# SABMag

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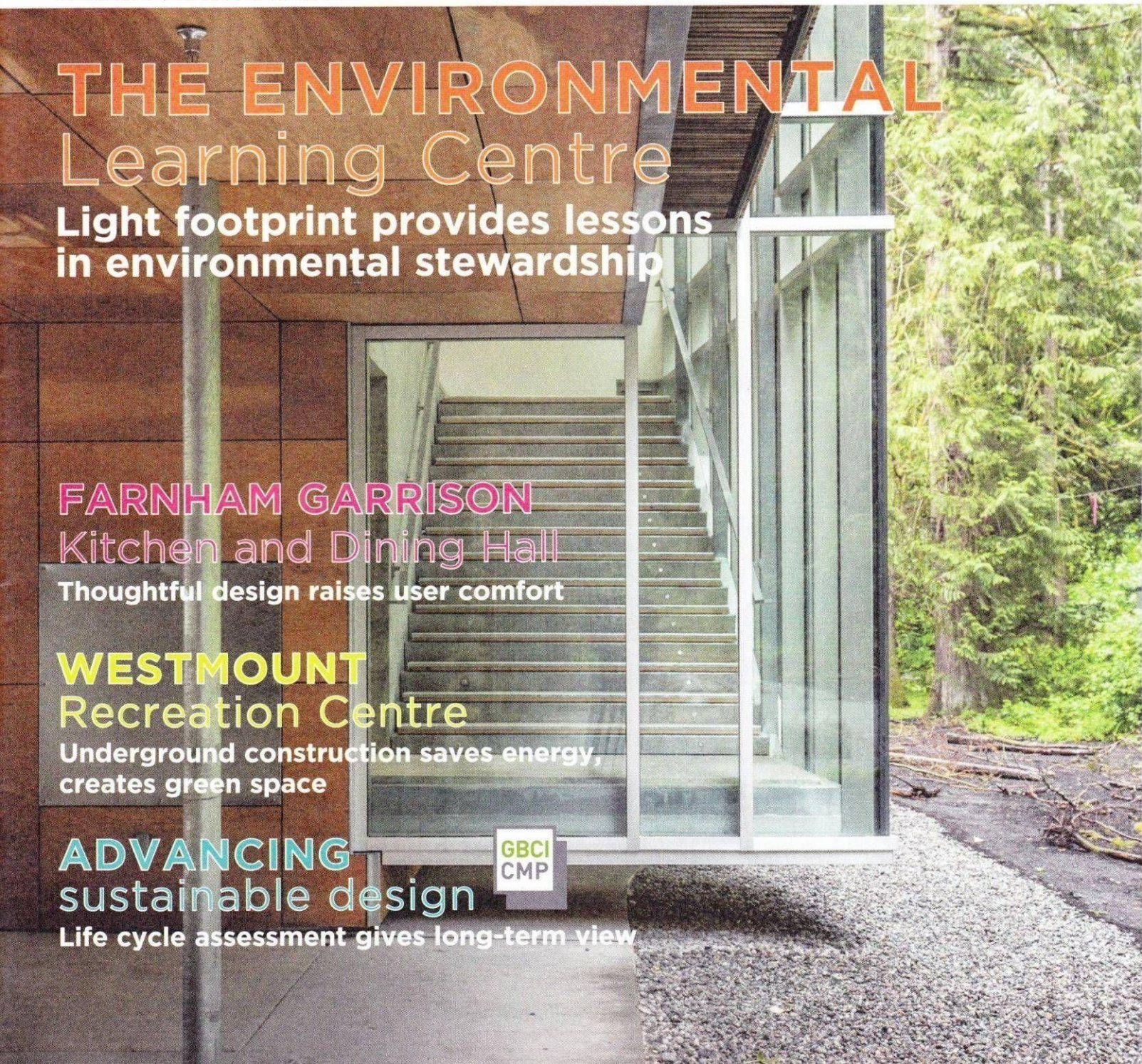


