

THE ARMATURE – DOWNTOWN EDMONTON, ALBERTA

Improving water quality with green infrastructure in downtown Edmonton



In 2013, the city of Edmonton in Alberta, Canada began the process of revitalizing its downtown district known as The Quarters Downtown and improving drainage services throughout the neighborhood. A primary component of the project was the creation of The Armature, a pedestrian-oriented streetscape corridor that runs through downtown and connects the four unique districts that make up The Quarters.

The Quarters Downtown is a 100-acre (40 hectare) neighbourhood that extends from 97 Street to 92 Street, and from 103A Avenue to North Saskatchewan River Valley. The street is the city's first "green street" and integrates sustainability and LID into the streetscape and surrounding public space to reduce stormwater runoff feeding into the North Saskatchewan River.

4,380 Silva Cells were installed on both sides of the roadway to provide uncompacted soil volume for roots beneath hardscapes. The cells also provide stormwater management

along the East side of 96 Street through interception and evapotranspiration via the 148 total trees that benefit from Silva Cells and increased soil volume. The nearly 1,238 cubic meters (43,740 cubic feet) of soil has the capacity to handle 25 mm of stormwater runoff, which is equivalent to a two-year, four-hour storm event.

Runoff is collected in catch basins where sediments settles and are cleaned out throughout the year. The water then flows through perforated pipes along the upper layer of the Silva Cells to provide water for the trees above. Excess water is collected by a second perforated pipe along the base of the Silva Cells and is led to a downstream sewer.

"Silva Cells were used for their ability to achieve water quality treatment goals as well as to grow large and mature trees. Nature-based systems are, by far, the best ones available to us," said Russell Barth, Senior Water Resources Engineer at ISL Engineering, the firm behind the project.



City staff are monitoring both hydrology and water quality as well as how winter snow and ice removal practices are impacting trees and soil. Monitoring occurs via a flow monitor at the underdrain discharge and samples from the street. Current monitoring data for the installation has provided some early indication supporting expectations for flood events. The largest single monitored event on July 15, 2016 seems to show a peak flow and volume reduction for that event (72% and 35%, respectively), which can be characterized as a 1:25 year flood event.

The hope is that over time, projects such as The Armature will assist in attracting more growth to the downtown Edmonton, helping transform the city's landscape and encouraging a more vibrant, diverse community.

Installation Summary:

Average soil volume per tree: 15 m³

Number of Trees: 90

Total Silva Cells: 4,380 Frames, 1,830 Decks

Installation Date: 2013

Installation Type: Integrated—Trees and Stormwater

Project Site: Municipal/Government

Project Designer: ISL Engineering

Contractors: PCL Constructors Canada Inc. and Heritage Nurseries Ltd.

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