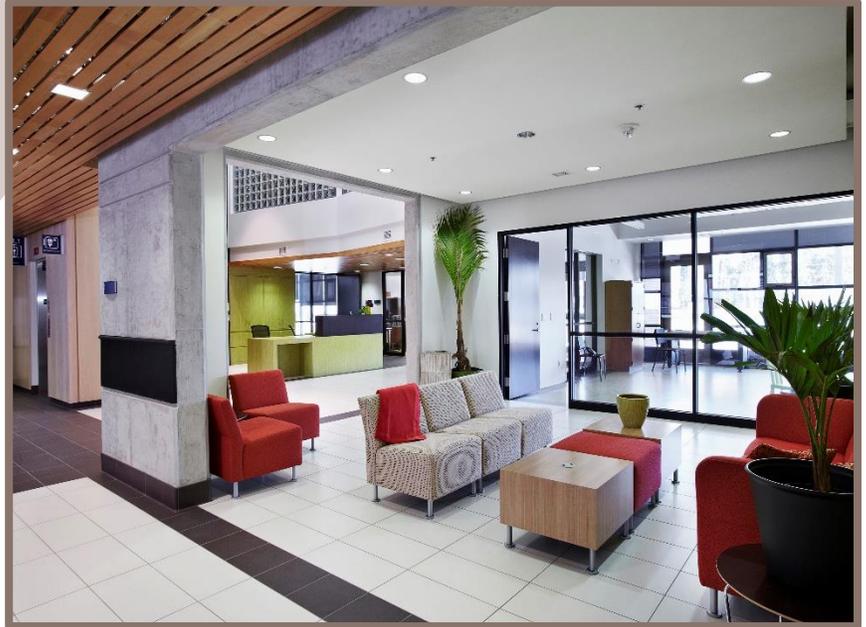


SUSTAINABLE CONCRETE CONSTRUCTION

W. ROSS MACDONALD SCHOOL - SENIOR STUDENT RESIDENCE FOR THE BLIND AND DEAF-BLIND



PROJECT CREDITS

OWNERS

Ministry of Infrastructure/Infrastructure Ontario
Ministry of Education – Provincial Schools Branch

ARCHITECT OF RECORD

MMMC Architects

ENGINEER OF RECORD

Tacoma Engineers

GENERAL CONTRACTOR

PCR Contractors Inc.

MATERIAL SUPPLIER

St Marys CBM

ADDITIONAL PARTICIPANTS

- BASF Canada Inc.
- Carpenters Local 785
- EllisDon Corporation
- LIUNA Local 1081

PROJECT FACTS

LOCATION Brantford, Ontario

COMPLETION August 18, 2014

SIZE 61,602 sq ft (Gross Building Area)

CONSTRUCTION COST \$13.6 M

QUICK PROJECT FACTS

Concrete: Primarily Cast-in-Place with interior stairs being pre-cast

Tonnage: 7,700 tonnes (3,200 m³) – includes interior and exterior concrete

Span Length: Spans up to 9.0 m

Sustainability: Building was designed to meet LEED Silver Standard





GENERAL PROJECT DESCRIPTION

This new Senior Student Residence at the W. Ross Macdonald School is designed specifically for students who are visually impaired, blind and deaf blind.

The new 76-student residence is for senior students who will live in self-contained apartment style “pods” of 6 and 8 students. The residence links directly to the school, providing an all-weather internal, accessible connection for students.

The ground floor houses two short stay apartments that will be used for visiting students and amenities including training classrooms, café, activity, music, study, computer and lounge areas. The second and third floor levels house full time students in four residential POD’s per level and amenities for these students to help them develop life skills.

The building has been designed to meet LEED Silver standards and features sustainable building systems such as geo-thermal energy for heating and cooling, reduced water consumption utilizing collection, storage and use of rain water for grey water plumbing systems, energy efficient lighting and natural daylighting strategies.

The open space of the three-storey atrium allows for natural light to filtrate deep into the building and also acts as a wayfinding mechanism that utilizes sound to guide visually impaired students throughout the building.

Specialized wayfinding design elements play an important role in this building.

W. Ross Macdonald School property is designated as a Heritage Place and the new residence ensures that the heritage attributes and character-defining elements of the campus are preserved.

THE EFFECTIVE USE OF CONCRETE

Concrete was selected by the design consulting team for several important reasons. As a structural system, concrete afforded large open spans, suitable for the proposed architectural program, with clean simple connection details that were left exposed in main public areas.

This building was designed with a reinforced concrete structure to take advantage of the strength, durability and clean lines that are an inherent concrete feature. Poured concrete corridor walls maintained straight, flush lines for unobstructed wayfinding for sight impaired students. These corridor walls were finished to an architectural level of finish and also incorporated continuous reveals.

Poured concrete suspended floors permitted long spans while maintaining a solid feel and a highly durable finish. It also allowed for offset and jogging loadbearing walls and structure below while ensuring a clean, slim structure. Cantilevers were incorporated in the floors at the atrium to create an overhanging nook, and along the south building elevation to permit continuous glazing and a building overhang. The flexibility of reinforced concrete allowed for support of the out hanging brick façade, building canopy and cantilevered floors, while maintaining clean lines below.

Reinforced concrete walls were kept straight and slim, and lintels and beams were incorporated into the width of the walls to maintain room dimensions and spaces. Using reinforced concrete ensures the owner of long term durability and minimal maintenance for these building walls.



END USER BENEFITS FROM USE OF CONCRETE

The excellent sound absorptive quality of concrete is perfect for a building where noise and vibration is very undesirable to the sensitivities of the blind and deaf-blind building occupants.

Exposed concrete walls were finished with an architectural burnished appearance with a cast in place smooth concrete band 'trail rail' that is dyed black for visual enhancement. The visually impaired students are in continual contact with the exposed surfaces as they 'trail' their way through the residence with their hands and guide canes.

Exterior wayfinding was enhanced by poured concrete sidewalks designed with a narrow dark edge for a contrasting visual cue for low-vision students and a physical cue for students using guide canes.



Interior stairs were constructed of precast concrete for durability and the ability to be used immediately after installation during construction.

Footings and foundation walls were also poured concrete for durability, flexibility to form to ground shapes and for strength.

The durability and finished textural qualities of concrete was a very important consideration, as the exposed concrete material is used for all main public corridor walls and stairways.

Additionally, the inherent fire resistance properties of the concrete allowed a simpler structural system without the need to conceal the inherent beauty of the material.