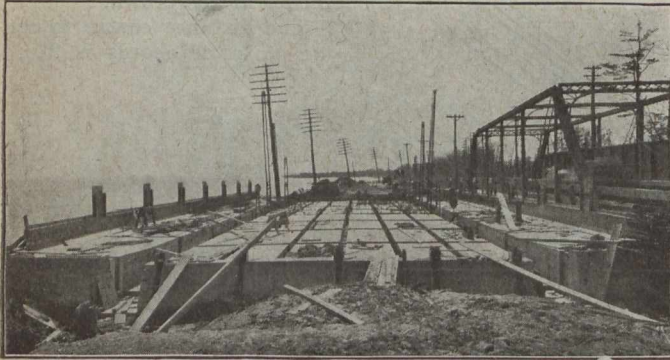


bridge is complete excepting the hand-rail, a retaining wall, approach slabs, and the rubbing down.

The work started last summer and was continued through the open winter, the Etobicoke bridge being opened for traffic in January, 1919, and the Bronte bridge in February, 1919.

No report has been made by the commission regarding the final cost of these bridges, as the work is not absolutely



FORMS IN PLACE FOR FLOOR SYSTEM OF THE MIMICO BRIDGE

complete and final adjustments with the contractors have not been effected. The contract price for the Etobicoke bridge, however, was \$18,900, and for the Bronte bridge, about \$22,000, although certain authorized changes in the plans were made after letting the Bronte contract and these will somewhat increase the cost of that bridge.

The foundations for the abutments for the bridges varied considerably. The Mimico abutments were of mass concrete, carried to rock. The rock was near the surface on the west side, so the excavation and cofferdam were light and no difficulty was experienced. The site of the east abutment was excavated by clam-shell and some difficulty was experienced with the cofferdam.

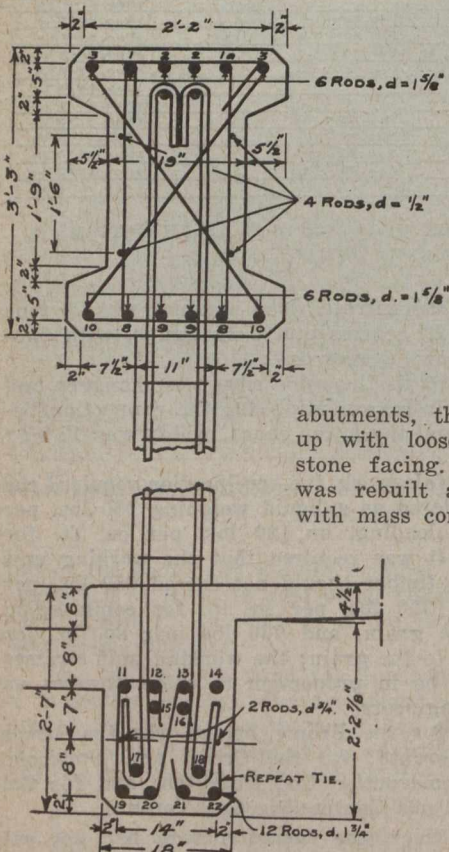


FIG. 5—SECTION THROUGH TOP AND BOTTOM CHORDS AT CENTRE OF BRONTE BRIDGE, SHOWING REINFORCING AND HANGERS

The concreting of the abutments was effected by chuting the concrete directly into place from the mixer, which was placed on the bank above.

At Etobicoke it was found on opening up the site to extend the existing stone abutments, that they were built up with loose filling behind the stone facing. The stone facing was rebuilt and was backed up with mass concrete.

On the abutments special provision was made for the reception of the main chords of the bridge by pouring solid blocks of concrete, the full thickness of the abutment. Expansion was provided for on one abutment of each bridge by anchoring a $\frac{3}{4}$ -in. steel plate on the abutment, separ-

ated from a similar plate affixed to the springing, by a sheet of brass to prevent rust and adhesion, with heavy grease lubrication to minimize friction and to ease movement.

