***Water Sky Garden* at Richmond Olympic Oval**
City of Richmond, B.C., Canada

Fact Sheet

Purpose:

- Create compelling new civic space that is both beautiful and contemplative, and encourages people to spend time in shared public space.
- Provide circulation and connectivity between main roads/parking to the architecture and to the waterfront (Fraser River).
- Reference multiple local cultural communities with art to create new civic icon.
- Make "wind choreography" visible to the human eye using netted sky lanterns that are suspended in space and encourage movement of the visual landscape up towards the sky.
- Create water garden with fountains that serves as a wetland treatment pond, providing storm water retention, water quality treatment, and water storage for irrigation use.
- Incorporate water garden planting elements that absorb heavy metals; prevent siltation and remove other impurities from water; provide native habitat for birds; mammals and aquatic life; and recreate an authentic native wetland garden experience for visitors.

Location: Richmond Olympic Oval, an official venue for the 2010 Vancouver Olympic Winter Games

Client: City of Richmond, B.C., Canada

Budget:
Art: Net components, structure, related fees: $1.2 million
Pond, boardwalk & bridges, fountains, lighting: $2.4 million (approx.)
Excavation, grading, utilities, and plantings: $4.1 million (approx.)

Completion: June 2009

Artist: Janet Echelman, Janet Echelman, Inc. www.echelman.com

Press Contact: Rachel Newsam, Janet Echelman, Inc.: (617) 566-0770, rachel@echelman.com

Design Team:
Janet Echelman, artist
Hotson Bakker Boniface Haden, architects and urbanistes
Phillips Farevaag Smallenberg, landscape architecture
Fast + Epp, structural engineering
Buro Happold, net engineering
Peter Heppel Associates, aeronautical engineering
Speranza Architecture, consultant
Cole Brown Henry Consulting, public art consultants
Vince Helton and Associates, fountain mechanical
Joseph Scott, lighting design

Description:

Visitors approach by a red boardwalk and intersecting bridges over a new water garden. Above their heads, visitors see the red netted forms moving in the wind; below they see "water drawing" amidst the reflections in the pond. The environmental component, however, remains

invisible: this project, a collaboration between the artist, urban designer, landscape architect and site team, takes the run-off water from the Olympic Oval's 5-acre roof and cleans it through its aerating system and plant selection.

The red boardwalk and "sky lanterns" are inspired by the city's cultural communities. Richmond has the largest immigrant population by proportion of any city in Canada with the majority of those immigrants being of Asian descent. The wooden boardwalk follows a curving path similar to the choreography of the Dragon Dance, a performance frequently seen in local Chinese festivals. The Nitobe Japanese garden and the Sun Yat Sen Chinese garden of the Vancouver region are important references, especially their material presence, intersecting paths and reflective ponds, and their framing of views. *Water Sky Garden* is a contemplative art environment that encourages participants to linger. The overhead netted forms provide a new visual experience, putting art in the sky. Made of colorfast 100% ultraviolet resistant expanded PTFE fiber nets, they are transparent and integrate with the landscape they inhabit, allowing viewers to look at them and through them at the same time. At night, they glow like lanterns. Nets have a special relationship with the site, as the native Musqueam Band continue to teach their children to fish using nets at this particular bend in the Fraser River to this day, and this area has a history of the fishing/canning industry which employed many ethnic groups.

Materials:
The sky lanterns are suspended from painted galvanized steel rings from which a GORE™ TENARA® Architectural fiber net form is hung. TENARA® is made of expanded polytetrafluoroethylene, or ePTFE, a highly durable material that can also be found on the outside of US space suits. The bridge is made of red painted cedar, and the "water drawing" fountains blow tiny air bubbles to help clean the water.

Size and Arrangement:
Total area of *Water Sky Garden:* Approximately 75,000 sq. ft.

