CLIENT Glengarda Child and Family Services, Windsor **ARCHITECT** Passa Associates Inc., Architect, Windsor **STRUCTURAL ENGINEER** Aleo Associates Inc., Consulting Engineers, Windsor **MECHANICAL / ELECTRICAL ENGINEER** Enermodal Enginnering Limited, Kitchener **CONTRACTOR** Wincon Construction 1986 Limited, Windsor **PHOTOGRAPHY** Dan Reaume Photography, LaSalle, ON and Passa Associates Inc., Architect, Windsor

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Glengarda Child and Family Services Reno

Sustainable design begins with building upgrade, re-use

DAVID ROMPF

In 2005, Passa Associates Inc., Architect was presented with the opportunity to design and implement the renovation of an existing former industrial hospital linen building into a sustainable and energy efficient new home for Glengarda Child & Family Services of Windsor, Ontario.

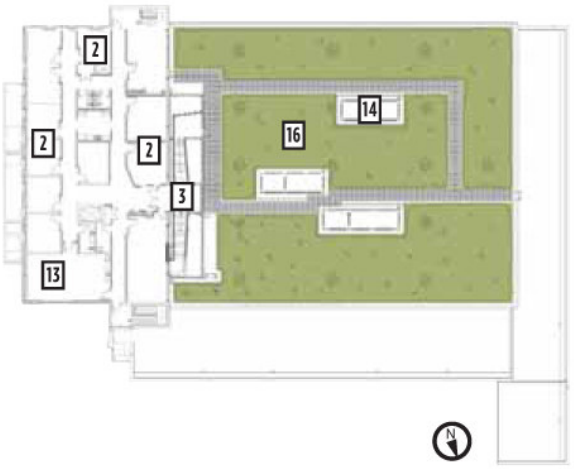
Glengarda Child & Family Services is a multi-disciplinary Children's Mental Health Centre, offering mental health services to families whose children are in need of treatment. The building program includes classrooms, consulting rooms, administrative areas and a variety of support spaces.

The organization was in need of more space and was considering either a new facility or the renovation of the existing former laundry facility on the Windsor Regional Hospital campus. After initial consultations with the architect, and a space needs analysis with favourable budget predictions, the decision was made to re-use the existing building.

The intent was to retain as much of the existing building as possible and to incorporate existing features into the design. Most of the existing structural elements and exterior walls were maintained, although the uninsulated building envelope was substantially upgraded. The high clerestory window configuration was kept with the windows being replaced. The high ceiling work area was maintained with its original wood plank roof decking.

THE MAIN LOBBY/ATRIUM WITH DOORS LEADING TO THE LIBRARY AND RESOURCE ROOM. UPGRADED INSULATION, A NEW GREEN ROOF, AND ENERGY RECOVERY VENTILATORS HELPED TO MAKE THE RENOVATED BUILDING 64.4% MORE ENERGY EFFICIENT THAN A BUILDING DESIGNED TO THE MNECB [1]. THE SECOND-STOREY BRICK VENEER WAS REMOVED AND REPLACED WITH AN EIFS SYSTEM TO BETTER ELIMINATE THERMAL BRIDGING AT THE ROOF LEVEL [2]. MAIN ENTRANCE. THE ORIGINAL BRICK WAS MAINTAINED ON THE FIRST FLOOR EXTERIOR, AND ALL WINDOWS WERE REPLACED WITH FIBREGLASS WINDOW FRAMES AND LOW-E, ARGON GAS-FILLED GLAZING [3].

First floor plan



Second floor plan

1	Reception	5	Treatment/isolation room	9	Group room	13	Conference room
2	Office	6	Resource room/AV storage	10	Play therapy room	14	Light monitor
3	Atrium/Lobby	7	Staff room	11	Interview room	15	Fenced in play area
4	Classroom	8	Safe/monitor room	12	Mechanical service room	16	Green roof

The renovated facility is a 2,975 sq.m two storey structure which was verified by Natural Resources Canada's Commercial Building Incentive Program [CBIP] to be 64.4% more energy efficient than a building designed to the MNECB [Model National Energy Code for Buildings]. Efficiencies were gained from the use of a new raised 90mm-thick insulated floor slab with in-floor radiant heating and cooling on the ground floor of the building, energy recovery ventilators, heated water provided by gas-fired condensing boiler units, and a scroll compressor chiller providing cooling water.

