

Four Bears Bridge

New Town, ND



The Four Bears Bridge, near New Town, North Dakota, serves as a critical link for the communities of the Fort Berthold Indian Reservation. The location of the project presented a significant issue. The bridge is being built outside a town of 1,500 people and this is the largest town for 70 miles.

Construction on the new Four Bears Bridge started in April 2003. The new bridge design includes two abutments, 14 piers placed 316' apart, 454 9.5-ft. typical segments in the spans between the piers, 28 5.5-foot pier segments on top of the 14 pier columns, and 15 2-foot closure joints at the mid-point of each span between piers. Pier segments weigh about 98 tons each, and include 47 cu. yds. of concrete and 12,338 lbs. of epoxy-coated epoxy-coated reinforcing steel (ECR rebar). The typical segments weigh about 70 tons each, and include 35 cu. yds. of concrete and 5,500 lbs. of epoxy-coated reinforcing steel (ECR rebar).

The main challenge to this project was climate, with the lake freezing during construction. A comprehensive ice report determined that an ice criterion of 36" ice thickness, with a crushing strength of 200 psi would most likely impose the maximum loading on the circular columns. The piers are protected against ice using cone-shaped concrete piers 39' in diameter. The side walls of the cones are set at 65°, which will deflect ice upwards, reducing the stress on the piers. The piers are each supported by 13 or 14 pilings driving into the riverbed between 90' and 160'. The piers range from 45' to 73', and the bridge ranges in thickness from 8' to 17', placing the roadway as high as 90' above the water.

The Four Bears Bridge are named after two Indian chiefs, both of whom are named Chief Four Bears. One is from the Mandan Tribe, the other from the Hidatsa Tribe. The bridge is decorated with a series of 10-foot diameter medallions that represent the heritage of the three tribes that live on the reservation (Arikara, Hidatsa, and Mandan).

Team

Owner:

North Dakota Department of Transportation

Designer:

Figg Engineering Group

General Contractor:

Fru- Con Construction (Bilfinger Berger Civil, Inc.)

Design Criteria:

- Provide context-sensitive structure to provide access.
- Replace North Dakota only deep-water bridge.

Total Project Cost: \$155 million

Total Size:

LENGTH: 4483 ft

Epoxy-coated Reinforcing Steel:

1,300 tons

Photography:

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