Length of Wooden Boardwalk: 300 ft.
Length of Pedestrian Bridges: 2 @ 52 ft. each
Total length of pedestrian link from Legacy Plaza (south) to Spirit Square (north): 725 ft.

East Net Armature:
Largest diameter: 75 ft.
Highest Point on Armature: 50 ft. Above Grade
Galvanized Steel Pylon Height: 82 ft.
Net Depth: 25 ft.

1070572.34 in. of twine = 16.89 miles of twine
271 lbs.
115,910 knots
946644.115 sq. in. area = 6,573 sq. ft.

North Net Armature:
Largest Diameter: 52 ft.
Highest Point on Armature: 40 ft. Above Grade
Galvanized Steel Pylon Height: 66 ft.

Net Depth: 20 ft., with a 14 ft. tail down to the water below

1005205.2 + 110056.36 = 11152611.56 in. of twine = 17.6 miles of twine
286 lbs.
51404 Knots + 10449 Knots = 61,853 Knots
914491.991 sq. in. area = 6,350 sq. ft.

Net-Sculpture Info:

The "sky lantern" nets are the result of a detailed, computer-assisted process that ensured that their shapes and wind movement corresponded with Echelman's vision. The design process for the nets was a further development of Peter Heppel Associates' process for Echelman's piece *She Changes* (2005) in Matosinhos, Portugal. The process began with 3-D digital sketching in Maya, and Buro Happold engineers developed new computer software in collaboration with Peter Heppel Associates to translate these forms into a CAD package in order to define their surfaces and build their geometry. This new model is exported into Buro Happold's form finding software to find the deflected shape of the assembled net sculpture under the effects of gravity. Wind analysis of this model conducted by Buro Happold and Peter Heppel Associates provided information necessary to determine the twine tenacity required for each loomed net panel. This information is then translated into construction drawings that specify the exact looming patterns for fabrication, including the description of color information for each individual bobbin, and the varying lengths of the meshes for knotting, hand baiting, and hand splicing.

The fabrication involves a series of North American industrial factories integrated with hand-craftsmanship. The trades involved steel fabrication, fiber generation, twine braiding, commercial fishing net production, handcrafting, and installation within a complex landscape. Diamond Nets, of Everson, WA, overcame significant design challenges to produce the nets. The firm's craftsmen effectively translated Buro Happold's sophisticated digital models into analog crafts of hand-knotting, hand-splicing, and hand-baiting skills that fishermen and lacemakers have practiced for millennia.

Bridge Info:

The red, wooden boardwalk is meant to provide a terrestrial connection between *Water Sky Garden* elements and the plane of the landscape. It hovers above the water surface appearing to float on water, allowing the visitor to meander through a native wetland garden and provide more direct connections between the building and Hollybridge Way.

Seating, bridges, Musqueam rocks anchored in the pond edge provide places to pause. The boardwalk is lit using LED spotlights that highlight the red color of the deck surface and reinforce the connection to the sky lanterns above.

Water Garden Info:

Water Sky Garden includes a wetland treatment pond located between the Oval building and Hollybridge Canal. The pond is designed to meet various objectives, including:

- Storm water detention
- Water quality treatment, and
- Water storage for irrigation use

The pond transforms from a harder urban condition at the building to a softer more natural edge at Hollybridge Canal. Functionally, the pond captures rainwater from the Oval roof, the surrounding landscape and site surfaces, detaining the water before overflowing to Hollybridge Canal. The

water collected in the pond is re-circulated and used for irrigation of planting, and thereby help reduce demands on potable water. If required the pond may collect water from the Fraser River through the activation of manual valves in the pump chambers.

Fountain Info:

Aeration provided by the *Water Sky Garden* fountains assist with facilitating the oxidation of dissolved metals, in particular iron. The oxidation process creates flocculent metal precipitates that will mostly settle to the bottom or attach to the surfaces of aquatic vegetation. Aeration also prevents stagnation of the water within the system, allowing the persistence of a relatively natural aquatic ecosystem.

