'Green' wall a living, breathing divider

Panel of plants a pretty alternative to concrete that provides shade

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There are a lot of reasons to get excited about Randy Sharp's "green wall."

Not only is it the first "permanent living wall in North America," according to Sharp, a Vancouver landscape architect and green roof expert, it is also the first all-green facade to be composed entirely of native plants.

But what is most thrilling about this wall of plants at Vancouver Aquarium's new Aquaquest Learning Centre is that it offers a natural, lush, serene green alternative to a plain, boring concrete wall.

Imagine how the city would look if more of these self-sustaining ecosystems were used to replace great expanses of concrete that invariably become dirty and cracked and are often used as canvases for graffiti. Sharp says there are many other benefits to a green wall.

"It helps to shade the building in summer, reduces glare and noise, and it can extend the life of the building by reducing deterioration caused by ultraviolet rays," he says.

"These walls also become habitat for insects and birds. They are also much more pleasing to look at than a concrete wall."

Green walls also contribute to reducing the phenomenon known as "heat island effect," which is what happens when a city is significantly warmer than its surroundings, Sharp says.

Green walls and green roofs can draw cooler air from the mountains that in turn can flush air pollution from the city, as well as reduce the overheating that is suspected of contributing to global warming.

The Aquaquest wall is three metres by 15.2 metres and includes about 7,000 plants, all neatly tucked into individual containers as part of a modular grid system fixed to steel braces attached to the wall. It is estimated to have cost $50,000.

Sharp says the biggest challenge was to come up with a system that was not too heavy. He originally looked at adapting existing green roof technology using lava rock and pumice.

But then he travelled to the World's Fair in Aichi, Japan, in 2005 and saw a 12- by 152-metre wall featuring 30 different green-wall technologies.

One of them is the kind being used at the Aquaquest centre. The modular panels make it possible to lift any section of the wall and replace the plants if they die or develop problems.

However, the plant selection was specifically made to make the wall a self-sustaining ecosystem.

"We started by envisioning the wall as a cliff face and we thought of all the plants you would find growing naturally on a canyon face on the North Shore," says Sharp.

He eventually reduced the list to a total of eight species of coastal native plants: Dicentra formosa (Pacific bleeding heart), Dryopteris expansa (spiny wood fern), Fragaria vesca (woodland strawberry), Gaultheria procumbens (wintergreen), Polypodium glycyrrhiza (licorice fern), Tellima grandiflora (fringecup), Tiarella trifoliata (foamflower) and Vaccinium ovatum (evergreen huckleberry).

Since the wall has an eastern exposure, it will receive morning sun and afternoon shade, the ideal conditions for the mostly shade-loving woodland plants.

The planting design features a series of wave-patterns. This sculptural pattern is more discernible from the placement of the bleeding hearts and tiarella than the ferns and strawberries, but Sharp thinks that, as the wall matures and the seasons change, the wave-like tapestry will become more obvious.

Rainwater will be collected on the roof of the building and used not only to water the green wall but also to refill freshwater fish tanks and to flush toilets.

Above: Landscape architect Randy Sharp designed this "green wall" for the Aquaquest Learning Centre at the Vancouver Aquarium. Rainwater collected on the roof of the building is used water the wall's plants.
Left: Workers neatly tucked 7,000 plants into individual containers as part of a modular grid system fixed to steel braces attached to a backing wall.
Handout photos/CanWest News Service

Sharp says a series of irrigation lines run through the wall to water plants when they need it, as well as give them any fertilizer they may need.

"The experience in Japan is that the plants eventually form a tight root mass and become a self-sustaining ecosystem requiring minimal maintenance," says Sharp.

Three pots containing the redbud crabapple (Malus x zumi 'Calocarpa') have been placed on the roof and a native garden, composed mostly of ferns and mahonia as well as another redbud crabapple, has been installed at the Aquaquest centre's entrance.

Sharp, who has done dozens of green roofs in Vancouver, is working on a major fern-wall installation for the terminus of the Canada Line at Vancouver airport's international terminal. He expects it will be done by the spring of 2008.