At Port Credit and Bronte the rock was found 30 to 40 ft. below water level. Timber piles were driven to rock and mass concrete abutments built up, from below water level.

Some difficulty was experienced at the west abutment at Port Credit, owing to the presence of an old timber crib. The timber piles had to be driven through the crib. It was difficult to keep the water level down in the cofferdam, and powerful pumps were employed.

A special feature was devised to avoid the settlement that often takes place in the soil back-filled at the abutments. A reinforced concrete slab was constructed, spanning from the abutments to the undisturbed roadway, thus ensuring an even surface connection between the roadway and the bridge decking. The backfilling was rammed with water and made as solid as possible, and gives considerable support to the approach slab. The reinforced concrete naturally distributes the concentrated loads over a large area.

The contract for the bridges included in all cases the approaches, which were constructed in concrete to conform with the highway. No paving had previously been constructed for some distance at either side of each of the four bridges, owing to the possibility of settlement in the road-bed. The contracts for the bridges included the paving of the approaches. These bridges replace old steel structures that had only 16 ft. roadways and that were unsafe for present-day loads.

The bridges were designed for the Toronto-Hamilton Highway Commission by L. G. Mouchel & Partners, Ltd.,

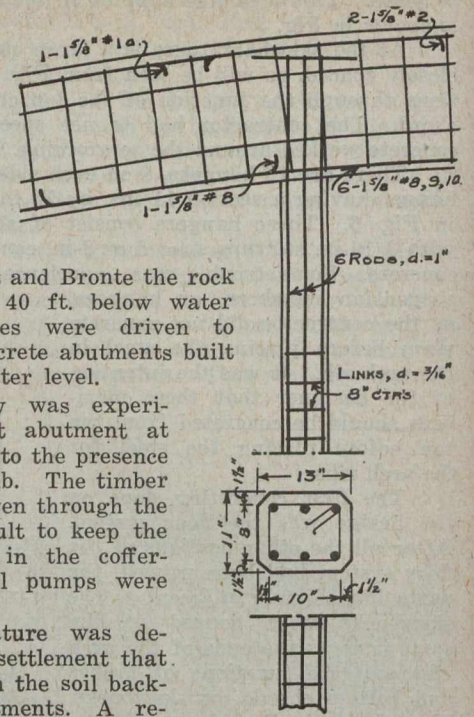
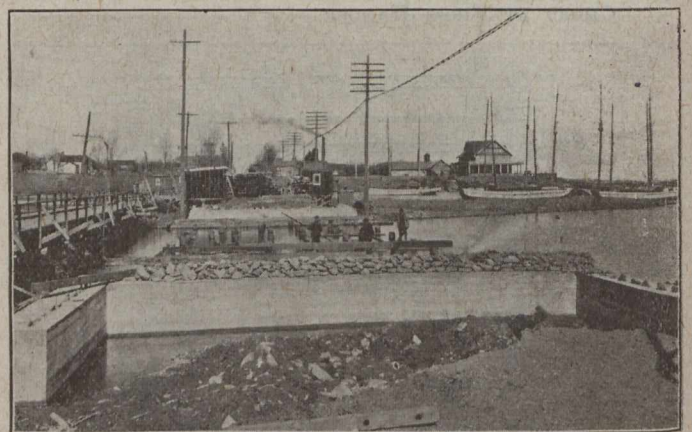


FIG. 6
PORTION OF TOP CHORD AND ONE HANGER, SHOWING SPACING OF STIRRUPS AND SECTION THROUGH HANGER



ABUTMENTS BUILT AND PILES DRIVEN READY TO BEGIN WORK ON SUPERSTRUCTURE OF THE CREDIT BRIDGE

which firm is now known as F. G. Engholm & Partners, Ltd., representatives for Canada of the "Hennebique System of Ferro-Concrete Construction," and the plans for the bridges state that they are "Hennebique System." The bridges are particularly interesting as being the first examples of bridge construction of this type in Canada according to this system.