skylinesteel

French in origin, a fitting Canadian Solution

cais·son (kā'sŏn', -sən) n. : From the old French, large box, alteration (influenced by caisse, chest) of casson

A) A watertight structure within which construction work is performed under water.

B) A large box open at the top and one side, designed to fit against the side of a ship.

C) A floating structure used to close off the entrance to a dock or canal lock.

D) A temporary structure solution to construct a bridge trestle.

E) All of the above.

Steel casing being delivered to site.

Caissons placed in rigid template frame.

Problem

The Ministry of Transport of Quebec needed to construct a new bridge in Gatineau, Quebec. The new bridge is located over environmentally sensitive wet lands and as such the general contractor was denied access onto the wet lands. The use of earth dyke for construction access was not feasible. Given these restrictions, the apparent option for access to construct the bridge piers was a temporary trestle.

Solution

In the winter of 2006 Petrifond Foundation Company Limited, a speciality foundation contractor was awarded a contract to install 3 large diameter caissons to support the entire Pier 3 bridge alignment for a length of 183m (600ft).

The caissons were designed with a permanent steel casing 3600mm diameter x 25mm wall thickness (12ft x 1in), produced out of the Skyline Steel rolled & welded facility in Newton, Illinois and supplied by Skyline Canada Ltd. The steel casing lengths were custom fabricated at our facility to accommodate the anticipated bedrock profile. The casings varied from 12m (40ft) to 20m (66ft) in length and weighing up to 45 tons. This material service was just another example of how Skyline partners with customers to provide the most value.

Result

Caissons were installed through the overburden and seated into the bedrock, with 9m rock sockets. The bedrock sloped 30 degrees along the transverse alignment of the pier footprint, making the caisson installation very challenging to achieve the stringent verticality tolerance of 1%. The caissons were then cleaned out and the bedrock sockets inspected. The inspection included a submersible camera placed underwater and the bedrock socket walls, and rock core samples were taken at the caisson bottom. The data collected was then analyzed by the Ministry of Transportation and upon approval the caisson was ready to be concreted. The caisson work was completed in 3 months without any project delays.

Project Details

Material:
45 tons of rolled & welded steel pipe - 3600mm diameter, 25mm wall thickness

Structural Consultants:
Genivar

General Contractor:
GTS-Loiselle Joint Venture

Foundation Contractor:
Petrifond Foundation Co. Ltd.