 square metres of acoustic panels; and 1,813 square metres of open-grid flooring for a service catwalk at the roof level. The roofing project alone required more than two years of labour.

Several other roofing sections also required roof hatches to access attic space. Aluminum roof hatches with copper cladding and prime painted galvanized steel hatches were custom-made by The BILCO Company of Connecticut and were installed on flat roofs and even on some seriously sloped steeples by Heather and Little and Covertite. “The hatches were a bit harder to install mostly due to the complexity of the design,” said Brian Marshall, a project manager for Heather and Little. “They were installed on a sloping roof that was in a near vertical position.”

Marshall said his team also installed fire-rated floor hatches, also manufactured by BILCO, to gain access to attics and mechanical space, and ladder-up safety posts to help ensure safety for workers entering and exiting the roof hatches. The copper roof at West Block earned a North American Copper in Architecture award from the Copper Development Association and the Brass Development Association.



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The curved roof features 2,485 square metres of triple-glazed glass. Other wings of the project include roof hatches and floor doors manufactured by The BILCO Company to allow access to new mechanical equipment installed at Parliament Hill.

Staying True to the Roots

Perhaps the most essential task for architects and engineers in the renovation was overhauling the structure while remaining true to the historical integrity of the building. Drolet said all interventions made on designated Federal heritage buildings have to comply with a national document, the *Standards and Guidelines for the Conservation of Historic Places in Canada*.

“Those guidelines provide very clear and detailed methodology to manage change within historic structures and sites in order to maintain their integrity,” he said. “It is not always easy but there are recognized ways to achieve it. Designing brand new buildings is not easy either. In the case of a historic site, architects set maintaining historical integrity as one of the project priorities from the start, ensure that construction is planned

accordingly and keep the goal on everyone’s radar until the end of construction.”

Architects and engineers also have to consider the tastes and opinions of the nation’s citizens and government officials. Dramatic changes would cause considerable consternation if some people felt that architects overstepped their bounds in making necessary improvements. “Every part of the building that is historic has been carefully preserved and enhanced,” Drolet said. “In some ways, the West Block recovered heritage character that it had lost inside and outside, so it may have even more ‘historic charm’ than it had before the project started.”

The Final Pieces

In the past, a demolition of the existing structure had been considered. Drolet said a proposal in the early 1960s was made to replace the aging Gothic Revival building with a

brand-new glass construction. “Fortunately, the uproar that idea created led to rethinking the modernization project,” he said. “In the end, the exterior of the West Block was mostly retained but the interior was almost completely gutted. Since then, the building has been granted the highest heritage designation as a historic Federal government building. Any proposed modification to the building has to be submitted to a very stringent review process that aims to protect its heritage character and value. In this context, demolition would never be permitted.”

With the finishing touches now being applied on the West Block, the focus will move to the Centre Block. It is expected to be closed in late 2018 for a multi-year restoration and modernization, similar to that done at West Block.

Drolet said the project at West Block carefully integrated high technical standards of technology, such as building systems and communication networks within the heritage structure while enhancing the historic character of the building and its site. Architects also created new spaces outside the footprint of the heritage structure. “The contemporary architecture creates a rich dialogue with the historic building without ‘stealing the show,’” says Drolet.

The interim Chamber, for instance, is set in an unconventional space that is unique in character, at the forefront of construction and systems and technologies, but also respectful of the traditions and protocols of the House of Commons. In essence, all of the teams involved in the project have weaved together the imperfect marriage of buildings designed in different centuries into one beautiful, harmonious, safe and technologically advanced structure.

“This was the most complex rehabilitation project ever executed in Canada,” says Drolet. “It was done in one of the country’s most valuable heritage buildings. Each decision was analyzed, discussed and reviewed by dozens of professionals, specialists and project managers to make sure that the transformed West Block would meet the challenges of a 21st-century legislative function while celebrating its 19th-century origins. I believe that globally this goal is achieved.”

Thomas Renner writes on building, construction, and manufacturing for trade publications in the U.S. and Canada.