## THE ENVIRONMENTAL Learning Centre

**Light footprint provides lessons in environmental stewardship**

## FARNHAM GARRISON Kitchen and Dining Hall

**Thoughtful design raises user comfort**

## WESTMOUNT Recreation Centre

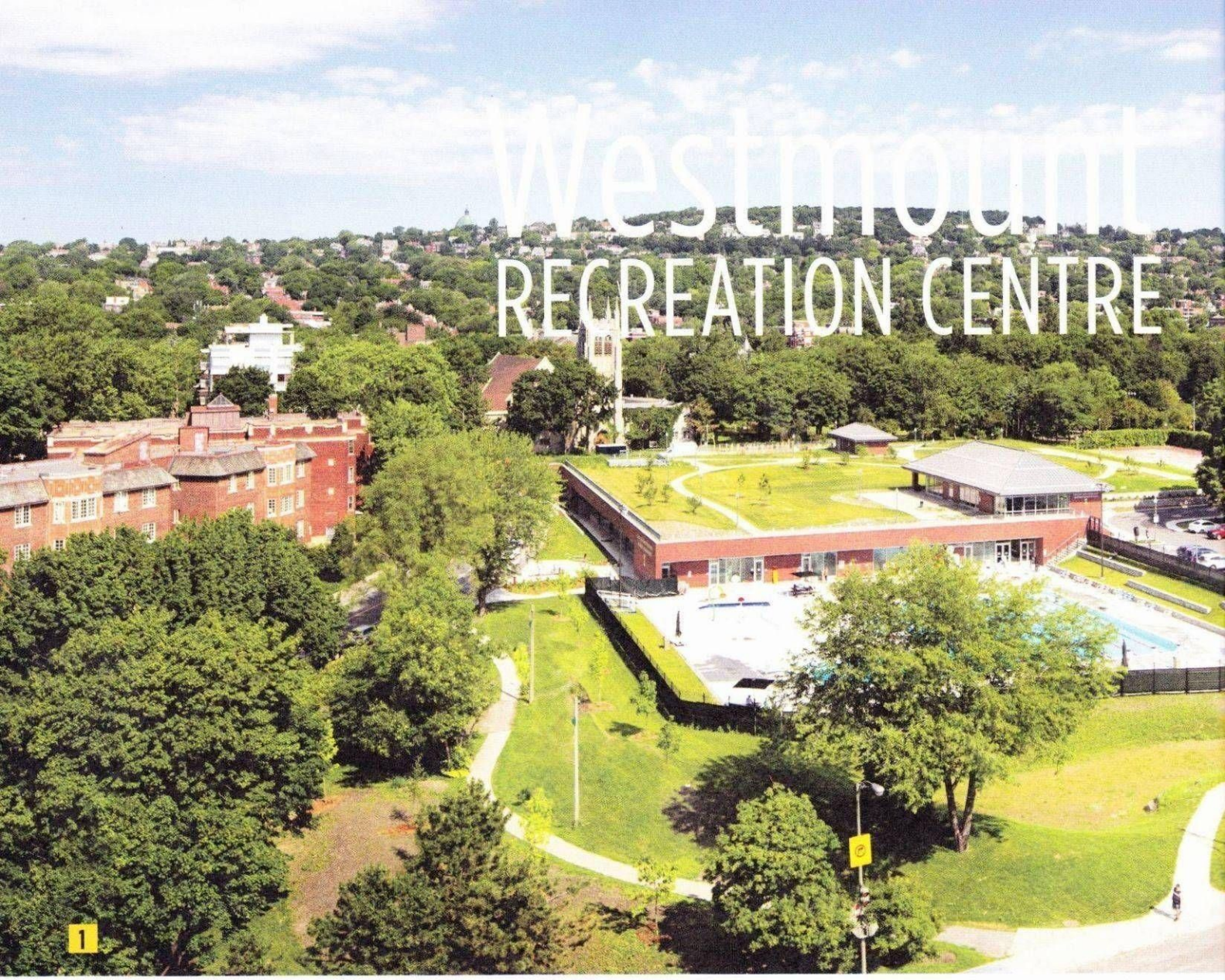
**Underground construction saves energy, creates green space**

