EV3 Building, University of Waterloo

EV3 BUILDING UNIVERSITY OF WATERLOO

WATERLOO, ONTARIO

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DESIGN AND CONSTRUCTION TEAM:
Akitt, Swanson & Pearce Architects

STRUCTURAL/ELECTRICAL ENGINEERS:
Walter Fedy

DESIGN BUILD CONTRACTOR:
Cooper Construction Ltd.

STEEL CLADDING SUPPLIER:
Vicwest

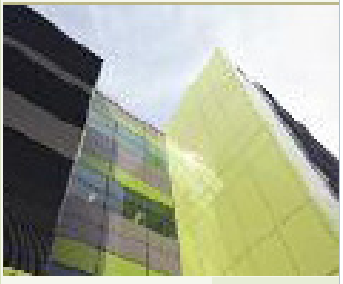
STEEL CLADDING INSTALLER:
Commercial Sheet Metal

STEEL STUD SUPPLIER:
Bailey Metal Products

STEEL STUD INSTALLER:
Dixon Drywall

LINER PANELS INSTALLER:
Commercial Sheet Metal

STRUCTURAL STEEL SUPPLIER/ INSTALLER:
Telco Steel Works



The extensive use of steel in the construction of the Environmental 3 Building at the University of Waterloo helped satisfy several design objectives. To expand and transform aging facilities to address the University's demand for new programs and a growing student population, as well as to create a distinct new image for the faculty. Steel inside and out helped satisfy these design objectives.

Construction of the project, completed at the end of August 2011, included a 5,295m^2 (57,000 sq. ft.) addition and a 465m^2 (5,000 sq. ft.) renovation to the University's two-storey EV2 building. Previously housed within two adjacent, connected and dated buildings – EV1 and EV2 – that were constrained on a limited site located within the campus ring road, EV3 was built over a large part of the existing building, minimizing its footprint on the campus plan while taking advantage of the ample available vertical space.

Architect Kevin McCluskey, Principal, Akitt, Swanson and Pearce Architects Inc. says, "The project needed to be designed and constructed within limited budget and schedule constraints and the initial LEED silver target was upgraded to LEED platinum – one of only a few buildings in Canada to hold that distinction."

The new four-storey building features structural steel supplied and installed by Telco Steel Works, light steel stud framing for all partions supplied by Bailey Metal and installed by Dixon Drywall, and colourful steel cladding supplied by Vicwest and installed by Commercial Sheet Metal.

The steel structure features two parallel two-storey, 45.72m (150') long steel trusses that span over the existing two storey EV2 building while remaining structurally independent. Two large two-storey 10m high x 47m long (32.8 ft. high x 154 ft. long) steel trusses form the sides of the third and fourth floor additions and are supported on columns located clear of each end of the EV2. These trusses support five other 5m high x 30m long (16.4 ft. x 98.4 ft.) members that span perpendicular and support the fourth floor. The third floor is hung from these trusses. "The truss members and supporting columns are visible through the exterior curtain wall glazing and exposed or expressed throughout the interior at specific locations," says McCluskey.

The building's rectangular massing, comprised of structural metal studs with galvanized panel air/vapour barrier, was chosen for its cost and construction efficiency. It is offset by the playful use of a variety of exterior cladding materials including four-sided SSG curtain wall, multi-coloured corrugated steel siding panels, and aluminum composite panels and architectural masonry. "Steel siding was a costeffective solution that is fast and easy to install and durable. We chose to use the corrugated profile in a contemporary look which brings an appropriate scale and level of texture to the skin of the facade," says McCluskey. "Most striking is the introduction of vibrant green coloured aluminum and glass panels which clearly identify this as the environment building and project a strong sense of identity and confidence as the new home for the faculty. Siding and masonry colours are kept neutral to allow the green to really 'pop'."

The .46mm (.0179") corrugated prepainted steel siding panels are in two colours: 10,000 Series Charcoal QC690 and Stone Grey QC998, with a detailed vertical and horizontal reveal system between the panel colours.

The extensive use of steel in the construction of the EV3 Building at the University of Waterloo features structural steel; interior light steel stud framing for all partitions; light steel wind bearing studs on exterior walls; light coated steel liner panels and colourful prepainted steel wall cladding.

