

Textbook Crossing For Canada

by D. Monte Bachand and Bernard P. Krzys

A phenomenal project was recently completed in western Canada. In fact, it became one of the longest river crossings ever made in the world and the largest directional drilling contract awarded to a single contractor in Canada.

The Crossing Company Inc. of Edmonton, Alberta, completed the project started by Kamloops Augering Ltd. of Kamloops, British Columbia. Federated Pipeline, headquartered in Calgary, Alberta, called for bids in June 1997 for two crossings under the Peace River—one at Taylor, British Columbia, and the other near Dunvegan, Alberta. Kamloops was the successful bidder but when The Crossing Company purchased Kamloops' HDD assets last November, it inherited the Peace River project.

The project was the Northern Expansion Project oil product pipeline. It included 8, 10 and 12-in. (200, 250 and 300-mm) pipe and had a total length of 277 miles (447 km). The first crossing was completed by Kamloops on the Dunvegan to Judy Creek leg of the pipeline. That crossing was significant for its 4,864-ft (1,473-m) length requiring a pullback of three 8-in. (200-mm) steel lines in one bundle.

The more difficult of the two crossings was the Peace River crossing at Taylor on the Taylor to Belloy pipeline section. On the entry and exit sides, surface gravel required installation of surface casing. On the entry side, 182 ft (55 m) of 24-in. (600-mm) casing was installed at 18 degrees and 12-in. (300-mm) casing was inserted into the 24-in. (600-mm) casing down into bedrock to stabilize the drill string. A TT Technologies Taurus rammer was used to install the surface casing. Once the surface casing was installed, the gravel was augered out, leaving the casing clean and ready for drilling.

Five-inch (127-mm) grade G pipe was used for the drilling along with a Vector mud motor and drilling fluids from Baroid Industrial Drilling Products.

On the exit side, drillers again had to use surface casing to control the gravel. At the surface, the gravel extended to 130 ft (39 m) in depth and had to be installed by the open-cut method. Through the surface casing, the hole was backreamed to 18 in. (450 mm) in diameter and a 10-in. (250-mm) product line was pulled back into the reamed bore.

The drill rig used was a Contractors Manufacturing Services 500,000-lb (2,225 kN) unit. Loren Trueman was the project superintendent and Jess Briscoe was the project manager. They decided to name the CMS rig "The Peace Maker" in honor of the crossing.

While the project was initially two crossings, 18 crossings were later added, bringing the total to 20. These added crossings ranged in length from 825 to 2,475 ft (250 to 750 m) and the geology consisted of clay, gravel and shale rock.

Six of the crossings were completed by Kamloops and 14 by The Crossing Company. This was the largest single HDD contract awarded in Canada and included the longest crossing on record ever completed in Canada.

Work started last September and was completed at the end of February. The weather conditions were horribly cold, especially in January when, for a period of three weeks, temperatures dipped to -43F (-42C). High-pressure steam boilers were used on the rig to keep it warm and to keep components from freezing. Much of the equipment and site had to be enclosed.



A 180-ft (55-m) surface casing is extracted on the entry side.



Casing installed on the exit side aided in the recovery of the drill bit and casing off of the gravels.

Sharewell Inc. of Houston, Texas, provided the guidance for both Peace River drills and Sharewell and Radius Canada shared the balance of the 18 crossings. The deepest point of the river crossing was 250 ft (75 m) below the river bottom.

Ken Merchie was the engineer for the Northern Expansion Project for Federated Pipeline and Ken Colvin, president of Cimarron Engineering in Calgary, managed and engineered the pipeline. J.R. (John) Jameson with Entec Consulting Ltd. in Calgary provided the design and technical engineering for the river crossing. Geo Engineering in Calgary provided the river crossing geotechnical information.

Jameson said that to the best of his knowledge, this 5,660 ft. (1,725 m) crossing of the Peace River is one of the top 10 crossings in the world.

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