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**PROJECT :** Swan Creek River Bridge, New Brunswick

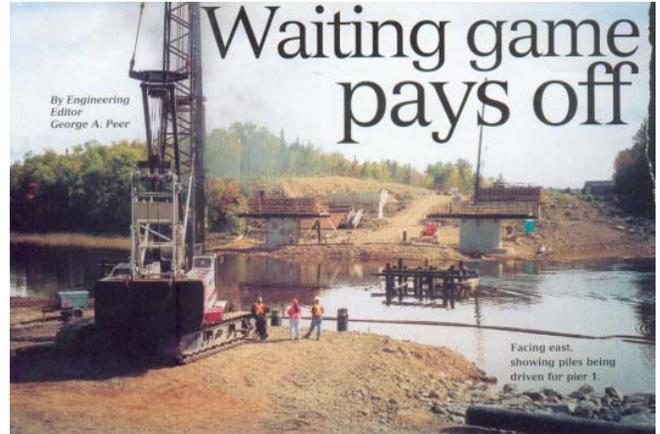
**DESCRIPTION:** Installation of 176 piles:

44 piles	HP 12 x 89	4036 ft.
28 sleeves	20" x 3/8"	2953 ft.
84 piles	20" x 1/2"	9633 ft.
28 sleeves	24 » x 3/8"	<u>2205 ft.</u>
		18,827 ft.

**SCHEDULE:** May through October 2001

## CHALLENGES:

An extended construction schedule was adopted because the body of water that the structure spans 15 km East of Oromocto, Swan Creek Lake, is underlain by soft clay, varying from 60 to 150 feet. The Swan Creek Lake bridge program spanned 23 calendar months, 12 months longer than if problem-free ground conditions had been encountered. Highway builder Marine Road Development Corporation (MRDC) adopted the slow-but-sure approach after the province's Department of Transportation and Thurber Engineering Ltd., Toronto, completed a geotechnical investigation and installing hundred of wicks drain allowing the soil to properly consolidate.



In December 1999, six months before the piling work started, MRDC awarded the civil work to Herve Pomerleau Inc., St-George Beauce, Quebec, who in turn subbed the piling work to Montreal-based Petrifond Foundation Co. Ltd.

More than 6000 m of piling went in for the three piers and West abutment. Piles for Pier No. 2 were installed using a sectional barge. All piles were installed using a LS

218 crane mounted with a 100'-VTL and a B-5505 hammer.

Because the piling was done late in the summer while the water was at its lowest level, gravel pads were pushed out from shore so everyone could work in the dry. Only Pier 2 had to be accessed from barges. But because of the shallow water, "it wasn't easy to move barges around; at times the barges were winched across through the sand bars.



Two types of piling were used. At Piers 2 and 3, concreted-filled pipe piles went in. At Pier 1 and at the West abutment, however, these piles would likely have failed because of the clay consolidating under the embankment.



Instead, a pile-within-a-pile system was adopted: a combination of H-piles and pipe piles. The pipe pile went around each H-pile so the friction load from the clay caused by the embankment settling would be taken up by the pipe sleeves rather than by the H-piles. This design detail is commonly used in the Maritimes when high down drag loads are expected.

The H-piles were driven a maximum of 45 m through the clay to refusal in hard till before the pipe piles went in. Because the high-capacity H-piles would be carrying 4000 kilonewton each, driving time per pile including refusal averaged almost four hours.

## PARTICIPANTS:

**OWNER AND CONSTRUCTION MANAGER:** MRDC

**ENGINEER:** Eastern Designers

**GENERAL CONTRACTOR:** H. Pomerleau Inc.

**SPECIALTY CONTRACTOR:** Petrifond Foundation Company Limited

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