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## THE NORTHERN & REMOTE COMMUNITIES ISSUE







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# EMERGENCY ACCESS

FORMULA CONTRACTORS STEPPED IN TO CONSTRUCT AN EMERGENCY BRIDGE

WHEN A RAINSTORM WASHED OUT AN IMPORTANT THOROUGHFARE

By Heather Hudson

**W**hen Mother Nature rages, Formula Contractors gets to work.

British Columbia's Ministry of Transportation called on the Prince George, B.C.-based company, which specializes in innovative construction solutions for bridges, structures, foundations, civil construction, rental bridges and more, to restore access to a road after a massive weather event.

It was their expertise in bridge construction that landed them the recent emergency job building a temporary bridge on pile foundations in British Columbia's Peace Region in June. An early summer rainstorm caused flooding, completely washing out twin culverts on Rolla Road, a well-travelled thoroughfare connecting two main highways.

"We do a lot of emergency work due to Mother Nature," said Phil Toma, senior project manager and partner at Formula Contractors.

"This particular bridge was important to get at quickly," he said. "[In Dawson Creek], when access to one of the few highways is down, it wreaks havoc on that part of the province, cutting off the lifeblood in other directions."

Rolla Road connects travelers from Hwy. 49 on the north side and Hwy. 2 on the south side. Its importance led B.C.'s Ministry of Transportation to engage Formula Contractors to install a temporary bridge solution as quickly as possible.

In a mere 24 days, they got it done.



PHOTOS COURTESY OF FORMULA CONTRACTORS





**“This was not a cookie cutter part of the project. We needed to put a lot of engineering and logistics into place to ensure [girders] got there safely.”**

**– Phil Toma, Formula Contractors**

### The damage

A two-day rain event flooded two culverts (60m long and 3.5m in diameter) on Rolla Road near Dawson Creek, B.C., making the road impassable. The Peace Region is known for its silty, porous soils thick with clay, which slip, slide and create geo-technical challenges.

“It’s just slop, especially when it rains,” said Toma.

With time of the essence, the ministry reached out to Formula to get started as soon as possible. The company has done a significant amount of highway work, both directly and as subcontractors, and their sterling reputation preceded them.

### The solution

The fastest way to get it done efficiently was to build a temporary detour structure off the road while Formula put in a double-lane, 36.5-metre long steel girder bridge on pile foundations.

“We assisted in designing a foundation solution for them using six 762-mm diameter piles, three per end,” said Toma.

Designing and installing a permanent structure would require significant government funding (upwards of \$1.5 million) and include a bidding, approval and design process, which could take years before the bridge was complete. Due to the urgent nature of the project, Formula was asked to design and install a “long-term” temporary solution with a budget of \$1.5 million.

With temporary in mind, the bridge structure deck is non-composite, comprised of pre-cast deck panels that are fastened to the girders.

“We used a fabricated steel abutment cap on the pile foundation,” said Toma. “When the time comes to disassemble this structure, the pre-cast deck panels can be taken off, the bridge girders unbolted and the piles can be either vibrated back out or cut off at the ground line.”

### Installing the bridge

The installation of the bridge is as straightforward as the piling, but required a delicate touch given the soil local conditions. The girders were cantilevered over the north abutment cap, pushed out and grabbed by a 110-ton crane on the south side and placed on the south abutment cap. The deck panels were then placed on top of the girders and bolted in.

### Project challenges

While the piling aspect of the project was straightforward, it was challenging to achieve the end bearing required for weight loading for the structure.

“We had to use a 10,000-pound drop hammer to get the piles deep enough for the required engineered loading – bearing and fixity,” said Toma.

A bigger challenge was transporting the 36.5-metre girders from Chetwynd, B.C. to Dawson, about an hour’s drive. Due to their length, the three bridge girders and associated bracing had to be transported to the Rolla Road site through Dawson Creek using a transport truck and rear steering dolly configuration.

Dawson Creek has a roundabout, which made moving the oversized load a challenge.

“This was not a cookie cutter part of the project,” said Toma. “We needed to put a lot of engineering and logistics into place to ensure it got there safely.”

Skilled labour could have presented a challenge on this tricky project that required “the right guys with the right mindset to make this job happen efficiently and safely,” said Toma. “To launch a bridge is not an everyday thing.”

Fortunately, Formula was able to engage experienced crane operators, bridgemen and perhaps most importantly, a professional engineer who is able to create a proper design. Their on-staff engineer just happens to have worked with the ministry in the past, so brings a wealth of expertise to jobs just like this.

In all, they had five workers on the job site, plus ministry representatives, a project manager and an engineer.

“Overall, standing there on the job site when things are smoking along busy, we probably had at least 15 people,” said Toma.

### Equipment

Two 110-ton Terex HC110 crawler cranes were used to get the girders in place.

“For pile driving, we had a 32-inch set of leads with a 10,000-pound drop hammer,” said Toma.

Formula owns the equipment and supplied the 762-mm diameter pipe piling out of Vancouver.

“We drove six locations, which went into the ground 32 metres each before they hit the refusal criteria in the design,” he said.

The emergency bridge restored regular traffic flow throughout the Peace Region, making life easier for people and businesses alike.

Formula is working on a number of pre-planned projects in the province, but Toma says they’re on alert for when Mother Nature strikes again. 🍁