

# The Canadian Engineer

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## BRIDGE CONSTRUCTION AT NEWCASTLE, N.B.

DESCRIPTION OF THE FOUNDATION WORK OF THE MIRAMICHI RIVER HIGHWAY BRIDGE—BUILT ON TWO ABUTMENTS AND FIVE PIERS OVER 1400 FOOT CHANNEL—OPEN CAISSON DREDGING METHOD USED

By C. A. WENTWORTH

**A**N interesting piece of bridge foundation work is being built for a highway bridge across the Miramichi River at Newcastle, N.B. Newcastle is situated about thirty miles from the mouth of

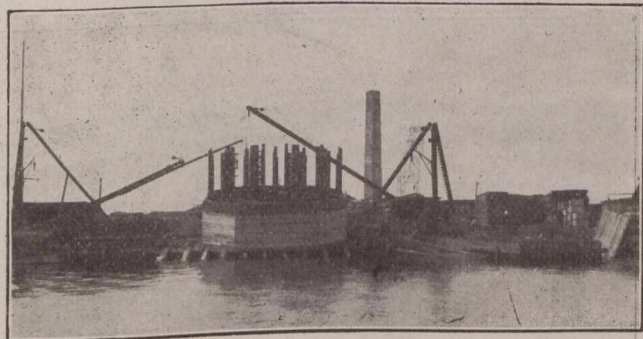


Fig. 1.—Pivot Pier Caisson Ready for Launching.

the river and is a growing town of 3,000 inhabitants. Across the river is the town of Nelson, and six miles below, on the Nelson side, is Chatham, whose population is slightly larger than that of Newcastle.

The river varies from three miles wide near the mouth to about one-half mile wide at Newcastle. The

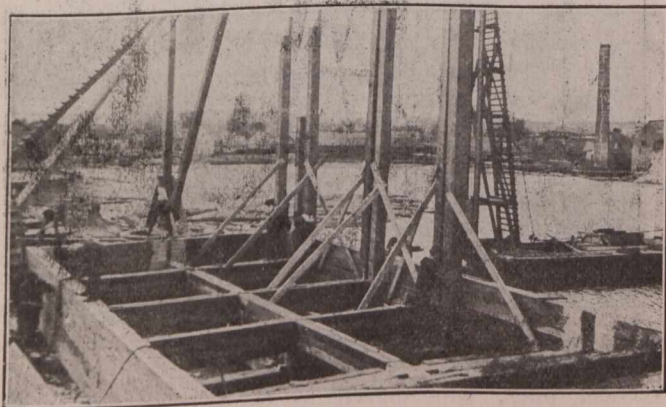


Fig. 2.—Lower Course and Binder Posts of Caisson No. 2.

nearest highway bridge to the mouth of the river is at Indiantown, over forty miles from the mouth and about fifteen miles from Newcastle.

Four to five months in the winter the river can be used as a highway, as the ice is usually 30 in. to 36 in. thick; and for a slightly longer time in the summer ferry boats cross the river at both Newcastle and Chatham, but for a month or more in the fall and spring there is no way of crossing. The important lumber and manufacturing interests all along the river made the construction of a bridge a necessity to accommodate the important interests of the people in this section of New Brunswick.

After careful examination by diamond drill borings, the location was decided upon opposite Newcastle, and about one mile downstream from the confluence of the southwest branch with the northwest branch of the Miramichi River.

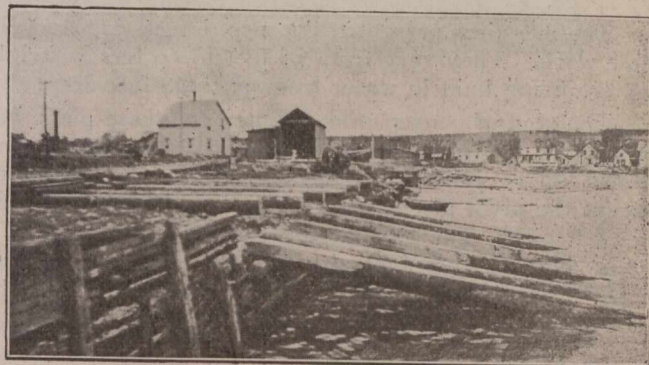


Fig. 3.—Launching Ways.

The water in this river is from thirty to forty-five feet or more in depth, and there is a tidal variation at Newcastle of about six feet, with a maximum of ten feet. The current varies with the tide from three miles per hour upstream on the flood tide to nearly six miles per hour downstream on the ebb tides.

The river bottom consists of fine sand and mud, twenty to thirty feet deep overlying harder strata of sand and clay, and sand and gravel, carrying artesian water. This bottom produced unusual foundation difficulties to contend with, there being no ledge rock on which to rest the piers, except at the Nelson abutment.

The design finally adopted for the bridge calls for four spans of 278 feet, and a draw span with an opening of 115 feet on either side of the draw. The approaches are each about 700 feet long and are composed of rock-