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Garden Roof Augments Vancouver Heritage Building Redesign

By Bruce Duncan, American Hydrotech, Inc.

From a one-storey distribution warehouse to a 10-storey high-end commercial property, 564 Beatty Street in Vancouver's eastern downtown district has seen a lot of change in its 106-year history. Fortunately, the design team, contractors and owner/developer involved in this transformation project had the vision and talents to deliver an exceptional property.

Although designated as a heritage building, the design team overcame the challenges inherent when working with older construction techniques and delivered a creative solution. The result is a contemporary four-storey addition atop the existing six-storey heritage building (see photo to the right).

One strategy used to move from a Class B 'Brick and Beam' designation to a Class A designation with contemporary offices and high-end restaurant space was to incorporate three garden roofs in the new addition. The largest garden roof on the 10th floor offers views on three sides and is accessible from the amenity room (see Figure 1 on page 40). A second garden roof is located on the roof amenity building and the third garden roof is over the utility area. These last two garden roofs are generally only visible from surrounding high-rises.

ADDING VALUE WITH A GARDEN ROOF ASSEMBLY

Green or garden roof design is not new, but increasingly owners, developers and even municipalities are requiring green roofs. For 564 Beatty Street, Reliance Properties Ltd. and the architectural team have applied for LEED Core and Shell Gold certification. To meet the



The new four-storey contemporary addition brings the 1909 heritage building into the 21st century. Photo courtesy of Glen Stokes, Bruce Carscadden Architects Ltd.

storm water treatment Sustainable Site credit, the green roof must be at least 50 per cent of the total roof surface or 2,800 square feet.

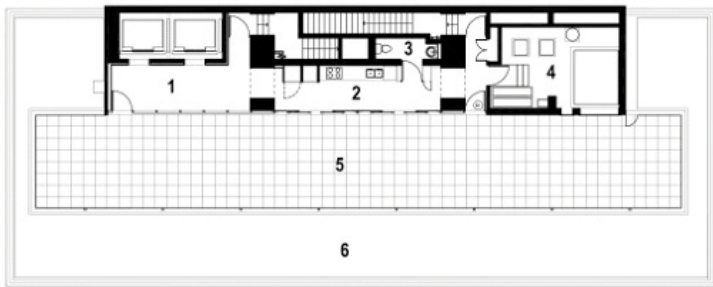
"The owner wanted to offer low energy and sustainability as a marketing position, so the three green roofs were an obvious solution," says Glen Stokes, project architect at Bruce Carscadden Architect, Vancouver, B.C. Situated in a row of other heritage buildings and in an increasingly upmarket area, this approach helped 564 Beatty stand out. This ability to attract a top-end restaurant with an outdoor patio on the ground floor, as well as other

high-end, long-term tenants, shows the wisdom of the strategy.

In addition to being a marketing feature, green—or garden—roofs offer a host of other technical benefits including substantially reduced storm water run off, a lower urban heat island effect and cooler buildings in the summer.

There are also the 'softer' intangible benefits of a garden roof to consider. As Rob Willemsen, president of JR Troy and Company Ltd., the project's roofing contractor says, "It's a great place to take a moment to refresh and reflect before heading back to your busy desk."





- 1 Elevator lobby
- 2 Kitchen
- 3 Washroom
- 4 Mechanical
- 5 Rooftop patio
- 6 Extensive green roof

Figure 1: The extensive garden roof on the Amenity Room level (#6) wraps the patio deck on three sides. Figure courtesy of Glen Stokes, Bruce Carscardden Architects Ltd.

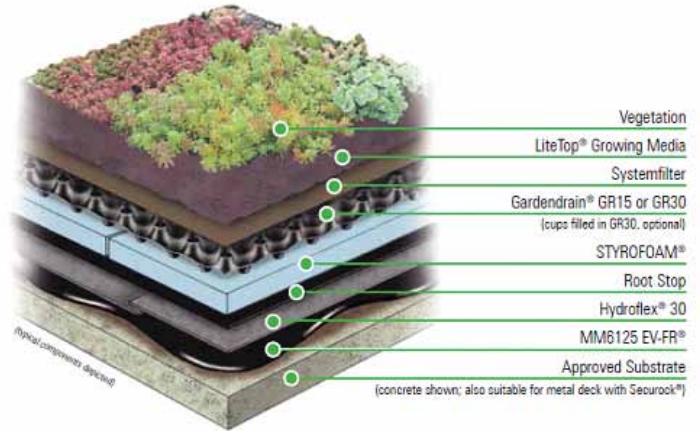


Figure 2: Extensive garden roof assembly used one-foot by two-foot sedum carpet mats designed for year round visual interest. Figure courtesy of Hydrotech Membrane Corp.