The specific components of the City's Environmental Assessment Report (EAR) that the pond addresses are:

- Maintain post development runoff rates and quantities at pre-development levels;
- Incorporate Best Management Practices (BMPs) to help achieve LEED® silver rating;
- Treat storm water to remove 80% TSS and 40% phosphorous levels;
- Reduce potable water use by 20% to 30%; and
- Protect or enhance foreshore and riparian areas.

The BMP's incorporated into the water management strategy design include:

- A large detention pond, infiltration galleries, and roof water retention and reuse to maintain post development runoff rates and quantities at pre-development levels;
- A wetland treatment pond and infiltration galleries to achieve water quality goals;
- Storm water retention and treatment in the pond; and
- Minimizing ground water discharge.

Plant Info:

50% of the site is planted with native or adaptive species. The role of plants in *Water Sky Garden* is:

- To absorb heavy metals, prevent siltation and remove other impurities from water;
- To provide native habitat for birds, mammals and aquatic life particularly widening the existing wildlife corridor along Hollybridge Canal and the larger Fraser River corridor; and
- To recreate an authentic native wetland garden experience for visitors to the Oval and create opportunities for interpretation of the Fraser delta landscape.

More Information:

http://www.richmond.ca/discover/events/oval/oval.htm
http://www.pfs.bc.ca/html_proj/proj_amenity.shtml?05

Biography:

Janet Echelman
Through her art, Janet Echelman reshapes urban airspace with monumental fluidly-moving sculpture that is choreographed by nature. "My sculpture thrives in the context of the city, interacting with people in the course of their daily lives. These monumental netted sculptural environments move through time, animated by an ever-changing "wind choreography," making invisible air currents suddenly visible to the human eye. I make living, breathing pieces that respond to the forces of nature – wind, light, water."

The artist premiers *Water Sky Garden* at the 2010 Vancouver Olympic Winter Games located at the Richmond Olympic Oval, official venue for speed-skating events. This project takes run-off water from the building's 5-acre roof and transforms it into a water garden intersected by red curved pedestrian bridges, "water-drawing" aeration fountains, and red "sky lanterns" that respond to the wind.

In 2009, she completed the largest publicly funded art commission in America of that year: the new civic icon for Phoenix, Arizona, *Her Secret is Patience*, a 145-foot-tall sculpture that makes the pattern of desert winds visible to the human eye and casts intricate shadow drawings onto the ground.

Portugal is home to Echelman's recent *She Changes*, a 160-foot-tall waterfront netted wind sculpture suspended above a 3-lane highway roundabout, which received the IFAI International Achievement Award and the Public Art Network's Year in Review Award, and was called "one of the truly significant public artworks in recent years" by Sculpture Magazine. Her team won the Hoboken September 11th Memorial competition, which will result in construction of a new freestanding island in the Hudson River.

Exhibitions of her painting, prints, and sculpture have been held in Venice, Madrid, Bombay, Jakarta, Hong Kong, Kyoto, and New York City. Recipient of the Harvard GSD Loeb Fellowship, the Aspen Institute Henry Crown Fellowship, a Fulbright Lectureship, as well as grants from New York Foundation for the Arts, Pollock-Krasner Foundation, Japan Foundation, and Rotary International Foundation, and this year from the Massachusetts Cultural Council which selected her for Artist Fellowships in two categories, "Sculpture/Installation" and "Craft." The MCC said this is the first time an artist was selected in both those categories in the same year. She currently serves on the national board of the Fulbright Association, and the Aspen Institute Energy and Environment Awards.

After graduating from Harvard College in 1987 with Highest Honors in Visual Studies, she received graduate degrees in painting and in psychology. From 1988-1993, Janet lived as an artist on the island of Bali, Indonesia, before moving her studio to New York City. In 2007, she moved to Brookline, Massachusetts to begin the Loeb Fellowship at Harvard University Graduate School of Design.