The flat panel is AD-300R, .76mm (.0299") thick Bone White used at the back of parapets and the aluminum composite panels are Vicwest 4mm (.157") thick, Duranar finish custom colour Lime Green BK60603 with the liner panel Vicwest L-800, .46mm (.0179") thick, light coated galvanized steel.

At the heart of the building is a new four-storey sky-lit atrium, which cuts east/west through the addition separating the four-storey student spaces to the north from the two-storey faculty offices and EV2 to the south. The atrium features a two-storey living wall, the exposed red brick wall of EV2 and a glass and steel feature stair with a bold cantilever out into the atrium between the third and fourth floors.

Upper levels of faculty spaces offer exceptional working environments. The majority of offices are located along the perimeter, or adjacent to the atrium, and there are two fourth floor sky lit courtyards. "All of this brings a lot of natural light to the interior and the offices are fitted with operable windows and large expanses of glazing at corridor walls," says McCluskey.

The existing EV2 roof has been transformed into a green roof that can be accessed from the third floor and is overlooked by third and fourth floor faculty offices.

PRIMARY TRUSS:
Supporting columns at ends:
WWF500x254, 18.8m high (spliced)

Vertical truss members:
W310x283, W310x158, W310x107, 10.1m high

Horizontal members at 3rd floor:
W310x226 (ends), W310x342 (center), 47m long

Horizontal members at 4th floor:
W410x39, W 410x46 (center), 47m long

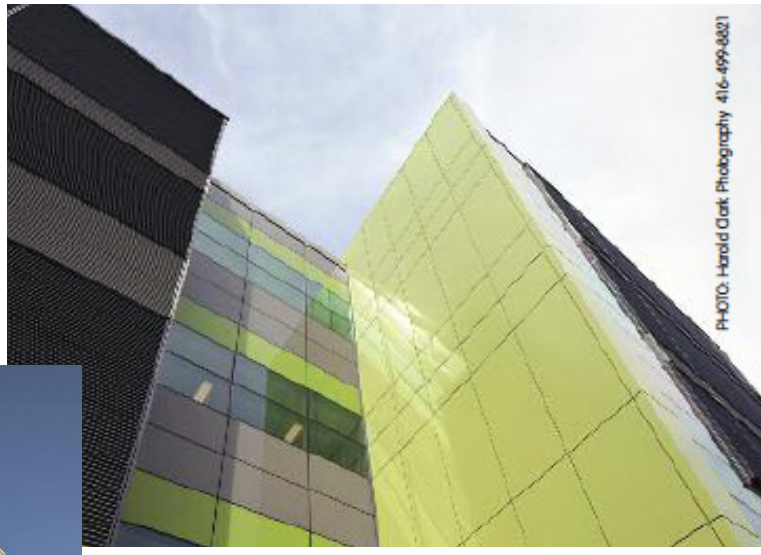
Horizontal members at roof:
W310x375 (ends), W310x454 (center), 47m long

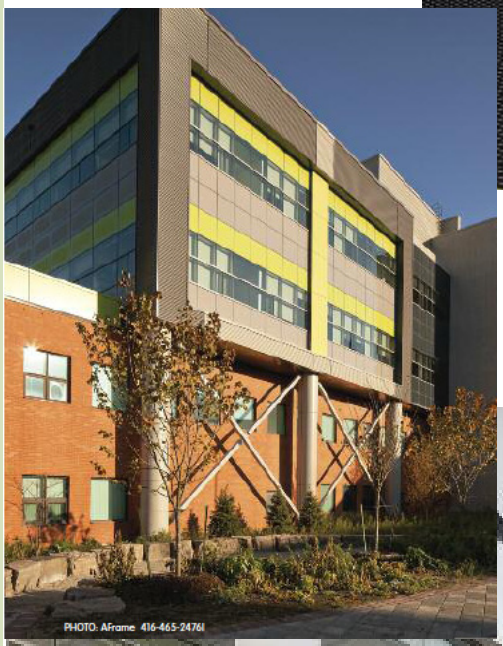
Diagonals:
W310x313, W310x202, W310x97, (in order outside to center)

Two large 2-storey 10m high x 47m long (32.8 ft. high x 154 ft. long) steel trusses form the sides of the 3rd and 4th floor addition and are supported on columns located clear of each end of the EV2.

