



Project Update



Construction Status

(as of November 1, 2010)

Phase 1

- Construction of piers complete

Phase 2

- Audit of phase 1 work under review
- North and South temporary work bridges complete
- Temporary pier bents installed to permit launch of superstructure
- Fabrication of steel and cables for superstructure underway
- Delivery of first steel components has begun

Overview

The Deh Cho Bridge is the first fixed crossing to span the Mackenzie River, Canada's longest waterway. When the bridge opens to traffic in November 2011, it will be more than a kilometre long. The bridge will replace a ferry service and ice crossing at the same location.

The Deh Cho Bridge is intended to benefit the residents of the NWT by providing reliable all-season access to the increasingly important North Slave Region of the territory. It is expected that a more reliable crossing will reduce inventory costs, facilitate more timely ordering of goods, and encourage competition in the trucking industry, increasing efficiencies and reducing costs for all residents.

The Bridge significantly reduces environmental and safety risks associated with crossing the Mackenzie River. The consumption of half a million litres of oil needed to power the ferry will be totally eliminated. Idling vehicles will no longer have to wait to cross the river. The risk of fuel spills from vehicles crossing the river will be almost non-existent.

This newsletter is intended to update NWT residents on our progress as we complete construction of this important infrastructure project. In this issue, you will meet key members of the team responsible for the project, and will learn about the steps being taken to ensure the Deh Cho Bridge is constructed to the highest standards of quality and safety.

To learn more about the Deh Cho Bridge project, we invite you to visit our website at www.dehchobridge.info.



How does the Deh Cho Bridge deal with the river break up?

The cross section of the piers at water level is cylindrical in shape and the faces of the cylinder are sloped inwards, forcing ice to break apart as it rides up the slope. The concrete piers have steel armoured plating to protect them during river break up.

Where do the pieces of the Deh Cho Bridge come from:

- Fabrication of Towers – Armstrong, B.C.
- Fabrication of Trusses – Quebec City, QC
- Concrete Deck Panels – Armstrong, B.C.
- Cables – United Kingdom
- Concrete for Abutments and Piers – Fort Providence, NWT

