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Foundation specialist : piling, caissons, shoring, diaphragm walls, slurry wall, trenches, including design and excavation

PROJECT NAME : Hydro-Quebec – Anjou-Duvernay
Power Transmission Line



DESCRIPTION: Following the devastating ice storm of January 1998, Hydro-Quebec decided to reinforce its power transmission and power distribution network. One such project was the erection of an 8 km section of 315 kv transmission line extending from Anjou, Montreal to Duvernay, Laval. The new link provided quick back-up power in case of another major ice storm.

The transmission line was designed on modern monopoles, which provided aesthetics to the urban communities. However, the new towers had to be supported by large diameter caissons due to the inherent high overturning moments. The transmission line alignment passed through urban communities and crossed over the Rivière-des-Prairies, which was supported on 16 land and 3 marine caissons.



Land base caissons ranged between 2.6 m to 3.2 m diam. and drilled through 6 m to 20 m of overburden, consisting of soft clay underlain by very dense glacial till. The caisson sockets comprised of 6-610 mm diameter rock sockets extending 8 m below the caisson were installed at the base of the permanent steel liner that was sealed 1m into the limestone bedrock. Marine base caissons were 4.3 m diam, which were installed with a steel template off a barge. The steel liners were lowered through the template and pushed into the river bottom and then drilled and sealed into the bedrock. Eight 610 mm sockets were drilled around the inside of the liner using a rigid template frame similar to the one used on the land caissons. The bottoms of the

sockets extended 16 m below the water level.

CHALLENGE: The marine base caissons were complicated due to the highly weathered shale bedrock. This feature complicated the drilling of sockets when high losses of compressed air from the drilling tools were noticed. Drilling sockets got worse when the rock at the top of sockets collapsed, which was caused by weakening the rock mass due the high number of sockets drilled. Essentially a Swiss cheese effect was created which resulted in rock instability. This problem was resolved by drilling holes opposite to each other rather than adjacent. The weak rock occurrence resulted in the schedule falling behind and therefore a second barge with additional drilling equipment was mobilized. The weekly work schedules for both crews were extended to seven days from five and by doing so the Milestone date was met.



PROJECT VALUE: \$3,000,000.00 CDN

PROJECT PARTICIPANTS :

OWNER : Hydro-Quebec
ENGINEER : Hydro-Quebec
GENERAL CONTRACTOR : GLR

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