

Richmond Olympic Speed Skating Oval

Richmond, British Columbia, Canada



Creating the world's best long-track speed-skating rink required engineers to devise special systems to create a super-flat slab inside a structure resting on more than 700 feet of soft, compressible soil. To achieve this goal, designers used a reinforced concrete structural system and foundation to create an Olympic-grade athletic complex that is LEED Silver certified. Some 6850 tons of black and epoxy-coated reinforcing bar were used in the concrete components.

The challenges of the project were daunting. Nearby project sites were known to settle as much as 8 inches, yet the Richmond Speed Skating Oval could not vary from level any more than 0.6 inch over its full length — a distance of 4½ times the length of a football field. The project also included space for 450 cars, athletic services, retail and a rowing-training facility at no significant additional cost.

A two-level structure was devised to provide parking on the lowest level and the Oval on the upper level. Designed on a combination raft and pile foundation in densified soil, the two-level structure anchored buttresses that support the arch roof. The raft foundation is located in the infill areas between buttresses and has the dual purpose of supporting the suspended ice slab above and serving as the parking-slab surface at grade. The raft foundation system features epoxy-coated steel reinforcing bar to reduce potential corrosion caused by salt penetration brought into the structure by cars.

Pile caps located on the building's north and south sides support decorative buttresses and in turn are supported on 460 reinforced concrete expanded base (Franki) piles.

The concrete composition allowed the visually exposed buttresses to create dramatic focal points on each end. Epoxy-coated reinforcing bar was used in these buttresses and columns to ensure an excellent appearance over their lifetime.

Team

Owner:

City of Richmond, British Columbia, Canada

Architect:

Cannon Design, Vancouver, BC, Canada

Structural Engineer:

Glotman Simpson Consulting Engineers, Vancouver, BC, Canada

General Contractor:

Dominion Fairmile Construction Ltd. Vancouver, BC, Canada

Design Criteria:

- Design the world's flattest Olympic-quality speed-skating oval.
- Avoid any differential settling to maintain competition flatness specification.
- Create a first-floor parking deck to provide space for 450 cars and athletic facilities.

Total Project Cost: \$178 million

Total Size: 355,209 sq ft

Award:

2010 CRSI Design Award Winner—
Cultural & Entertainment Facilities Category

Photography:

Art & Architecture Photography



Epoxy-Coated Reinforcing Steel

COST-EFFECTIVE CORROSION PROTECTION

A Better Product Using More Than 40 Years of Improved Manufacturing and Coating Technologies.