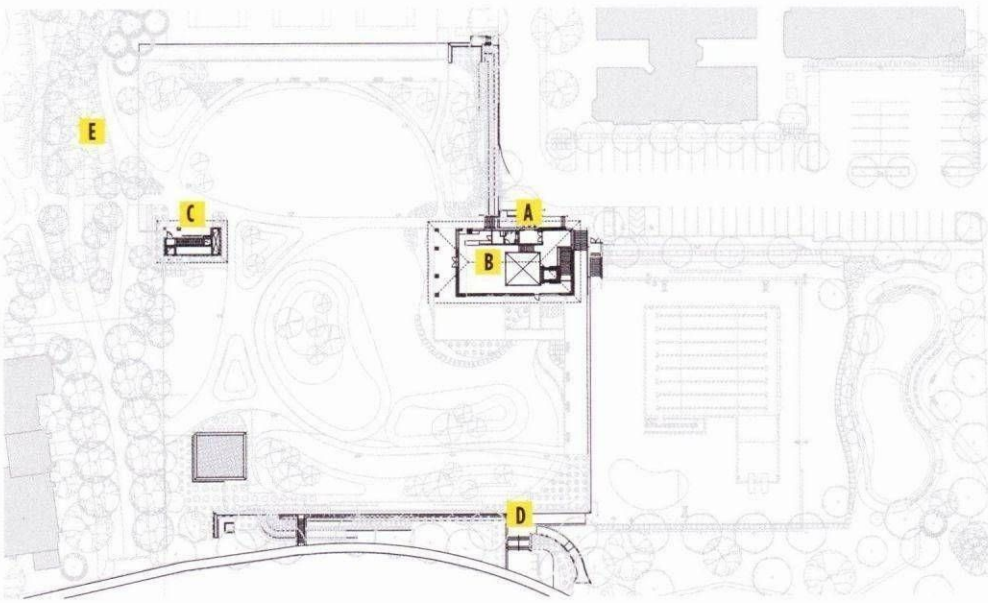
## ADVANCING sustainable design

GBCI CMP

**Life cycle assessment gives long-term view**

# Westmount RECREATION CENTRE



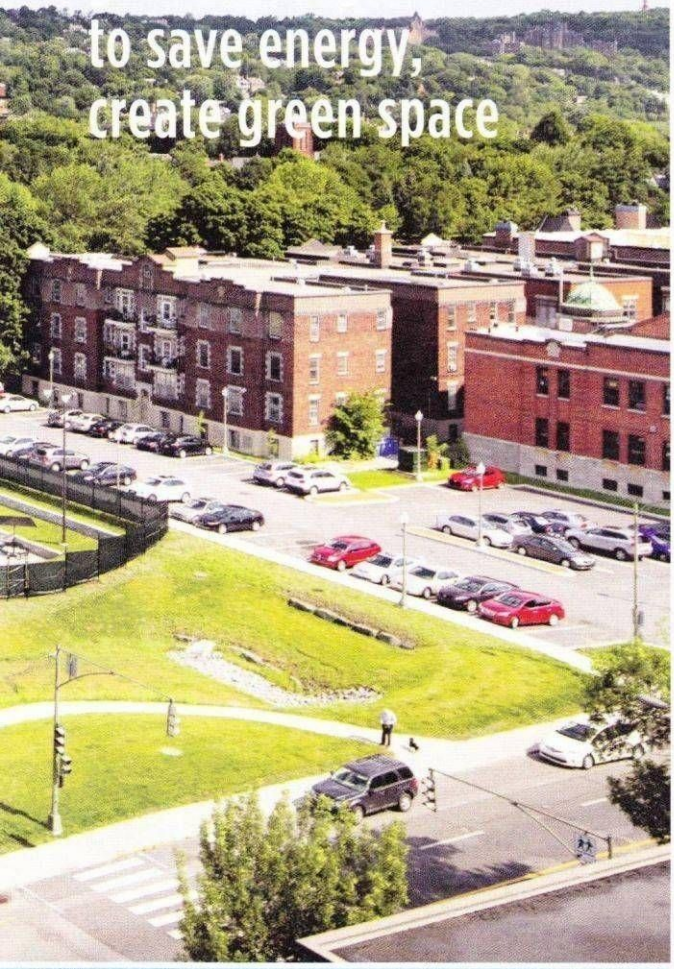




**Site plan**

- **A** Main entrance
- **B** Café
- **C** Exit/Mechanical
- **D** Secondary entrance
- **E** Westmount Park

THE RECREATION CENTRE IS SET BELOW GRADE TO REDUCE THE VISUAL IMPACT OF THE BUILDING. THIS RESULTS IN BOTH ENERGY SAVINGS THROUGH THE EFFECT OF EARTH SHELTERING, AND THE OPPORTUNITY TO CREATE AN ADDITIONAL 0.6 HECTARES OF PARKLAND [1].

# Recreation centre goes underground to save energy, create green space



Built in the 1960s, the former Westmount arena and pool were outdated and in need of major renovations. To respond to the present needs of Westmount residents, it was decided that the existing facilities would be demolished to make way for a new complex on the previously developed site, which had the advantage of being close to public transportation and a number of other services, notably a school, church, daycare and supermarket.