The upgraded building envelope also contributed significantly to energy savings. It had to be developed to deal with the lack of insulation in the majority of the existing exterior walls and roofs. Ultimately, it was possible to achieve fully insulated and uninterrupted high performance building encapsulation involving the use of spray applied, rigid and batt insulation in order to eliminate all thermal bridging. The existing brick facade of the second floor exterior walls was removed and EIFS was installed in order to better eliminate thermal bridging occurring at the second floor roof level by providing an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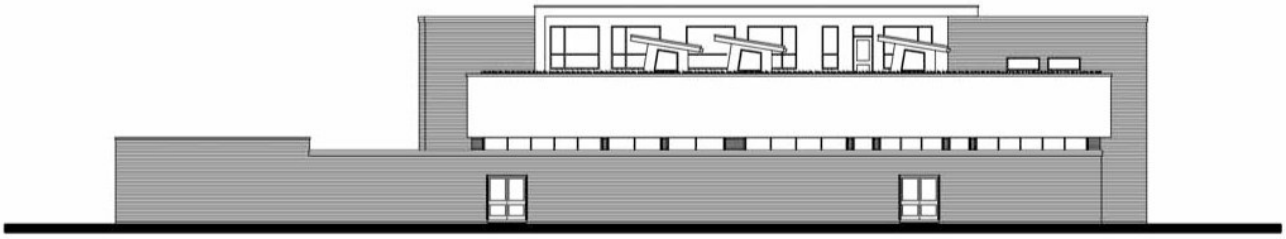

West elevation

overlap of both exterior and interior insulation. To maximize the building envelope performance, fibreglass window frames with argon gas filled, low-e sealed glazing units were installed in all locations.

Further energy efficiency was achieved by incorporating daylight harvesting into the building. In order to take advantage of the existing building's solar orientation and allow ample amounts of natural lighting into the building, new window openings, rooftop light monitors and a glazed wall atrium space to enclose a new convenience stair were installed. This daylighting design combined with the use of high efficiency light fixtures, occupancy sensors and daylighting controls allowed for extremely high energy efficiency and lighting quality.

The reuse of the majority of the existing main structural and exterior facade elements of the building in the renovation and the extensive salvaging and recycling of other elements of the building are key sustainable features of the project. The existing roofs of the building were removed down to the decking and covered with a cold process roof system on R20 polyisocyanurate insulation over the low roof areas and second floor roof. The roof over the high ceiling space was converted into an 835 sq. m. green roof incorporating a root stop layer, 100mm of rigid insulation, a water drainage / retention layer, filter fabric, 150mm of growing medium and indigenous plant material. *cont'd p.50*

