

Uniting A City

Port Coquitlam's largest infrastructure project is set to open in March. BY CHERYL MAH



Pushing a nearly 5,000 metric ton steel superstructure across a span of 580 metres and over railway tracks is no easy feat. But that is exactly what had to be done for Port Coquitlam's new Coast Meridian Overpass.

Currently under construction, the \$135 million project is a 580m long, six span cable stay bridge with four vehicle lanes, two bicycle lanes and one pedestrian. The bridge structure is comprised of twin steel box girders with a composite concrete deck. When completed, it will serve as a critical new transportation link between north and south Port Coquitlam. It is also the city's largest infrastructure project to date.

The bridge required an innovative design and a lot of co-ordination with the different parties, says Mike Christian, quality manager, SNC-Lavalin Constructors Pacific (the design-build contractor).

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"The main challenge was just the nature of constructing, erecting and launching a bridge of that size," he adds.

Despite engineering and construction challenges, the design-build project is on budget and on schedule. Construction began in March 2008 and completion is set for February 8, 2010 (10 days ahead of schedule). The official opening is scheduled for March 6.

"The city has been planning this corridor for over 20 years," says Christian. "The biggest obstacle for the bridge has been just the ability to

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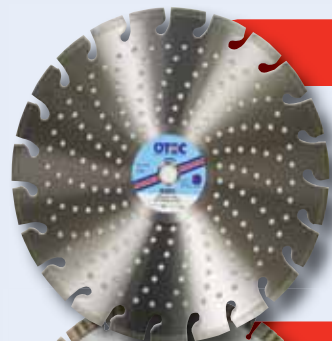
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The bridge crosses more than 50 parallel sets of tracks in the CPR rail yard.

construct it because of the limitations of the site. It crosses a large CP Rail yard. CP Rail has very strict regulations.”

The bridge crosses more than 50 parallel sets of tracks in the CPR rail yard, which bisect the city. Because of the rail yard density and congestion, the location available to place piers was limited and so long spans were needed.

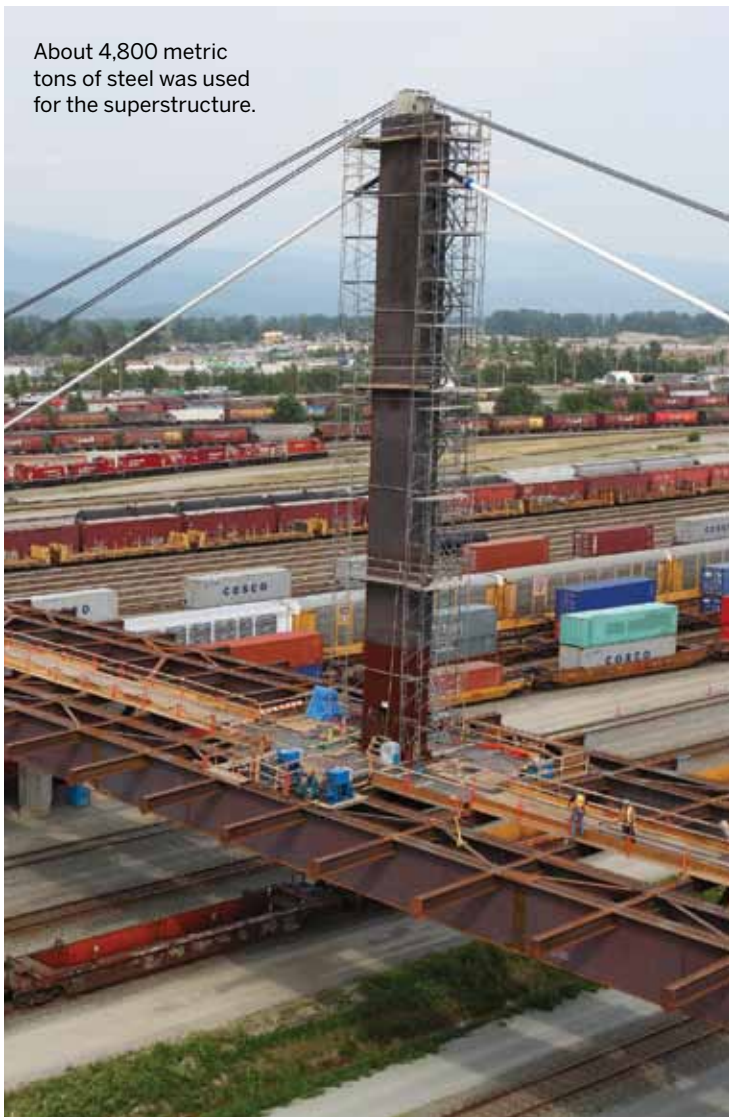
“We could not impact the operations of the CPR yard,” says Christian about the difficult site. “Pier access was very limited so we had no ability to erect bridge segments or any steel structures in between the piers. Conventional build would’ve been extremely difficult.”

The bridge is the first “incrementally launched” cable-stayed steel bridge in North America, and has the longest single span launched — 125 metres between piers 2 and 3. Five of the spans were launched due to constraints with the profile of the bridge. The sixth span over the Lougheed Highway was conventionally erected with a crane.

The five portions of the bridge deck, each the size of a Canadian football field, were pushed into place onto concrete support piers across the rail yard.

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About 4,800 metric tons of steel was used for the superstructure.



“We have a launching system that we developed and used on the Kicking Horse Bridge project. We modified it for the Coast Meridian,” says KWH senior engineer Robert Gale. “It basically clamps onto the bridge and moves it in 1.5 metre increments and then resets itself as many times as you need it to incrementally launch the bridge.”

The structure was launched in five different sections (and times) as the bridge got added to, each section being longer than its predecessor. The launch started from the south embankment and took four months to complete. This innovative construction method successfully overcame the many constraints holding back this key north-south route in the city, notes Christian.

The superstructure was fabricated by George Third & Son and Dynamic Structures, and was then erected by KWH Constructors (a division of GTS). A total of about 4,800 metric tons of steel was used for the superstructure and about 400 metric tons for the four 25 metre tall pylons. The project required more than 300,000 man hours to construct.

“Not only was it a very big and heavy structure to push, it was also a challenge to keep it actually on line,” says Gale. “We had to keep the structure to very tight tolerance longitudinally on line.”

The launching process was stabilized with the aid of cable stays attached to towers. The overpass is also believed to be the first use of temporary stay-cable systems for launching.

“We used temporary cable stays on the cantilever section of the launch in order to keep the tip of the nose from deflecting down too far,” explains Gale.

He adds this was one of KWH’s more complex projects. “This is about as complex as it gets for launching due to the fact of the span distance that we had to go plus the constraints we had with the site.”

The result is an iconic structure for Port Coquitlam which will address growth demands, reduce congestion on Loughheed Highway and deliver a long awaited solution to a transportation bottleneck that once divided a city in two. **CB**

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