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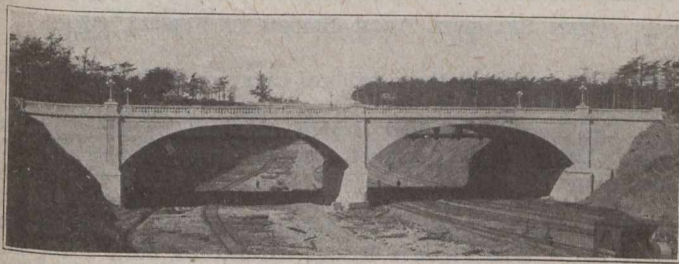
Canadian Reinforced Concrete Arch Bridges

Historical Review and Lists of Open Spandrel and Earth-Filled Arches With Clear Span of Over 100 Ft. or Total Bridge Length of Over 200 Ft.—Brief Review of Concrete Truss Bridges

By **FRANK BARBER**
Consulting Engineer, Toronto

IT was estimated by Edwin Thatcher that in 1904 there were only about one hundred concrete bridges in America. Now, after fifteen years, there are probably as many within a few miles of Toronto. Neither steel nor any other material ever revolutionized bridge building in such a short period.

In 1918 concrete bridges first exceeded steel bridges in the gross amount spent in any period. The "Engineering

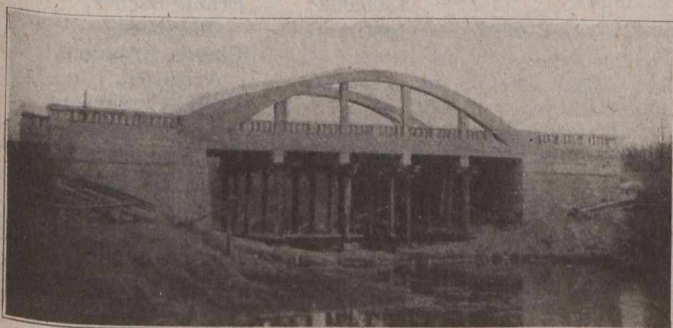


YOUNG AVE. BRIDGE, HALIFAX, N.S.
(Earth-Filled Arch Bridge)

News Record" estimate of cost of bridge building in the first nine months in 1918 in the United States was as follows: Concrete bridges, \$5,900,000; steel bridges, \$4,800,000.

After a period of comparative inaction in bridge building, due to the war, and before what will probably be a period of considerable activity, it seems a fitting time to review concrete bridge building in Canada. After extensive correspondence with bridge engineers throughout Canada, the lists on pages 290 and 291 have been compiled.

The open spandrel arches are the most important, as this is the type adopted for nearly all the longer arches on



CONCRETE TRUSS BRIDGE AT WILLOW CREEK, MAN.

account of the great weight of the filling in earth-filled arches of long span. The seven given in the list in the order of the span length are also, except for the last, in reverse chronological order.

The first long-span Canadian arch was earth-filled and was built at Massey, Ont., span 92 ft., in 1906 by W. A. McLean, Deputy Minister of Public Highways, Ontario, but then chief engineer of the department. Besides being a pioneer in this field, it may be noted incidentally that Mr. McLean probably deserves chief credit for introducing concrete sidewalks in the towns of Ontario. This is not so well known as his later connection with Ontario's highways. The Massey bridge was exceeded in span two years later, in 1908, when Jas. Bell built the Lynhurst bridge, St. Thomas, of clear span 116 ft., costing about \$11,000. In 1910 the palm for long-span arches passed to the first long Canadian open spandrel arch, the Wadsworth bridge at Weston, Ont., span 118 ft. 6 ins., built in 1910 by Barber & Young, at a cost of about \$15,000, and the record spans have since been of this type. Mr. Bell's bridge,



ARDEN ARCH NO. 3, MANITOBA
(Open Spandrel Arch with Floor Suspended Midway
Between Springings and Crown)

however, remained the longest earth-filled arch in Canada until a few months ago, when the Tower Road bridge, Halifax, was completed, of span 144 ft., by W. A. Duff, bridge engineer to the Canadian National Railways. This is a flat arch, requiring no great depth of earth fill; otherwise hollow spandrels would have been more economical. Even so, this arch is probably close to the economical limit for filled arches and may not be soon exceeded by this type.

Reverting to record spans, the Wadsworth bridge was exceeded by two bridges built in 1913. One of these was at Port Arthur, a single span bridge of 130 ft. span in the clear by L. M. Jones. In the same year was completed the King George arch at Oakville for the County of Halton. The county engineer was Jas. Hutcheon, and the bridge was designed and erected by the writer as consulting engineer. Besides the main arch of span 135 ft., there are eight concrete beam spans, making a length of bridge proper