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Allan Gardens' crown jewel shines once more after careful restoration

Dan O'Reilly July 3, 2025

ZIELDER — A view to the north of the exterior scaffolding/enclosure under construction. Tarp "sails" were in the process of being installed to complete the enclosure.

After being closed for two-and-a-half years for a multi-phase restoration, the crown jewel of Toronto's Allan Gardens Conservatory recently reopened to the public.

Constructed in 1909, the Palm House is the central link to a series of greenhouses set among towering trees in the east end park. Patterned after the palm houses built in Britain in the Victorian era, the steel and glass dome structure is used for growing and displaying palms and other tropical plants.

There are three domes, a large central one and two small ones.

But the Palm House was also experiencing a series of operational issues, not the least of which was the deteriorating state of the dome glazing and wood frame windows.

"There were leaks," says Matthew Firestone, associate architect with Zeidler Architecture Inc., the prime consultant/architect of record.

AREA Architects was the heritage architect, RJC Engineers was the structural and building envelope consultant and the HIDI Group was the mechanical and electrical consultant.

ZIELDER – A view from the upper scaffolding looking down towards the Palm House. Glazing has already been removed in the photo. Interior scaffolding is visible through the dome.

An interior view of the upper cupola looking towards the exterior enclosure.

A view of the interior scaffolding within Palm House.

There was also a need to modernize the mechanical, electrical and ventilation systems, improve accessibility, increase user comfort, restore its defining heritage elements and ensure the building's long-term performance and safety, he says.

Beginning in 2019 a series of studies were undertaken by RJC Engineers including a building condition review and an assessment of the structural steel framing supporting the domes.

A key recommendation was to remove the original single pane glass and upgrade the glazing to laminated safety glass for building code compliance. For that to happen a preliminary finite analysis had to be conducted to ensure the domes could support the heavier laminated glass, says Firestone.

Instead of a series of ongoing ad hoc repairs, the RJC studies recommended a "comprehensive restoration approach focusing on major conservation, system repairs and upgrades to achieve contemporary standards for accessibility, life safety and sustainability."

And that was the challenge facing general contractor Heritage Restoration Inc. when all the approvals were given and the project got underway in 2022.

ZIELDER — A view facing west towards the main entrance showing the exterior scaffolding and "sail" enclosure around the Palm House.

"The whole building was enclosed," says Firestone, in reference to the exterior comprehensive scaffolding which was erected to enable year-round interior and exterior access without regard to weather conditions.

An interior scaffolding system was also built inside to facilitate access to the upper end of the dome from the inside.

After glazing subcontractor Universal Aluminum took out the original glazing, the lead paint on the dome's 16 sloping steel trusses was removed and the trusses repainted. Next in this sequence was the installation of the new glazing which consists of 950 laminated glass panels. The vertical aluminum mullions were kept in place throughout construction, says Firestone.

Utilizing the same aluminum glazing structure, the panels are the same width as the original glass panes. However they are approximately twice as long, which allowed for significantly fewer glass joints and increased transparency. On the south side they were treated with fritting to prevent solar heat gain, says Firestone.

The same sequencing was carried out in the restoration of the two smaller domes, he says.

As part of an overall objective to improve energy efficiency, the deteriorated vertical single-glazed base wood frames on the ground floor windows were replaced with thermally insulated double glazing.

That replacement also included the "Union Jack" clerestory windows above, as well as the clerestory windows at the top of the dome's cupola. The Union Jack stems from the fact the frames are in the pattern of the Union Jack flag, he says.

Installing the new glazing, though, was just one component of the complex multi-phase project, says AREA Architects principal David Eckler.

“A primary challenge was balancing the need to incorporate new construction requirements —such as health, safety, security, accessibility and sustainability — while preserving the heritage value and character-defining elements of the historic building.”

Those elements include the reinstatement of the central entrance portico, a key element of the original 1909 design which was removed in the 1950s.

“This reinstatement was a significant alteration which constituted a positive heritage restoration initiative.”

Careful co-ordination was required to emulate its historical features while serving modern functions. An original interior vestibule was removed because it didn’t comply with Accessibility for Ontarians with Disabilities Act standards.

As well, the entrance door was made wide and high enough to permit the entry of maintenance equipment including a scissor lift to access the upper dome. A new polished floor can accommodate that equipment, as well as facilitating the Palm House as an event space, says Eckler.

Other work included selective repairs to the exterior stone wall and “the integration of old and new technology. Since its construction a ventilation tunnel has drawn cool air into the Palm House, while hot air is ejected through the clerestory windows. Previously, those windows had to be opened manually. Now, they’re opened by the Palm House’s building automation system,” says Eckler.