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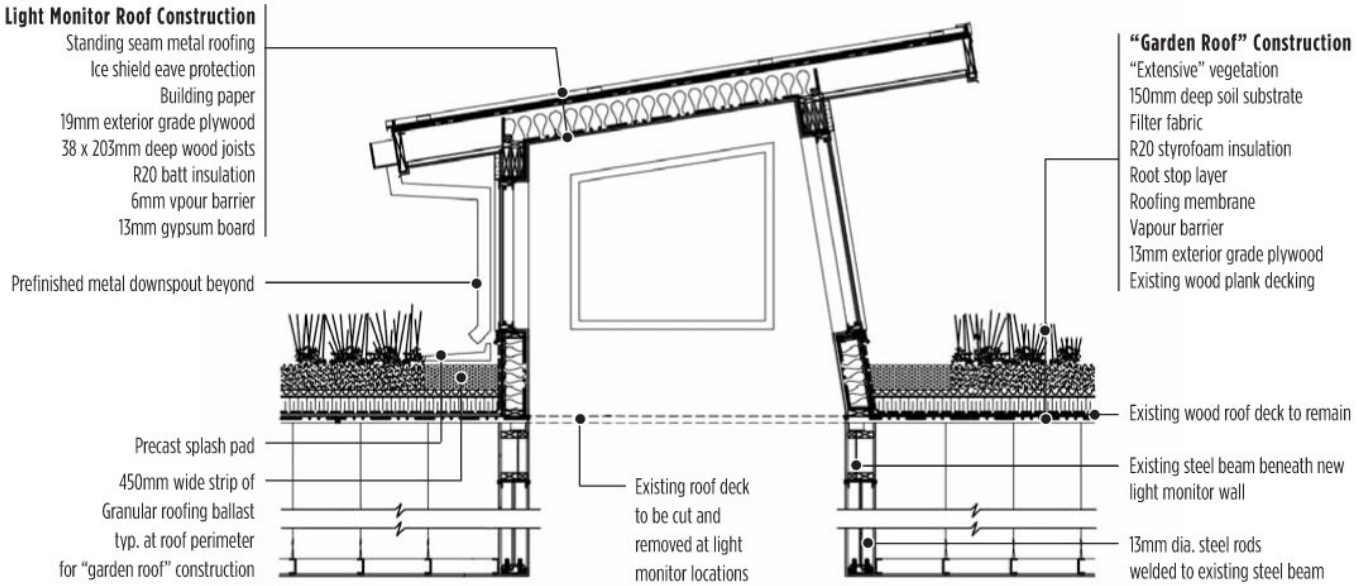
TYPICAL CORRIDOR SHOWING STRONG USE OF COLOUR AND PLENTY OF NATURAL LIGHT ADMITTED THROUGH CLERESTORY WINDOWS. ALL PAINT IS LOW-VOC [4,7]. MANY OF THE WINDOWS ARE OPERABLE FOR NATURAL VENTILATION SUCH AS IN THIS CLASSROOM [5]. THE STAIR TO THE GREEN ROOF VIEWING LANDING [6]. THE LIBRARY AND RESOURCE ROOM. MANY OF THE FLOOR AREAS ARE FINISHED WITH DURABLE, NATURAL, COLOURFUL LINOLEUM [8].



Typical light monitor section

MATERIALS

Exterior

- Green roof uses Tremco Burmastic and TRA-LRM roof membranes; **BASF Canada** polyurethane spray foam insulation and air barrier, EIFS [Exterior Insulation Finishing System] is Outsulation MD by **Dryvit Systems**; fibreglass frame windows, double glazed, argon filled with low-e coating by **Inline Fibreglass**

Interior

- ICI Dulux low-VOC paint; **Forbo** Marmoleum [linoleum] flooring, ceramic and VCT [vinyl composition tile] by Centura Flooring, Rehau radiant floor heating, millwork uses Panval by Uniboard; lighting by Lithonia Lighting and Axis Lighting; plumbing by Zurn and American Standard; building controls by Tour Andover Controls

HVAC

- Venmar Energy Recovery Ventilator, Lochinvar boilers, **McQuay** water-cooled scroll compressor chillers

ROOF-TOP MONITORS ON THE GREEN ROOF BRING NATURAL LIGHT INTO THE CORE OF THE BUILDING [9].

Additional project elements which are sustainable in nature include operable windows, the extensive use of linoleum flooring in the corridors and some public areas of the ground floor and the use of low-VOC emitting paints and finishes throughout. Low flow / automated control lavatory and water closet fixtures were installed throughout the project. The only irrigation system installed for the building was for the green roof which was only needed for the first two years to ensure thick vegetation growth.

The existing site was minimally affected with the existing asphalt parking areas that needed to remain being resurfaced while other asphalt surfaces were removed to create more green space. Existing plants and trees on the site were maintained or relocated. Following construction, the site had 50% green coverage as compared to 30% green space coverage prior to construction. ◂

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See more on this project in the March/April SABMag issue at www.sabmagazine.com