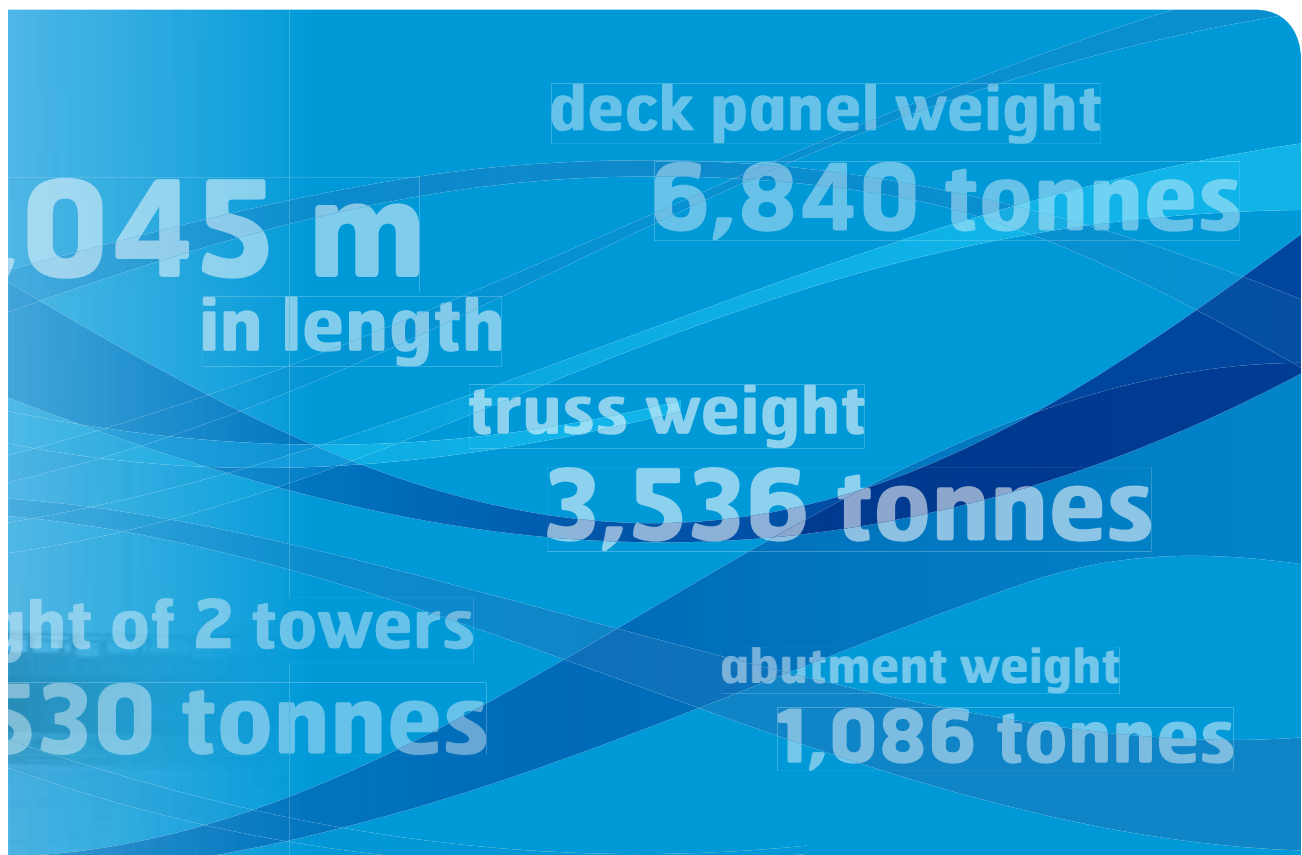
Levelton brings top quality

Seeing the biggest infrastructure project in the world, it's built to the highest standards of quality is so

Neil is the Executive Vice-President of Levelton Consultants Ltd, a B.C. based firm hired by the GNWT to assure the government and taxpayers the \$182 million Deh Cho Bridge is built to the contract specifications and Canadian Bridge Code standards. He says his company's focus on the project is around Quality Assurance.

Quality Control is the system Ruskin Construction, the general contractor on the project, and its sub-contractors put in place to monitor their own work to ensure it meets specifications, Neil explains. "Quality Assurance is really what we need to do to provide assurance to the owners that the contractors' Quality Control process is working and effective, and what they are buying complies with the requirements of the contract."

While seeing that the Deh Cho Bridge is completed to project specifications, Levelton has also been asked to complete an audit on the first phase of the project, which includes the eight piers currently in the water. According to Project Director Kevin McLeod, the purpose of the audit is to determine whether the work has been completed in accordance with design



Quality assurance to Deh Cho Bridge project

History of the Northwest Territories through to its finish is a daunting task – and making sure something in which Neil Cumming is excited to take part.

specifications. Any issues that need to be addressed are identified to ensure the project is safe and will meet its design life.

Neil said it's not uncommon for problems to arise during a project of such magnitude. It's the role of Levelton to make sure all documentation made through the Quality Control process is reviewed, and any quality issues where contract requirements are not met are dealt with.

"We provide commentary and we check for compliance with specifications," Neil said, adding they conduct audits on-site and at the plants across North America where materials for the bridge are being produced. "We interview the people and we have a look at the work product to make sure it's in compliance with the contractors' own quality control plans. (We ensure) that the deficiencies are being properly tracked and closed out and the documentation is complete."

Non-conformance reports identify the root cause of any problems and propose some form of remedial action. "That action, once it's approved, it's implemented by the contractor. Once it's completed

satisfactorily, it's closed out and signed off," Neil said.

Part of the non-conformance report process is to identify and correct the deficiency. The other part is to identify why it happened so that it doesn't happen again.

Neil said Quality Assurance is about more than just completed paperwork. "We try to encourage the right mentality, encourage people to have pride in the work they want and at the end of the day to produce a product they are proud to deliver that does comply and is a quality product," he said.