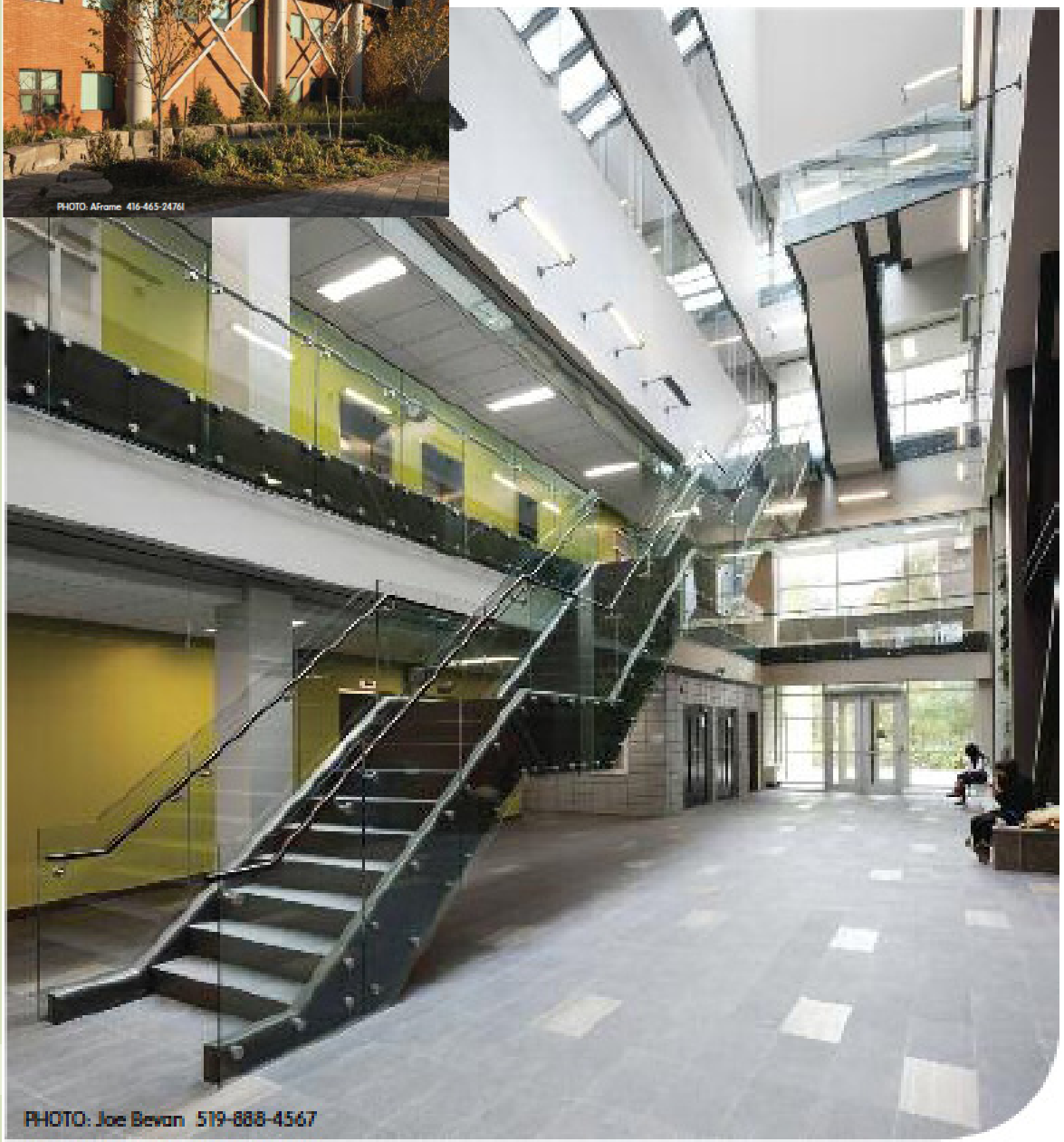
Canadian Sheet Steel Building Institute
652 Bishop St. N., Unit 2A
Cambridge, ON N3H 4V6
Tel: (519) 650-1285
Fax (519) 650-8081
www.cssbi.ca

The corrugated prepainted steel cladding and masonry colours are kept neutral to allow the vibrant green and glass panels, which clearly identify this as the Environment Building and project a strong sense of identity and confidence as the new home for the faculty.





The atrium (below) features a two-storey living wall, the exposed red brick wall of EV2 and a glass and steel feature stair with a bold cantilever out into the atrium between the third and fourth floors.



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