BY ERIK MAROSI AND SHAWN MOSCOVITCH

The new 8,270 m² Westmount Recreation Centre [WRC] houses two NHL-sized ice-rinks with seating for 200, several multi-functional spaces, administrative offices, a youth centre, a café and an outdoor pool with locker rooms. The project is targeting LEED® Gold certification.

Because arenas require little or no natural light, it was decided to set the new WRC below grade, beneath a vast landscaped green roof. The visual impact of the two large ice-rinks and accompanying sports program was thus reduced, opening up views, saving energy and providing 0.6 hectare of additional green space adjacent to the existing Westmount Park. The new green roof design follows the picturesque "English garden" style of the existing park as a seamless extension thereof.

Apart from the main entrance and exit pavilions on the surface of the green roof, this landscape-integrated approach of concealment became a defining feature of the project.

Centrally located between the ice rinks, and adjacent to the parking arrival from Sainte-Catherine Street, the main entrance pavilion is the physical and visual link between the park, sports program and pool levels. A secondary entrance is located off Lansdowne Avenue at pool level with access to the seating area of the ice rinks, visible through the interior curtain wall though located one level below.

The WRC's design exploits the site's natural terrain that slopes both from north to south and from east to west. The site was divided into an upper [green roof] garden and a lower [pool level] terrace, creating daylight opportunities on the two exposed façades facing wetland south. While the two rinks are nine metres underground, the youth centre, exercise rooms, administration offices, and changing-rooms are only partially underground with natural light.

Overall, building underground lowers operating costs as less energy is needed for heating, cooling, and maintaining ice: at nine metres depth the temperature is a constant 15°C year round. On the other hand, however, a much stronger structure was required. The below-grade perimeter walls are of 0.8-metre-thick reinforced concrete, with 1.4 metre deep steel beams spanning the 32-metre width of each ice-rink which need to be column free.

The outdoor pools [one competition-standard pool and one wading pool] were then strategically located on the lower south terrace with enough room for a transitional visual and acoustical buffer to Sainte-Catherine Street below which consists of a landscaped stormwater retention pond. The stormwater is not only retained on the surface, but also retained underground. The underground storage uses continuous true elliptical arch chambers with no bottoms which allow the stormwater to infiltrate into the ground, thus helping the stormwater management of the site.

**PROJECT CREDITS**

**OWNER** City of Westmount
**CLIENT/GENERAL CONTRACTOR** Pomerleau
**ARCHITECT** Martin, Marcotte - Beinhaker architects and Marosi + Troy architects in consortium
**STRUCTURAL/CIVIL ENGINEER/LEED CONSULTANT** CIMA+
**MECHANICAL/ELECTRICAL ENGINEER** Beaudoin Hurens
**LANDSCAPE ARCHITECT** Groupe IBI/DAA
**PHOTOS** Nicolas McComber

**PROJECT PERFORMANCE**

- **Energy intensity [building and process energy]** = 1,124MJ/m²/year
- **Reduction in energy intensity relative to reference building under MNECB** = 52%
- **Potable water consumption from municipal sources** = 6,980L/occupant/year
- **Reduction in potable water consumption relative to reference building** = 40%
- **Demolition materials diverted from landfill** = 95%
- **Regional materials [800km radius] by value** = 30.7%
- **Reclaimed and recycled materials by value** = 26.5%