Neil likes to think that Levelton runs a tight ship when it comes to Quality Assurance, and its 40 years of experience in projects like the Deh Cho Bridge shows it. With over 15 years of work with the Vancouver Airport Authority, its recent involvement in the Sea to Sky highway in Vancouver and the company's current involvement with the BC Place roof expansion, Levelton brings dedication and high-quality standards of business to the Deh Cho Bridge project. Says Neil, "In terms of reducing the maintenance burden and extending the life of these major structures, Quality Assurance is a major part of the process."

Newer, sleeker bridge design a big step forward for project

Once the Deh Cho Bridge is complete, the Northwest Territories will be home to North America's longest seamless bridge.

After a review was done on the original bridge design, Vancouver-based Infinity Engineering Group Ltd. was asked to offer solutions to ensure the structure met Bridge Code standards.

Singh said the design team had to come up with an innovative way to deal with temperature movements. "A bridge expands and contracts with temperature changes, because it can get quite cold and also quite warm," Singh said. "The longer your bridge is, the longer the movements are. I had to come up with away to deal with these temperature movements." Part of the solution was the installation of Lock Up Devices (LUDs).

LUDs are most commonly used in seismic regions of the world where bridges might be subjected to earthquakes, Singh said. "They allow the bridge to expand and contract freely," he said, adding if the bridge begins to move in a certain direction because of, for example, a windstorm, the LUDs will allow the force of the movement to be supported by the entire bridge

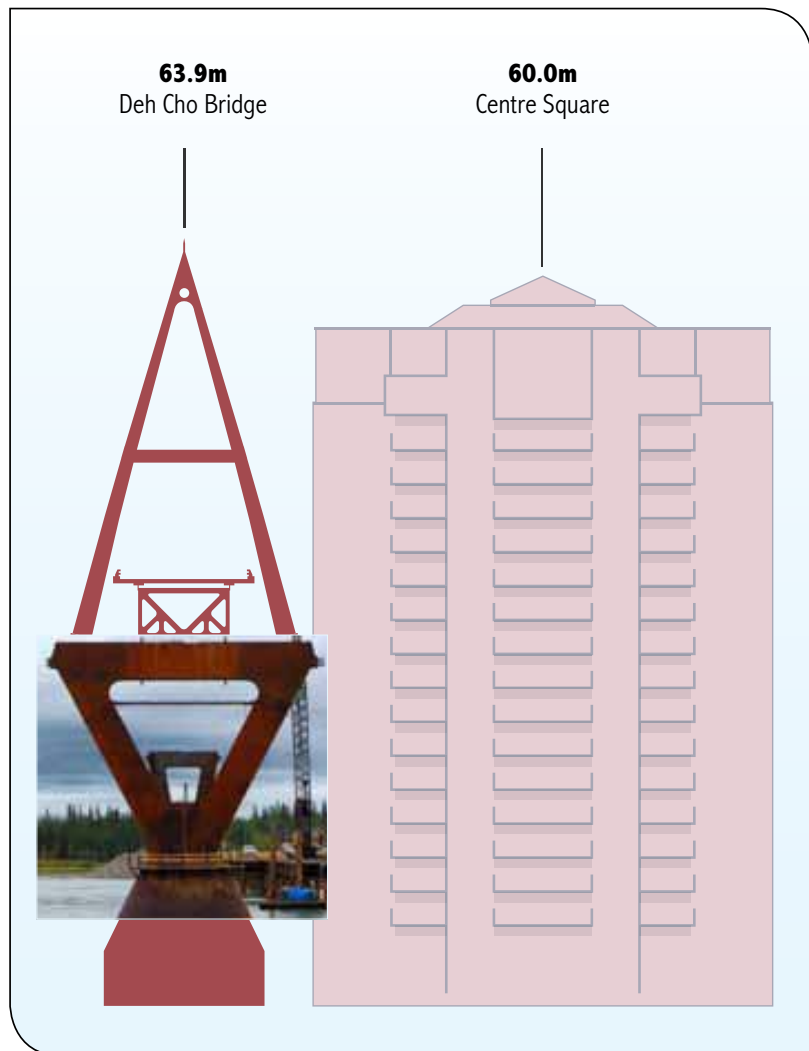
and not just one of the main piers. Singh said that by building a seamless deck, they were able to eliminate two expansion joints in the main span of the bridge, recouping the costs of the LUDs.