DIGGING INTO THE DIRT

The three-sided main garden roof design on the amenity level offers expansive and uninterrupted panoramic vistas. The patio deck is approximately 18 inches higher than the surrounding garden roof and the two surfaces are separated by a clear balustrade. With only a three-inch band with a unique extruded aluminum edge detail around the outside perimeter, the look from the patio deck is almost like a green infinity pool.

“The green foreground reminds you of the sustainable qualities and attributes of the building and grounds you as you look across to the mountains,” says Glen Stokes.

A seamless, hot fluid-applied rubberized asphalt roofing membrane (Hydrotech Monolithic Membrane 6125®EV) was installed on the entire concrete roof deck, delivering a tough and flexible waterproofing layer. Three times thicker than most other waterproofing membranes, it can self-heal and bonds well with the underlying substrate.

“Having an excellent bond is key. If any damage does occur—say by another

trade—water won’t travel under the membrane,” says Rob Willemsen, a certified Hydrotech Membrane contractor for close to 40 years. The membrane contained at least 25 per cent recycled product to enhance the sustainability of the overall design.

Under the garden roof, a protection layer or root stop was installed to prevent roots from potentially penetrating the waterproofing/roofing membrane before laying the four-inch (100 mm) of two-inch by eight-inch (600 mm by 2.4 m) shiplapped STYROFOAM™ Brand ROOFMATE™ insulation. This approach of protecting the membrane with the insulation helps extend the life of the roofing assembly.

The garden roof design used a recycled polyethylene molded drainage/retention sheet (Gardendrain™ 15). Specifically designed for extensive garden roof designs, the drainage layer incorporated retention cups with drainage channels to support ventilation and evaporation (see Figure 2). The drainage layer was loose-laid over the insulation and held in place with four

inches (100 mm) of growing medium and the sedum carpet tiles.

“We also used a drip irrigation system below the plant materials in a one-foot grid to supplement the rainwater capture, as needed,” says Adam Harris, estimator and project manager at Blue Pine Enterprises, the garden roof installer.

The sedum carpet tiles were specially selected to provide vibrant colour interest year-round, with a blend of up to eight sedums that offer a variety of flower colours and flowering times. The aptly named Etera® Color Max one- by two-foot (300 mm by 600 mm) tiles provided immediate cover, even when installed in March and now only need minimal maintenance.

All the components—from the monolithic membrane to the sedum carpet mat—work as a system, backed by years of experience and manufacturer’s warranty. “Our customers recognize and value the convenience of a single source warranty, as offered by Hydrotech. Because we cover all the roofing components, we can warranty such items as membrane



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watertightness and insulation R-value retention,” says John Riley, owner of Inter-Coast Building Solutions Inc., the Hydrotech representative in Western Canada. “With other systems, owners might have to go to the individual component supplier/manufacturers to get service.”

PUTTING THE GARDEN ROOF TOGETHER

The construction phase required close co-operation between trades to ensure that work was completed on time and to the high quality specifications—especially that of the roofing and landscape contractors. For example, all of the roofing components, except the sedum carpet tiles, were lifted onto the amenity floor roof by the construction crane and were staged accordingly. The two contractors worked closely together building up the garden roof assembly.

“As JR Trory’s team was laying the membrane, we followed closely behind to lay the root stop. Then the roofers laid the insulation so we could then build up the rest of the roof,” says Harris.

When the pallets of sedum carpet tiles arrived in a refrigerated truck to the jobsite, because the construction crane had been removed, a portable crane was used to lift the material up to the garden roof area. To minimize any damage to the carpet tiles both during installation and in the early days of growing, garden area foot traffic was limited.

AWARD WINNER

With just under a year of occupancy, this mixed-use building at 564 Beatty Street continues to garner rave reviews and awards. The Urban Development Institute (UDI) Pacific Region gave it two awards in late November 2014: Best

Heritage and Best in Show. In addition, it won the Vancouver Regional Construction Association’s 2014 Gold Project Winners in the Heritage Award category.

Awards aside, perhaps the biggest winner is how 564 Beatty Street has enhanced Vancouver’s built environment from the patio green space at street level to the uppermost three garden roof spaces. The result demonstrates how a “green” solution benefits everyone. As Riley says, this project “honours the past, extolls the present and celebrates the future.” The vibrant and creatively-designed garden

roofs will continue to bring beauty and a place for reflection for years to come. ■

Bruce Duncan is both the International Sales Manager for American Hydrotech, Inc. and the Regional Manager for Ontario and Western Canada.

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564 BEATTY STREET AT A GLANCE

- Green roof system: Hydrotech Green Roof® Assembly extensive design.
- Developers / owner: Reliance Properties Ltd.
- Architect: Bruce Carscadden Architect Inc.
- Landscape consultant: IBI Group, Vancouver.
- Landscape contractor: Blue Pine Enterprises Ltd.
- Roofing contractor: JR Trory and Company Ltd.
- Growing mat supplier: Etera®/ Northwest Horticulture LLC