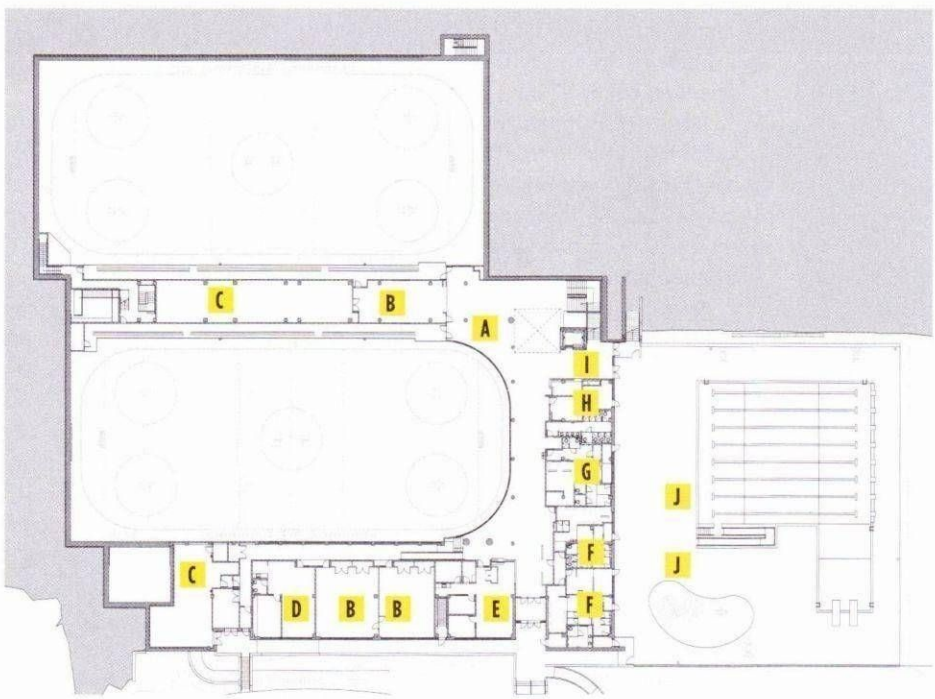
2


3

**MATERIALS**

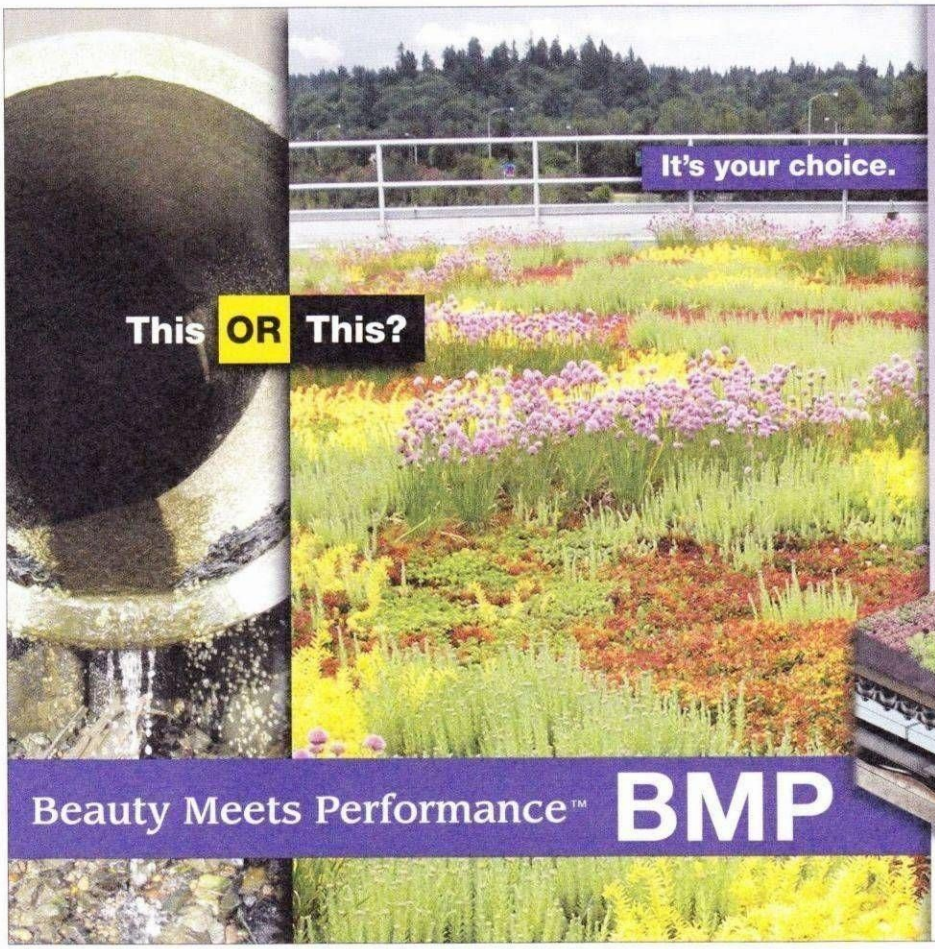
- Steel and concrete construction with curtain wall, Norman-size red-clay brick cladding and zinc roof.
- Insulation partly supplied by **Roxul** and **Owens Corning**.
- Vegetated roof by **Hydrotech**.
- HVAC consists of heat recovery ventilators, heat pumps, chillers, air-conditioning units and radiant floor heating.
- Waste heat recovered from the ice rink refrigeration system heats the adjacent spaces and incoming fresh air, preheats the domestic hot water, and the outdoor pool throughout the summer.
- LED fixtures used for the rinks.

