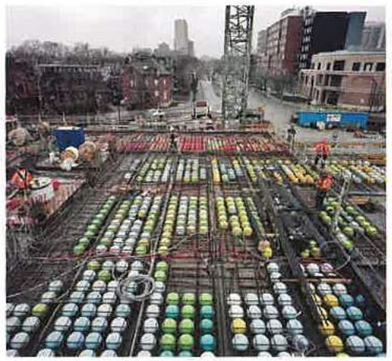
Daniels Building at One Spadina Crescent
Toronto
NADAAA with Adamson Associates Architects and ERA Architects

NIC LEHOUX

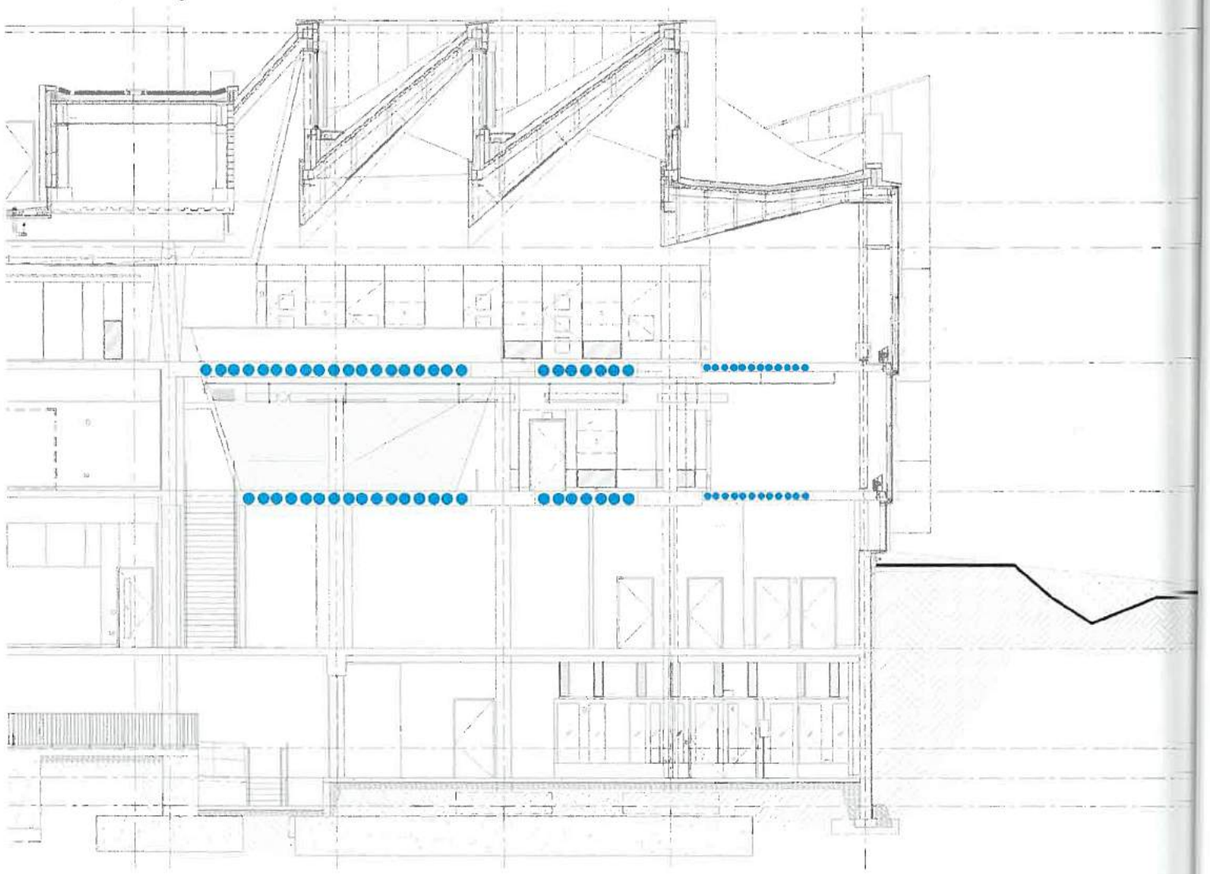


Previous Spread: North façade

Far Left: The addition, at left, and the restored historic façade, at right

Left: Recycled plastic spheres held in place before the concrete is poured to form void slabs

Addition Section, Showing Void Slabs



TOP LEFT: NIC LEHOUX; TOP RIGHT: PETER MACCALLUM, COURTESY THE DANIELS FACULTY

An architecture school addition shows how careful material choices can augment even that most sustainable of design strategies: building reuse.

