

*The design team for a new, elite Speed Skating Oval in Richmond, B.C. Canada, had a threefold goal – to make the project iconic, on time and on budget for Vancouver’s 2010 Winter Olympics.*

**Richmond’s medal finish**, by Toby Mallinder, MRICS

The design brief was as ambitious as the client was clear. The Vancouver 2010 Winter Olympic Speed Skating Oval would not only be functional and flexible as a venue and future legacy building, but it would also be an icon of design – beautiful, sustainable and poetic.

Not to mention, delivered on time and on budget.

Today, the flagship Oval is nearing completion, soundly within the original feasibility parameters of approximately \$180million CDN with occupancy on track, well over a year shy of the opening date of the Games in February 2010.

For the Project Manager, Marion LaRue, a Principal at Cannon Design in Vancouver, it seems almost too good to be true. So much so, she has deconstructed the entire process as a valuable lesson for her own firm as well as endorsement for the merits of the integrated design process, a key driver of this project’s success.

“Fortunately, we have a client with enough foresight to hire an entire project management team and who also saw value in having a regular estimating process throughout design and documentation phases,” says LaRue.

Not surprisingly, her client, the City of Richmond, was keenly committed to staying on budget. To that end, according to LaRue, they were willing to listen to all ideas and innovations that supported both programmatic and financial objectives.

“Having a client that understood the value of the integrated design process in particular was critical,” says LaRue. “Having an excellent Quantity Surveyor (QS) on board (in this case, BTY Group, one of Canada’s most experienced cost management consultancies) throughout the entire process made meeting the functional, aesthetic and budget objectives more feasible.”

Situated on a challenging site near the Vancouver International Airport, the purpose-built waterfront facility has multi-functions. To serve as the 400m speed skating track during the Olympic Games, it consists of two 4m competitive lanes, a 5m warm-up lane, with seating for 8,000 spectators. The versatile facility also includes a fitness centre, athlete testing area, cardiovascular rehabilitation centre, wellness centre, sports medicine centre and concessions.

After the Games, uses for the facility must remain flexible. It has the potential to house multiple arenas, combined ice and field uses, with open, bare-slab floors for convention and meeting space. Due to the multitude of future uses, technical considerations have been complex, with foundations and structural components designed to ease conversion post Games.

Throughout its lifecycle, the building is envisioned as a community and international gathering place, a new icon for the City of Richmond and the catalyst for development of one of its most prominent and environmentally sensitive riverfronts.

In addition to the broad programmatic objectives, the project's sustainability target, set by the Vancouver Organizing Committee (VANOC) is bold: to achieve Leadership in Energy and Environmental Design (LEED®) silver certification or better standards, a challenging goal for this particular building type.

"This project doesn't fit the typical LEED® profile because the standards were originally established for commercial buildings such as office towers and highrise residential," notes LaRue.

The Oval may be considered a precedent-setting LEED® project for sports facilities in terms of simplifying application of the standards in the future, she hopes.

Critical to keeping the entire project on track, especially during Vancouver's hot construction climate was a move to shift the usual role of Quantity Surveyor from the sidelines to become an active participant in the overall design and construction team.

"BTY totally understood the construction market that we were in," notes LaRue. "They have an excellent grasp of where markets are headed and they are an essential partner in terms of strategically planning how to design and construct the building in that context."

"The fact that we were involved from the start to the end of the project made the difference," says Joe Rekab, Managing Partner of BTY Group. "On many projects, the QS is appointed at the beginning of the process, and then dropped at the 60-70% stage."

But in this case, with the management of the Olympic Oval's project costs as a priority, within a capricious construction market, the client and architect insisted BTY Group cost management team be involved through all phases of the project.

BTY's experience on previous Olympic and Commonwealth competition venues paid off as well.

"Based on our experience working on the Calgary Olympics in 1988 and Victoria Commonwealth Games in 1994, we knew that preparation for such major events sparks a spike in local construction costs over time," says Rekab. "Estimates and recommended contingency allowances for design, construction and escalation changes were calculated based on the results of detailed risk analysis modeling, while a project risk register was

used as a key cost management tool which allowed for informed adjustments to estimates, schedules and contingency allowances.”

“BTY’s cost management team undertook rigorous and comprehensive cost studies for every possible design option in the early design stages,” says La Rue. “Preliminary estimates for the selected design were carefully developed into an approved Cost Plan which was used as a reference and framework for the management of costs through the future design and construction phases of the venue.”

Addressing costs in this way at that early phase allowed for a cost management process which resulted in the delivery of the venue within the client’s original affordability limits, she notes.

Because of the size and duration of the project, a sequential tendering process was employed. There was intense coordination as each contract was awarded with appropriate contingencies in place for the inevitable price creep.

Ultimately, the project team leadership through Cannon’s commitment to an integrated process from the original winning proposal, through to construction, was a vital element in the project’s success, contends Rekab.

“We needed the QS team at the table to understand the systems well enough to recognize associated costs,” notes LaRue. “They helped us to design and develop the right solutions, the right materials, the right priorities.”

“As Quantity Surveyors, very often we are retained from the inception of a project through to mid-life ‘crisis’ and then dropped as a fee-saving measure,” says Rekab.

But this team saw the added-value of firmly integrating QS services through the complete design and construction cycle.

“Here we have a cradle-to-grave relationship with a project that is a resounding success,” says Rekab. “The full integration of all consultants has proven to be a winning combination.”

With a challenging mandate to create an iconic piece of architecture, overall design values were also elevated to exceptional international standards. Remarkably, the final expression has surpassed even the most ambitious conceptual expectations.

With outlooks over the waterfront and beyond to the mountains, the design is evocative of the mighty Fraser River, its delicate estuary and a key resident, the heron. The north-east façades features generous glazing, flowing artworks and unique winged edged accents supporting the design poetic described as *flight-flow-fusion*.

“The design sketches, perspectives and the 3-D modeling gave us an idea of what this building would look like,” notes LaRue. “But they never prepared us for the final product, which tops those images in terms of quality and aesthetics.”

Just weeks away from occupancy, LaRue, who has been living, breathing and dreaming about this project for four years, is ecstatic. The facility appears to have achieved the impossible, meeting financial targets, wowing athletes, impressing design peers and the community at large.

“I almost have to pinch myself to believe it is real,” she notes. “To have the Oval come in on budget and on schedule, and then to have it exceed your expectations is like a triple header – What more could you ask for?”

Perhaps a gold medal or two for Canada during the Games, she adds.

*BTY Group is one of Canada's most successful and experienced Cost Management and Project Management consultancies. For info [www.bty.com](http://www.bty.com).*

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### **Integrated design elements**

The integrated design process values and combines unique ideas from designers, trades, engineers and architects to maximize and streamline a project’s potential.

At the Speed Skating Oval in Vancouver, all members of the consultant team, VANOC representatives and Richmond’s key management and facilities staff set goals while identifying building systems synergies to optimize energy use, environmental health and aesthetic values, supporting a triple-bottom-line definition of sustainability.

The value of the integrated design process is evident throughout the project.

For example, the glue lam beams for the building’s arches are truly integrated in terms of design, systems, engineering and contracting. The structures which are aesthetically beautiful and a key structural component, also house the mechanical systems within them.

This integration required that all contractors: structural, sheet metal and glue lam worked together in their shop process.

Similarly, the innovative sustainable source WoodWave panels on the roof involved the architects and engineers coming up with a unique design while the contractors, from

sprinkler and lighting consultants to builder working together to create a panel that was crafted virtually complete and eventually hoisted into place.