According to Prabhjeet Raj Singh, Infinity's Vice-President, joints are where water gets in, exposing the steel and increasing maintenance costs. "At some point these joints have to be replaced because they don't last the life of the bridge", he said. "It all translates into long-term savings for the GNWT."

The weight of the deck has also been cut down in the new design by 30 per cent. This was accomplished by supporting the deck in four places – on the two trusses, where the original design had all the support, as well as on the floor beams. Singh said they were able to reduce the amount of steel used in the trusses by 20 per cent.

The designers also chose a high-tech locked coil cable system, most commonly used in Europe, which he said "was the best system because of the low temperatures. They're easier to inspect and they're very durable. It's a good long-term component."

The redesigned bridge meets all Bridge Code standards, and it promises to have lower annual operating costs overall. The result is a bridge that is both attractive and functional, with a design life of a minimum 75 years.



Profiles



Infinity Engineering Group Ltd.

Dr. Matthias Schueller, Ph.D., P.Eng, Engineer of Record, Design

Dr. Matthias Schueller has been involved in numerous bridge projects across Canada and Europe, including the rehabilitation of the Angus L. MacDonald Bridge in Halifax N.S, the Athabasca Bridge Project in Fort McMurray, AB and the Golden Ears Bridge Project in Langley B.C.

Dr. Schueller brings a strong sense of expertise and dedication to his work while faced with difficult challenges. “The greatest challenge was the extraordinarily tight schedule which allowed only six month for the redesign of the superstructure,” he said. “This was achieved by executing design tasks simultaneously whenever possible.” Clarification of design criteria, computer modeling, erection engineering, design and detailing, quality control, checking and verification were discussed in weekly team meetings and controlled by internal and external audits.



Levelton Consultants Ltd.

Neil Cumming, P.Eng, Executive Vice-President

For 33 years Neil Cumming has brought a high level of professionalism and dedication to quality to Levelton Consultants.

Cummings’ technical specialty is in the field of construction materials technology and “specifically in quality assurance and durability of structures.”

Cumming said Levelton brings a lot to the Deh Cho Bridge project in terms of expertise, but he said the most important thing he brings to the project is a sense of team.

“It’s truly a team effort between the owners, the advisors, the general contractors, the designers, the suppliers and sub-trades, and that’s the kind of culture I like to bring to a project,” he said.



Associated Engineering

Leslie Mihalik, P.Eng, Manager, Northern Infrastructure

Leslie Mihalik’s responsibilities with the Deh Cho Bridge Project is best described as the cog of a wheel. As the Project Manager working under strict timelines, Leslie’s role is to “make sure the contractor and everyone has the right information to build the bridge,” he said.

“We also manage the budget. We assist the government to make sure the money is spent properly.”

Mihalik said while the project is a challenge, he understands the importance of strong working relationships and communication to the success of the project.





GNWT Department of Transportation

Kevin McLeod, P.Eng, Director of Highways and Marine, Project Director

Kevin McLeod has a lot on his plate when it comes to his position as Director of Highways and Marine with the GNWT.

“I’m responsible for surface transportation network in the NWT – all the highways, access roads, and bridges,” he said.

In the job since 2004, McLeod emphasized the importance of the team effort when it comes to the future completion of the Deh Cho Bridge Project. He sees his role as the representative of the interests of the owner, the people of the NWT.

“It’s a large team effort, from the designer through to the youngest welder on the project, they all have to have a common sense of putting this project together,” he said. “I set the environment so the folks that have a job to do can do it successfully.”



Ruskin Construction Ltd.

Andrew Purdey, CEO & Chairman

Starting in 1989 with only a few workers on staff, Ruskin Construction has grown exponentially in the past 21 years says Andrew Purdey, founder of the company.

“We were a couple guys building forestry bridges,” he said. “We’ve become a national and international player in specialty foundations and structures, servicing public and private interests.”

Purdey says they have found themselves in the North almost every year since the early 1990s when they built their first bridge over the Yellowknife River.

“We’re very experienced in working in northern climates and we’ve got a strong logistical support team to support these projects,” he said.



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