

NORTH SURREY SPORT & ICE COMPLEX

LOCATION

Surrey, BC

SIZE

10,219 m²

COMPLETION

2019

ARCHITECT

Francl Architecture

STRUCTURAL ENGINEER

Bogdonov Pao Associates Ltd. (base)
StructureCraft Builders Inc.
(roof structure)

DESIGN-BUILDER

Lark Projects Ltd

WOOD FABRICATOR

StructureCraft Builders Inc.

PROJECT OWNER

City of Surrey

PROJECT OVERVIEW

When the City of Surrey decided to build a new sports and ice complex, the original design for the \$52 million facility, which houses three sheets of ice and community meeting spaces, included a hybrid timber and steel truss system with an acoustic metal roof deck.

The design-build team saw an opportunity to add value by using wood, so they replaced the metal roof deck with a prefabricated wood deck that not only saved money but could be installed more quickly. The wood roof deck also provided a warmer finish to the interior of the complex.

The wood fabricator also optimized the geometry and sizing of the long-span truss design to reduce truss weight, providing additional savings in materials and fabrication labour. This also

saved costs in lifting the members into place since the lighter weight trusses required a smaller crane. The optimized truss design was easy to install and simple to connect on site while still retaining the original architectural aesthetic.

The change to the wood roof deck and the optimized truss design resulted in savings of 30 to 40 percent for the roof structure and gave the City a faster construction schedule. Installation of the roof structure took less than three months.

The wood roof structure and deck also met the City's sustainability and aesthetic goals and fulfilled their commitment to use wood as a building material whenever practical and appropriate to construct City-funded capital projects.



Photo courtesy of Kyle Weiher, Lark Group

“It was important to for us to build an iconic building that the City of Surrey would be proud of. Most arena buildings are built with steel or concrete which look and feel cold, but this project, with its wood roof deck and structural glulam trusses, gives visitors a warmer experience. We were trying to make this more than just an ice arena, and with the switch from a metal to a wood roof deck, we got a better building.”

Scott Groves, Manager, Civic Facilities, City of Surrey

WOOD USE

The wood roof structure, left exposed to the space below, gives visitors to this large sports facility a uniquely warm experience. Hybrid timber and steel trusses, 43 metres long, form the main roof supports. The king-post trusses were fabricated with a double glue-laminated timber (glulam) top chord, steel rod tension chord and steel web members.

Engineers optimized the truss configuration using parametric software. By considering roof curvature, spacing of the king posts, depth of the trusses, truss spacing and other variables, they were able to reduce the size of the top chord glulam members while still meeting performance requirements. Doing so reduced the overall weight of the trusses and lowered installation costs.

For ease of shipping, the truss fabricator assembled half trusses, each about 21 metres long. They were trucked to the jobsite, lifted

into place and connected in the center with custom steel connections, engineered to meet relevant loading requirements. The trusses are supported at each end on concrete shear walls and in some cases, steel columns.

Prefabricated wood decking panels were formed using glulam purlins topped by plywood sheathing. The panels, which ranged from 3 to 4 metres wide and 11 to 16 metres long, were easily lifted into place to rest on the tops of the truss’s glulam top chords. Because the deck panels were pre-assembled, it was a straight-forward, streamlined installation process.

They team also installed a 4-metre-wide band of acoustic treatment on the walls of all three rinks. Doing so allowed for sound management in the active space while leaving the wood roof exposed, giving the complex a warm interior finish.



Photo courtesy of Kyle Weiher, Lark Group

FOR MORE INFORMATION

This profile is published by Forestry Innovation Investment, the Government of British Columbia’s market development agency for forest products.

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