The imposing Gothic structure at the center of Spadina Crescent, an island in a circular intersection near downtown Toronto, has played many roles in its nearly 150-year history: At different times it has been a theological college, a military hospital, and an eye bank. It was nearly demolished in the 1960s, and for decades after suffered from neglect—despite being owned by the University of Toronto. Finally, in 2013, the university announced that it would rehabilitate and expand the building to make a new home for its John H. Daniels Faculty of Architecture, Landscape, and Design, hiring Boston-based firm NADAAA to lead the effort, with local firm Adamson Associates Architects as the executive architect.

From the beginning, the firms saw the brief in three parts: make the building sustainable, make it a teaching tool for design students, and knit it back into the surrounding community. The overarching goal was to leverage the existing building's resources wherever possible, while minimizing the impact of new materials.

The revamped building is two pieces stuck together—the original, U-shaped Gothic pile and the sleek-lined addition, which nestles inside the U. ERA Architects, a local firm that specializes in historic preservation, assisted in the rehabilitation of the original structure, which involved installing a modern HVAC system and high-performance windows. The architects played to the building's advantages, including its high ceilings and abundant natural light: "As much as possible, we wanted to maintain those existing features," says Andrew Pruss, a principal at ERA.

NADAAA relied heavily on the original structure's substantial south-facing thermal mass for the addition: "Because the existing building is U-shaped, is serves as insulation that holds the addition in place," says principal Nader Tehrani. "It gives us a very conservative loss of energy." The firm also took inspiration from the high volumes and large windows of the original building for the three-story addition—especially on the top floor. The first two floors are encased in a concrete frame, but the roof is supported by a pair of steel scissor trusses, which create broad, light-filled spaces; the floor and roof slabs are precast void slabs, which have recycled plastic spheres set inside, and use 30% less concrete than traditional slabs.

The addition gains further energy savings by limiting the amount of glazing on the east and west façades. In fact, taken together, the entire structure has a net EUI of only 62 kBtus per square foot per year—40% less than comparable academic buildings.

Given that site is surrounded on all sides by a busy traffic circle, pedestrians once took their lives in their own hands just trying to get to the building. "It was very disconnected from campus and the surrounding neighborhoods," says Marc Ryan, a principal and co-founder of Public Work, which oversaw the landscape renovation for the project. "Part of our agenda was reconnecting it." That meant, first of all, expanding sidewalks and pathways—including a pedestrian walkway between the old building and the addition—so that people can pass through the site. It also meant creating different green spaces around the building, including an expansive lawn on the south side and an 18-foot-tall rise covered in native plant species to the north. "The landscape is a major player in the overall design," says Richard Lee, an associate at NADAAA. "The landscape and the building often seem to be playing off one another." A 365-cubic-meter (96,422-gallon) cistern under the green allows the site to achieve a 100% stormwater retention rate. Several of the pathways are surfaced in a permeable bonded gravel—the sort of innovation intended to showcase the role of new technologies in sustainable design.

The entire building, in fact, offers large and small lessons for the students—from the adaptive reuse of a neglected property to the latest technologies that help minimize the use of resources in construction. "The idea of a pedagogical building is that it's a space for teaching, but also a didactic instrument," Tehrani says. "The whole building is an tool for them to pursue their research." —C.R.

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Mandatory Metrics

CO_2 Intensity: 58.74 pounds per square foot

Estimated Carbon Emissions Associated with Building Construction: 74 pounds per square foot

Project Attributes

Architect: NADAAA with Adamson Associates Architects and ERA Architects
Owner: The University of Toronto/The Daniels Faculty of Architecture, Landscape, and Design
Location: Toronto
Project Site: Historic structure or district
Building Program Type(s): Education—College/University (campus-level)
Year of Design Completion: 2017
Year of Substantial Project Completion: 2017
Gross Conditioned Floor Area: 155,000 square feet
Gross Unconditioned Floor Area: Zero
Number of Stories: Four
Project Climate Zone: ASHRAE 6
Annual Hours of Operation: 8,200
Site Area: 123,150 square feet
Project Site Context/Setting: Urban
Cost of Construction, Excluding Furnishings: $51.9 million
Number of Residents, Occupants, and Visitors: 10,000