**▶ ▶ ▶ Watch for the SABMag web-based case study of this project, sponsored by Roxul. Details to come.**




**Floor plan pool level**

- **A** Agora
- **B** Multi-purpose room
- **C** Mechanical
- **D** Youth centre
- **E** Administration
- **F** Locker room
- **G** Family locker room
- **H** Concession stand
- **I** Reception
- **J** Pools

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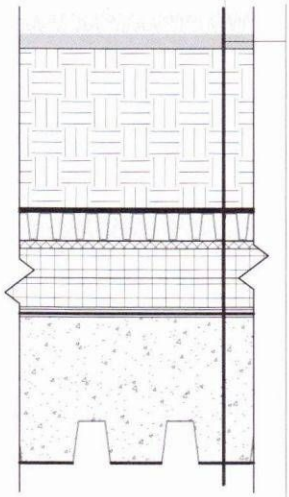

**GREEN ROOF COMPOSITION**

- Vegetation
- Growing medium
- Geotextile membrane
- Drainage panel with extended clay
- Filter fabric
- Fill insulation as required
- 100mm Type A4 insulation [2 layers of 50mm]
- Root barrier
- Protective membrane
- Type 2 roofing membrane with separation sheet
- Primer
- Concrete slab on sloped structural steel

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THE POOL AREA IS LOCATED ON THE LOWER SOUTH TERRACE OF THE COMPLEX, CLOSE TO SAINTE-CATHERINE STREET [2]. THE ICE RINKS ARE SUNK 9M INTO THE GROUND SURROUNDED BY SUBSTANTIAL CONCRETE RETAINING WALLS. AT THIS DEPTH, GROUND TEMPERATURE IS A STABLE 15 C° YEAR ROUND [3]. A GLAZED ATRIUM ENABLES LIGHT TO PENETRATE TO THE LOWER LEVELS OF THE BUILDING [4]. VIEW OF ENTRANCE, WITH GLAZED DOORS TO PARK [5]. CUTAWAY RENDERING SHOWING HOW THE BUILDING EXPLOITS THE CROSS-SLOPE OF THE SITE TO CREATE A LOW PROFILE AND PRESERVE VIEWS OF THE PARK FROM THE SURROUNDING NEIGHBOURHOOD [6].

Ice rink refrigeration systems produce a significant amount of waste heat as they operate continuously to freeze the ice. At the WRC, however, this waste heat is recovered and used for heating the adjacent spaces and fresh air [$CO_2$ sensors monitor the air quality inside the building], preheating the domestic hot water as well as heating the outdoor pool throughout the summer. This abundance of recovered heat negates the need for a geothermal system.

The building will not generate greenhouse gases since the electromechanical systems consume no fossil-fuels.

Rather than the more commonly used metal-halide or fluorescent [T5] lighting for rinks, the WRC uses LED fixtures which also significantly contribute to the energy efficiency of the building.

The overall scale and character of the "garden pavilions" draw inspiration from Westmount's rich heritage of traditional architecture, including that of the exceptional Murray Hill Park pavilions as well as the adjacent Westmount Park pavilion to the north of the new WRC. The style of the new pavilions feature the trademark broad and elegantly proportioned hipped roofs with large protective overhangs and covered porches, appropriate to garden structures.

The new pavilions are clad in a Norman-size red-clay brick [75mm longer than a standard brick] and covered by metallic zinc roofs. Generous curtain wall glazing around the main entrance pavilion allows daylight to penetrate through a central atrium to the heart of the spaces below, including a public agora at the pool level. A glazed garden café and outdoor covered terrace overlook the landscaped roof and the existing park beyond.

The final result, following a compressed 18-month construction period, is a bold and innovative solution which optimizes and promotes the best topographical and contextual features of the site and the park while providing Westmount residents with high performance, functional and stimulating communal and sport facilities.

SHAWN MOSCOVITCH, OAQ, OAA, PA LEED® O+M IS AN ARCHITECT WITH MARTIN, MARCOTTE-BEINHAKER ARCHITECTES, S.E.N.C. AND ERIK MAROSI IS OAQ IRAC AAPPQ, PRINCIPAL.